

APPENDIX A

The Catena Group 2012 Updated Mussel Survey Report

Freshwater Mussel Survey Report Update

Monroe Bypass

(STIP No. R-3329/R-2559)

Mecklenburg and Union Counties, NC

Prepared for:

ATKINS

Atkins
5200 77 Center Dr., STE 500
Charlotte, NC 28217

PREPARED BY:



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October 26, 2012

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1.0 INTRODUCTION & BACKGROUND

The North Carolina Turnpike Authority (NCTA) proposes construction of the Monroe Bypass on new location from I-485 near Indian Trail, NC, to US 74 just west of Marshville, NC (Figure 1). Project construction will impact streams within the Rocky River Subbasin of the Greater Yadkin-Pee Dee River Basin, and potentially the headwaters of Four Mile Creek within the Sugar Creek Subbasin of the greater Catawba River Basin. The Federally Endangered Carolina Heelsplitter (*Lasmigona decorata*) and the state Endangered/Federal Species of Concern (FSC) Atlantic Pigtoe (*Fusconaia masoni*), Carolina Creekshell (*Villosa vaughaniana*), and Savannah Lilliput (*Toxolasma pullus*), are known to occur in the Rocky River Subbasin. In addition to these species, there are several other rare freshwater mussel species that are known to occur in this portion of the Rocky River Subbasin: Eastern Creekshell (*Villosa delumbis*), Creeper (*Strophitus undulatus*), and Notched Rainbow (*Villosa constricta*). The Creeper is considered Threatened and the Notched Rainbow and Eastern Creekshell are considered Special Concern and Significantly Rare by North Carolina.

In 2009 the Catena Group, Inc. (Catena) conducted freshwater mussel surveys in all water bodies within the proposed alignment, as well as within select stream reaches that were lacking recent survey data within the proposed alignment and within the Future Land Use Study Area (FLUSA) identified by NCTA. The Carolina Heelsplitter was not found within any of the streams surveyed; however, it is known to occur within Goose/Duck Creek, which is within the FLUSA. The survey results, which are detailed in the July 21, 2009 Freshwater Mussel Survey Report indicated fairly diverse and robust freshwater mussel populations within South Fork Crooked Creek and Stewarts Creek in the vicinity of the project alignment, as well as in portions of Crooked Creek and Richardson Creek within the FLUSA. The Savannah Lilliput was found within the project crossing in the FLUSA. The U.S. Fish and Wildlife Service (USFWS) is in the process of developing an “Elevation to Candidate Species Status” package for this species to determine if it warrants formal listing as Threatened or Endangered in the future (John Fridell, USFWS Recovery Biologist, personal communication). In addition, the Center for Biological Diversity (CBD) recently petitioned the USFWS to list 404 aquatic species in the southeastern United States, including the Savannah Lilliput as either Threatened or Endangered under the Endangered Species Act (CBD 2010).

Since more than two years have passed since these surveys were completed, Catena was retained by Atkins to update mussel surveys for the Monroe Bypass.

2.0 MUSSEL SURVEY EFFORTS

In order to determine the location for the 2012 mussel surveys, the location of potential effects and/or impacts within the FLUSA were overlaid with streams identified during the 2009 surveys that contain a robust freshwater mussel that could potentially support the Carolina Heelsplitter.

Accordingly, South Fork Crooked Creek and Stewarts Creek in the vicinity of the project alignment, and portions of Crooked Creek and Richardson Creek were surveyed.

2.1. Mussel Survey Methodology

Survey locations were chosen based on mapping and pre-survey investigations as provided by NCTA, accessibility, and appropriate habitat for the target species as determined in the field.

Surveys were conducted by Catena personnel on the following dates; September 26, 2012 (Tim Savidge, Tom Dickinson, Chris Sheats, and Ivy Kimbrough), October 3-5, 2012 (Tim Savidge and Ivy Kimbrough), and October 18, 2012 (Tim Savidge and Nancy Scott).

Within the surveyed reaches, all habitat types (riffle, run, pool, slack-water, etc.) were sampled by a minimum of a two-person team. The survey team began at the downstream end of the survey reach and proceeded upstream with the team spread across the stream into survey lanes. A combination of visual, bathyscope (glass-bottom view buckets), and tactile methodologies were employed as appropriate. Upstream and downstream survey limits were recorded using a hand-help Garmin 12 or e-trex Vista GPS unit. Times searches were employed in each reach to provide a catch per unit effort (CPUE). Searches were also conducted for relict shells.

3.0 RESULTS

3.1. Within Alignment

3.1.1. South Fork Crooked Creek

South Fork Crooked Creek was evaluated in two sections; 1) from Unionville-Indian Trail Road (SR 1367) upstream approximately 580 feet and 2) from Rocky River Road (SR 1007) to 35.0652°N, -80.60031°W, approximately 1,000 feet below Secrest Shortcut Road (Figure 2).

1) Only approximately 580 feet of this section of South Fork Crooked Creek was surveyed in 2012 due to poor survey conditions. The stream channel ranged from 4 – 5 meters (13 – 16.5 ft) wide with approximately 2 meter (6 ft) high clay stream banks. Banks were unstable and significantly eroded. The surveyed reach consisted of mostly long pool and slow moving run habitat. Substrate was dominated by sand and hard-packed clay. The surrounding area consisted of a pasture and residences. There was a large amount of woody debris. Heavy accumulations of leaf pack and other organic material covered much of the substrate, making surveying difficult. A total of 8 Eastern Elliptio, 2 Variable Spike, and 1 Eastern Creekshell was found in 1.17 person hours of survey time (Table 1). In addition, the Asian Clam (*Corbicula fluminea*) was common and the aquatic snails *Physella* sp. and Two-ridged Rams Horn (*Helisoma anceps*) were also present.

Table 1. CPUE for Freshwater Mussels: South Fork Crooked Creek Section 1

Scientific Name	Common Name	Number	CPUE #/person hr
<i>Elliptio complanata</i>	Eastern Elliptio	8	6.84/hr
<i>Elliptio icterina</i>	Variable Spike	2	1.71/hr
<i>Villosa delumbis</i>	Eastern Creekshell	1	0.85/hr

2) The stream channel ranged from 4 – 8 meters (13 – 26 ft) wide with approximately 2 meter (6 ft) high clay banks. Banks ranged from unstable and scoured to more stable areas exhibiting only minor erosion and undercutting. The survey reach consisted of mostly long pool and slow moving run habitat with the occasional riffle areas where significant bedrock outcroppings were present. Substrate was dominated by sand, hard-packed clay, gravel, cobble, and silt with occasional slate bedrock outcropping. The surrounding landuse was predominately cropland, with riparian buffers of varying width. A total of 1,125 Eastern Elliptio, 398 Variable Spike, 3 lanceolate Elliptio sp., 2 Eastern Floater, 4 Eastern Creekshell, 3 Carolina Creekshell, 15 Florida Pondhorn (*Uniomerus carolinianus*) and 12 Savannah Lilliput were found in 11.4 person hours of survey time (Table 2). Eleven of the 12 Savannah Lilliput were found in an approximately 10 meter (33 ft) section of the creek at 35.06540°N, -80.59915°W. The Asian Clam was common and the aquatic snails *Physella* sp. and Two-ridged Rams Horn were also present.

Table 2. CPUE for Freshwater Mussels: South Fork Crooked Creek Section 2

Scientific Name	Common Name	Number	CPUE #/person hr
<i>Elliptio complanata</i>	Eastern Elliptio	1,125	98.68/hr
<i>Elliptio icterina</i>	Variable Spike	398	34.91/hr
<i>Elliptio</i> sp	lanceolate elliptio species	3	0.26/hr
<i>Pyganadon cataracta</i>	Eastern Floater	2	0.18/hr
<i>Uniomerus carolinianus</i>	Florida Pondhorn	15	1.58/hr
<i>Villosa delumbis</i>	Eastern Creekshell	4	0.35/hr
<i>Villosa vaughaniana</i>	Carolina Creekshell	3	0.26/hr
<i>Toxolasma pullus</i>	Savannah Lilliput	12	1.05/hr

3.1.2. *Stewarts Creek*

In this downstream project crossing of Stewarts Creek (Figure 2), the stream channel ranged from 5 - 10 meters (16 – 33 ft) wide and stream banks ranged from 1 – 2 meters (3 – 6.5 ft) high. Banks ranged from stable to exhibiting some areas of erosion and undercutting. The surveyed reach sequenced from a rock fall riffle/run to a pool and slack water habitat often lined with bedrock outcroppings. Substrate was dominated by unconsolidated sand, angular cobble, and boulder, with areas of clay banks, silt, gravel, and bedrock. The surrounding area consisted of a moderate to wide forested buffer to poultry houses, and a utility corridor. A total of 17 Eastern

Elliptio, 6 Variable Spike and 7 Eastern Floater were located during 2.63 person-hours of survey time (Table 3). The Asian Clam was present.

Table 3. CPUE for Freshwater Mussels: Stewarts Creek

Scientific Name	Common Name	Number	CPUE #/person hr
<i>Elliptio complanata</i>	Eastern Elliptio	17	6.46/hr
<i>Elliptio icterina</i>	Variable Spike	6	2.28/hr
<i>Pyganadon cataracta</i>	Eastern Floater	7	2.66/hr

3.2. Additional Area Mussel Survey Results

Additional mussel surveys were conducted outside of the project study corridor in the best potential mussel habitats in the watersheds proposed to be impacted by the Monroe Bypass. The areas chosen for this effort were Richardson Creek upstream of the WWTP discharge facility and lower Crooked Creek, near its confluence with the Rocky River.

3.2.1. Richardson Creek

The additional mussel survey efforts in Richardson Creek were focused upstream of the Monroe WWTP discharge in the vicinity of the Walkup Road (SR 1106) crossing (Figure 2). In this section, Richardson Creek ranged from 12-15 meters (39 – 50 ft) wide with approximately 2 meter (6 ft) high stream banks. Banks generally exhibited some areas of erosion and undercutting, but were stabilized in areas with bedrock outcroppings. The surveyed reach mostly consisted of long shallow pool and slow moving run habitat punctuated with shallow gravel riffle areas. In order of dominance, substrate consisted of cobble, gravel, clay banks, silt, boulder, and bedrock. The surrounding area consisted of a narrow to moderate natural buffer to residential/commercial areas and road. Large accumulations of leaf pack were present in some areas making surveying difficult, and a Beaver dam has been constructed in the upper limits of this survey reach. A total of 216 Eastern Elliptio, 15 Variable Spike, 2 lanceolate *Elliptio* sp., 12 Eastern Floater, 10 Florida Pondhorn, 10 Eastern Creekshell, 3 Carolina Creekshell, and 1 Paper Pondshell (*Utterbackia imbecellis*) were found in 7.00 person hours of survey time (Table 4). In addition, the Asian Clam the aquatic snails Two-ridged Rams Horn, Marsh Rams-horn (*Planorbella trivolvis*), a Physid (*Physella* sp.) and Pointed Campeloma (*Campeloma decisum*) were present.

Table 4. CPUE for Freshwater Mussels: Richardson Creek Additional Area

Scientific Name	Common Name	Number	CPUE #/person hr
<i>Elliptio complanata</i>	Eastern Elliptio	216	30.86/hr
<i>Elliptio icterina</i>	Variable Spike	15	2.14/hr
<i>Elliptio</i> sp.	lanceolate elliptio species	2	0.29/hr
<i>Pyganadon cataracta</i>	Eastern Floater	12	1.71/hr
<i>Unio merus carolinianus</i>	Florida Pondhorn	10	1.43/hr
<i>Villosa delumbis</i>	Eastern Creekshell	10	1.43/hr

<i>Villosa vaughaniana</i>	Carolina Creekshell	3	0.43/hr
<i>Utterbackia imbecellus</i>	Paper Pondshell	1	0.14/hr

3.2.2. Crooked Creek

The additional mussel survey efforts in Crooked Creek watershed were focused on the last several miles of the main stem of Crooked Creek from its confluence with Rocky River to the vicinity of Brief Road (SR 1547) (Figure 2). In this section, Crooked Creek ranged from 12 – 20 meters (39 – 65.5 ft) wide with approximately 0.5 – 2 meter (1.5 – 6.5 ft) high and mostly stable clay stream banks. The entire reach consisted of a relatively high gradient sequence of riffle/run to pool habitats marked by a dominance of slate bedrock that provided grade control and stability throughout. In order of dominance, substrate consisted of angular cobble, bedrock, gravel, boulder, sand, clay, and silt. The stream reach was surrounded by an extensive hardwood forest that buffers the area’s mostly agricultural land use.

Crooked Creek was evaluated in three sections 1) from its confluence with Rocky River to 35.16088°N, -80.45517°W, 2) from 35.14651°N, -80.47060°W to 35.14168°N, -80.47370°W, and 3) from NC 218 up to 35.13177°N, -80.49202°W.

- 1) Heavy accumulations of leaf pack covered much of the substrate, making surveying difficult. A total of 7 Eastern *Elliptio* were found in 1.40 person hours of survey time (Table 5).

Table 5. CPUE for Freshwater Mussels: Crooked Creek Additional Area 1

Scientific Name	Common Name	Number	CPUE #/person hr
<i>Elliptio complanata</i>	Eastern <i>Elliptio</i>	7	5/hr

- 2) A total of 85 Eastern *Elliptio*, 16 Variable Spike, 23 Florida Pondhorn, 15 Eastern Creekshell, and 13 Carolina Creekshell were found in 12.00 person hours of survey time (Table 6). In addition, the Asian Clam and the aquatic snails Two-ridged Rams Horn and Pointed *Campeloma* were present.

Table 6. CPUE for Freshwater Mussels: Crooked Creek Additional Area 2

Scientific Name	Common Name	Number	CPUE #/person hr
<i>Elliptio complanata</i>	Eastern <i>Elliptio</i>	85	7.08/hr
<i>Elliptio icterina</i>	Variable Spike	16	1.33/hr
<i>Unio merus carolinianus</i>	Florida Pondhorn	23	1.92/hr
<i>Villosa delumbis</i>	Eastern Creekshell	15	1.25/hr
<i>Villosa vaughaniana</i>	Carolina Creekshell	13	1.08/hr

- 3) A total of 20 Eastern *Elliptio*, 4 Variable Spike, and 2 Florida Pondhorn were found in 1.50 person hours of survey time (Table 7). In addition, the Asian Clam and the aquatic snails Two-ridged Rams Horn and Pointed *Campeloma* were present.

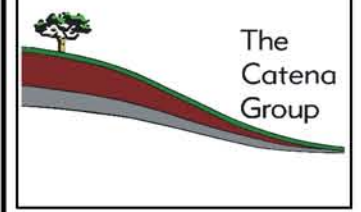
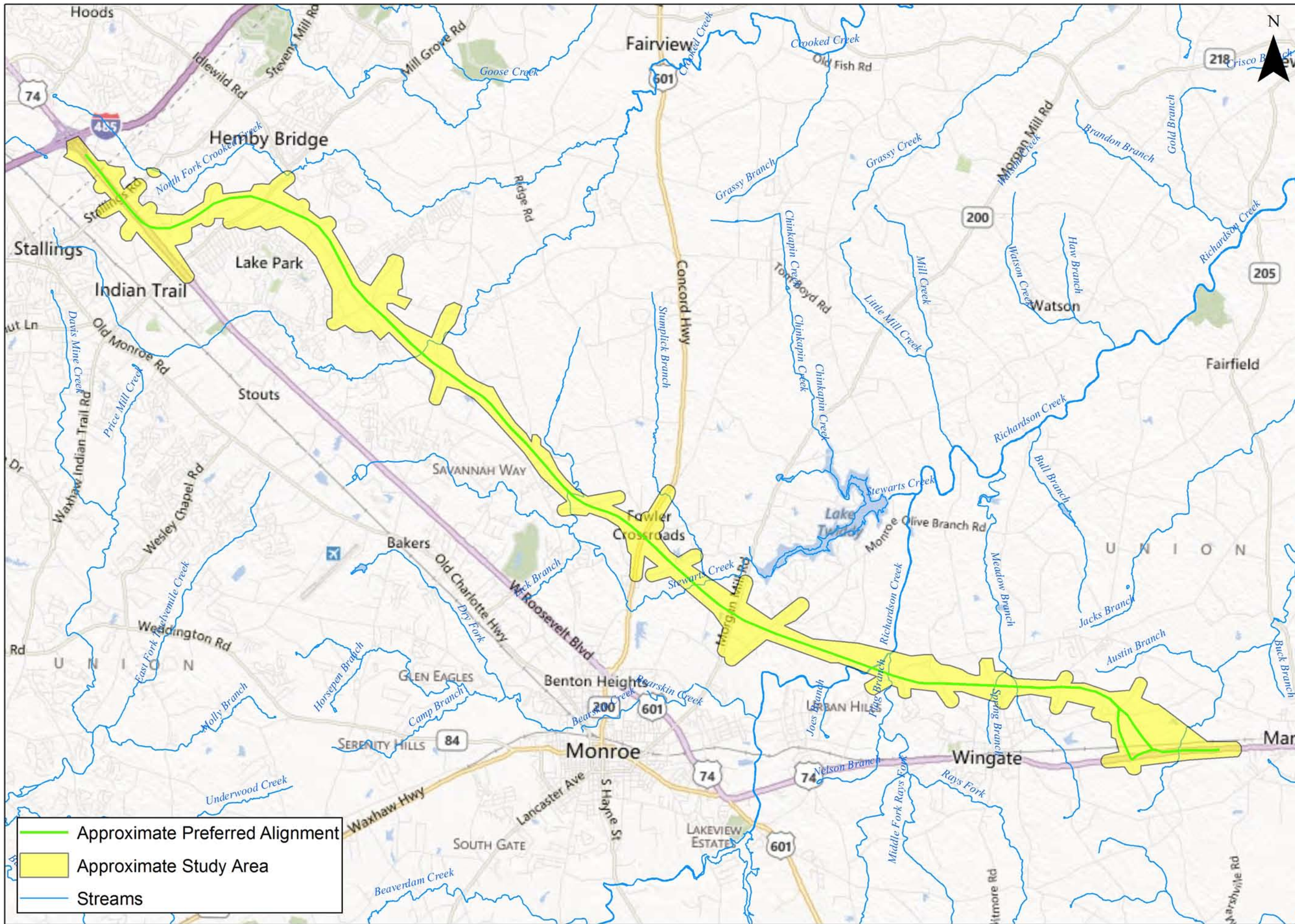
Table 7. CPUE for Freshwater Mussels: Crooked Creek Additional Area 3

Scientific Name	Common Name	Number	CPUE #/person hr
<i>Elliptio complanata</i>	Eastern Elliptio	20	13.33/hr
<i>Elliptio icterina</i>	Variable Spike	4	2.67/hr
<i>Unio merus carolinianus</i>	Florida Pondhorn	2	1.33/hr

3.3. Mussel Survey Discussion

Catena conducted mussel surveys within the FLUSA for the proposed Monroe Bypass project in both 2009 and 2012. The streams identified during the 2009 surveys that contain a robust freshwater mussel fauna were reevaluated in 2012, because these streams could potentially support the Carolina Heelsplitter. Overall the results of the two survey efforts are very similar, and as was the case in 2009, the Carolina Heelsplitter was not found in any of the surveyed streams. In addition, the Savannah Lilliput remains extant in South Fork Crooked Creek, and like in 2009, a concentration of individuals was found within the proposed roadway crossing.

Differences between the two survey efforts are more likely a result of differences in time of year, survey conditions, and level of effort, rather than an indication of changes in mussel abundances. For example, while the Savannah Lilliput was found in low numbers (3 individuals) in Richardson Creek in 2009, it was not located in 2012, but is likely still present. As mentioned above, there was a large amount of leaf pack covering the substrate in 2012 generally making surveying difficult. This coupled with the very small size of the Savannah Lilliput (< 2 inches) is likely the reason it was not detected. The fact that most of the other species occurring in Richardson Creek were found in similar numbers further supports this assumption. Furthermore, the difficulty of detecting a species that is present in low numbers during in a one-time survey is highlighted by the fact that the Paper Pondshell was found (one individual) in Richardson Creek in 2012, but not in 2009, although it was known from the stream prior to 2009 (NCWRC Unpublished Aquatic Species Database).



Date: October 2012

Scale: 0 0.25 0.5 1 Miles

Job No.: 1161

Title: **Freshwater Mussel Surveys**
 Monroe Bypass (STIP R-3329 / R-2559)
 Study Area

Mecklenburg and Union Counties, North Carolina

Client:

ATKINS

Atkins

Figure
1



Date: October 2012

Scale: 0 0.5 1 2 Miles

Job No.: 1161

Title: **Freshwater Mussel Surveys**
Monroe Bypass (STIP R-3329 / R-2559)
Study Area




Mecklenburg and Union Counties, North Carolina

Client:

ATKINS

Figure **2**



 Approximate Study Area
 Approximate Preferred Alignment
 Survey Reach

APPENDIX B

ATKINS 2012 Plant Survey Report

To: file
From: Elizabeth Scherrer
CC: Christy Shumate
Date: October 1, 2012 (Revised 10/9/12)
Re: Surveys for Schweinitz's sunflower, Michaux's sumac, and Georgia aster at Monroe Bypass (STIP No. R-3329/R-2559) Revised Task Order 13F(E)

On September 17 through 21, Atkins scientists Elizabeth Scherrer and Jonathan Carr performed surveys for Schweinitz's sunflower (*Helianthus schweinitzii*), Michaux's sumac (*Rhus michauxii*), and Georgia aster (*Symphotrichum georgianum* or *Aster georgianus*) at the Monroe Bypass project site. The survey area consisted of all areas affected by the project, including ROW, utility relocations, borrow/fill site, staging areas, etc., to update the survey conducted in September and October 2007. Also included in the survey area were the three known locations of Schweinitz's sunflower near the project area with a 500-foot buffer. Since all sites for utility relocations were not known at the time of the surveys, extensions of the plant survey area were drawn along all intersections with existing roads for a distance of 1,000 to 1,500 feet and a width of 200 feet.

Previous to the field surveys, Atkins reviewed aerial photos of the affected area to identify possible habitat areas for the three species. Suitable habitat consists of roadsides, utility right-of-ways, field edges, and other areas that receive abundant sunlight and are infrequently but regularly maintained. A total of approximately 35 acres, or 13.5 miles of linear transects, were targeted for field surveys. Surveys were performed visually using systematic overlapping transects to cover all suitable habitat areas. No plants of any of the three species were found. The Biological Conclusion is No Effect.

Previous to the field surveys, Atkins scientists visited the known locations of Schweinitz's sunflower along Secret Shortcut Road to determine the local phenology of the species and to establish a search image. The two populations on the east side of the road appeared to be declining due to encroachment of shrubs and saplings. Four plants with 8 stems were found at the more northerly location, while 3 plants with 6 stems were seen at the more southerly location. In the powerline population east of Secret Shortcut Road, an estimated 17 plants with 60 stems were found. Maintenance in this right-of-way area appears to be more regular and timed to ensure survival and increase of Schweinitz's sunflower. Atkins scientists visited the site of a known location along Highway 601 just north of the project corridor, but did not find any plants. A known population of Georgia aster on Cunningham Lane in Union County was also visited where approximately 12 stems were found that were in the first stages of blooming.

**Schweinitz's Sunflower
Georgia Aster
Michaux's Sumac
Survey Area**

Monroe Connector/Bypass
(Garden Parkway)
R-3329 and R-2559
100030367

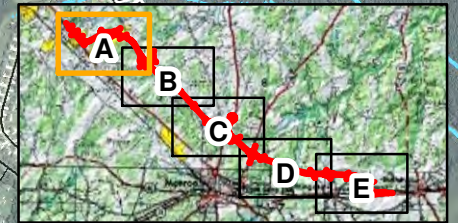
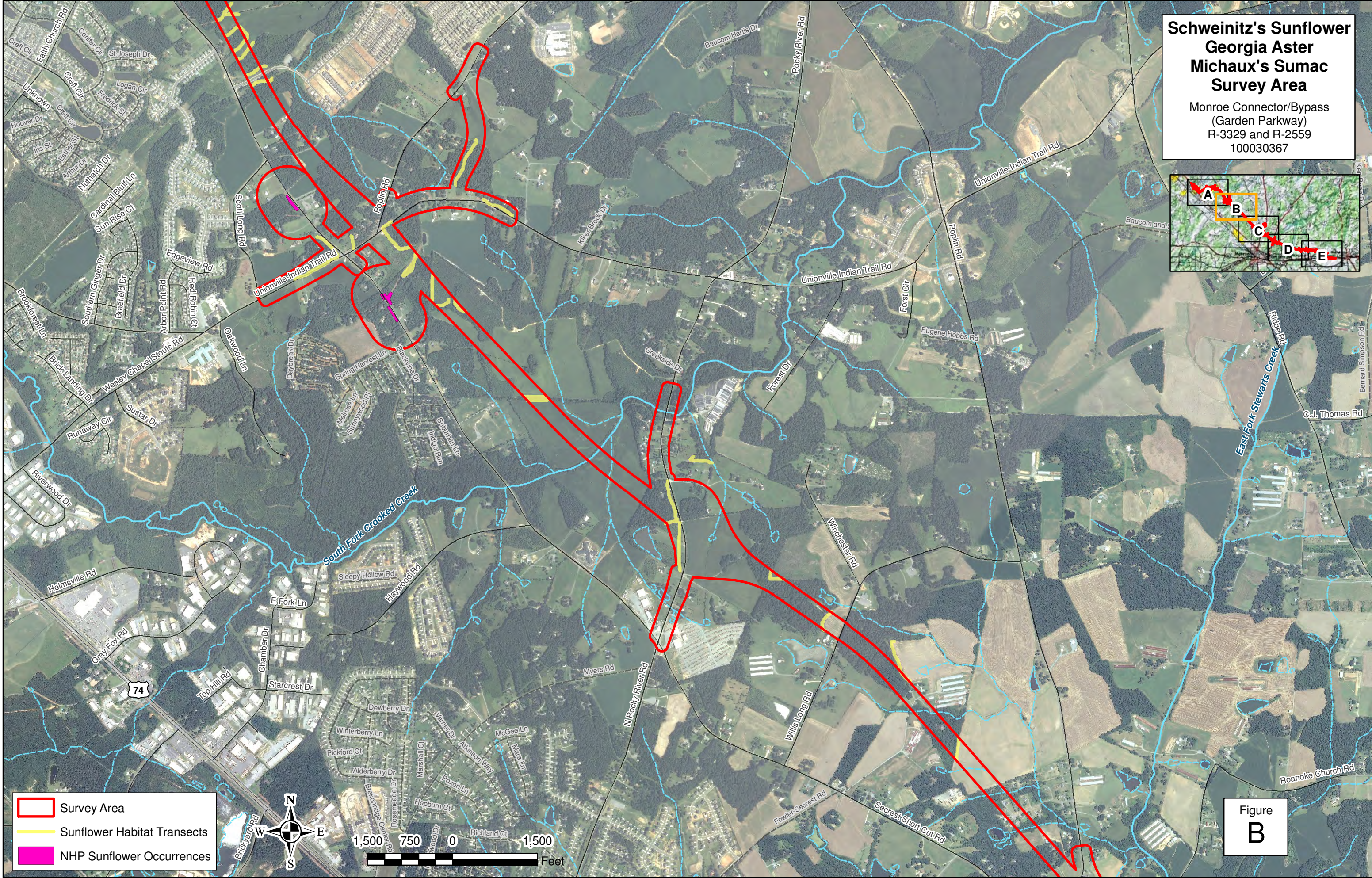
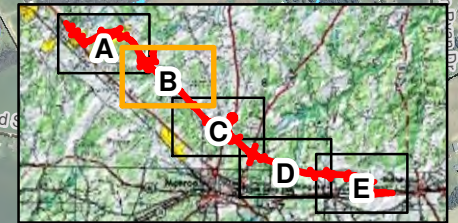


Figure
A

**Schweinitz's Sunflower
Georgia Aster
Michaux's Sumac
Survey Area**

Monroe Connector/Bypass
(Garden Parkway)
R-3329 and R-2559
100030367

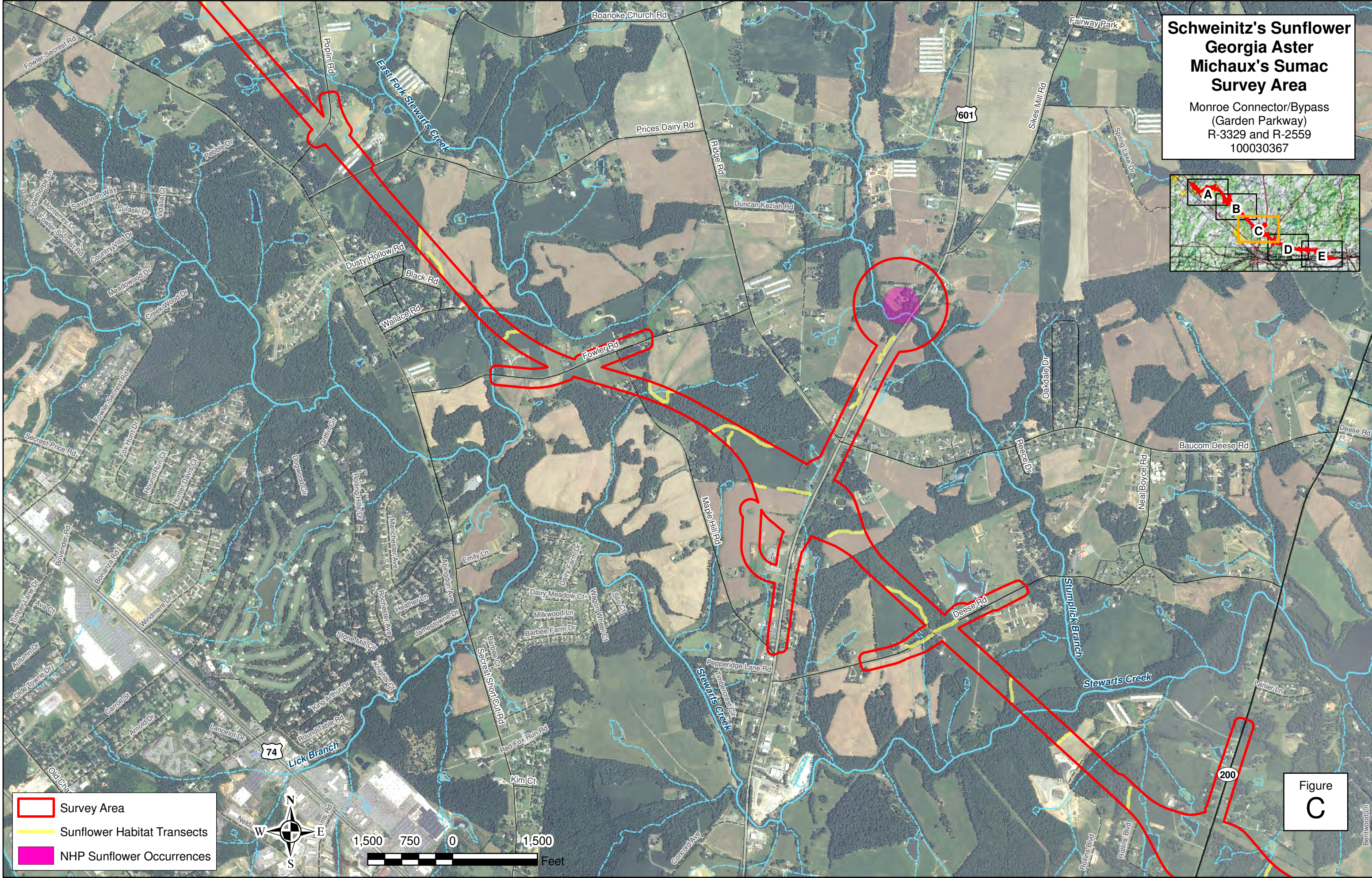
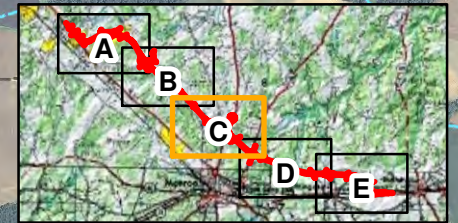


- Survey Area
- Sunflower Habitat Transects
- NHP Sunflower Occurrences

Figure
B

**Schweinitz's Sunflower
Georgia Aster
Michaux's Sumac
Survey Area**

Monroe Connector/Bypass
(Garden Parkway)
R-3329 and R-2559
100030367



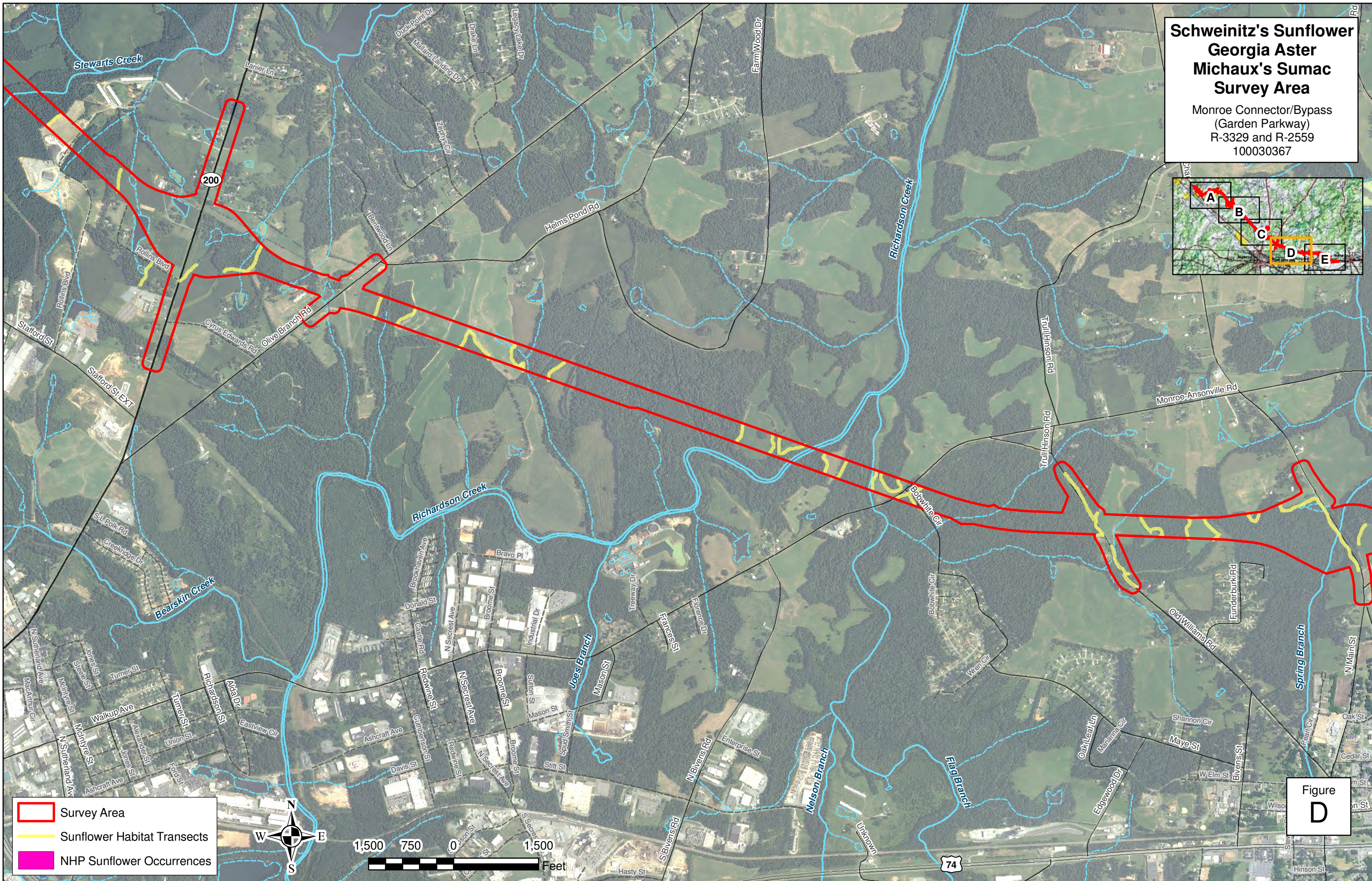
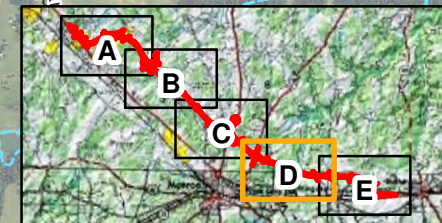
- Survey Area
- Sunflower Habitat Transects
- NHP Sunflower Occurrences



Figure
C

Schweinitz's Sunflower Georgia Aster Michaux's Sumac Survey Area

Monroe Connector/Bypass
(Garden Parkway)
R-3329 and R-2559
100030367






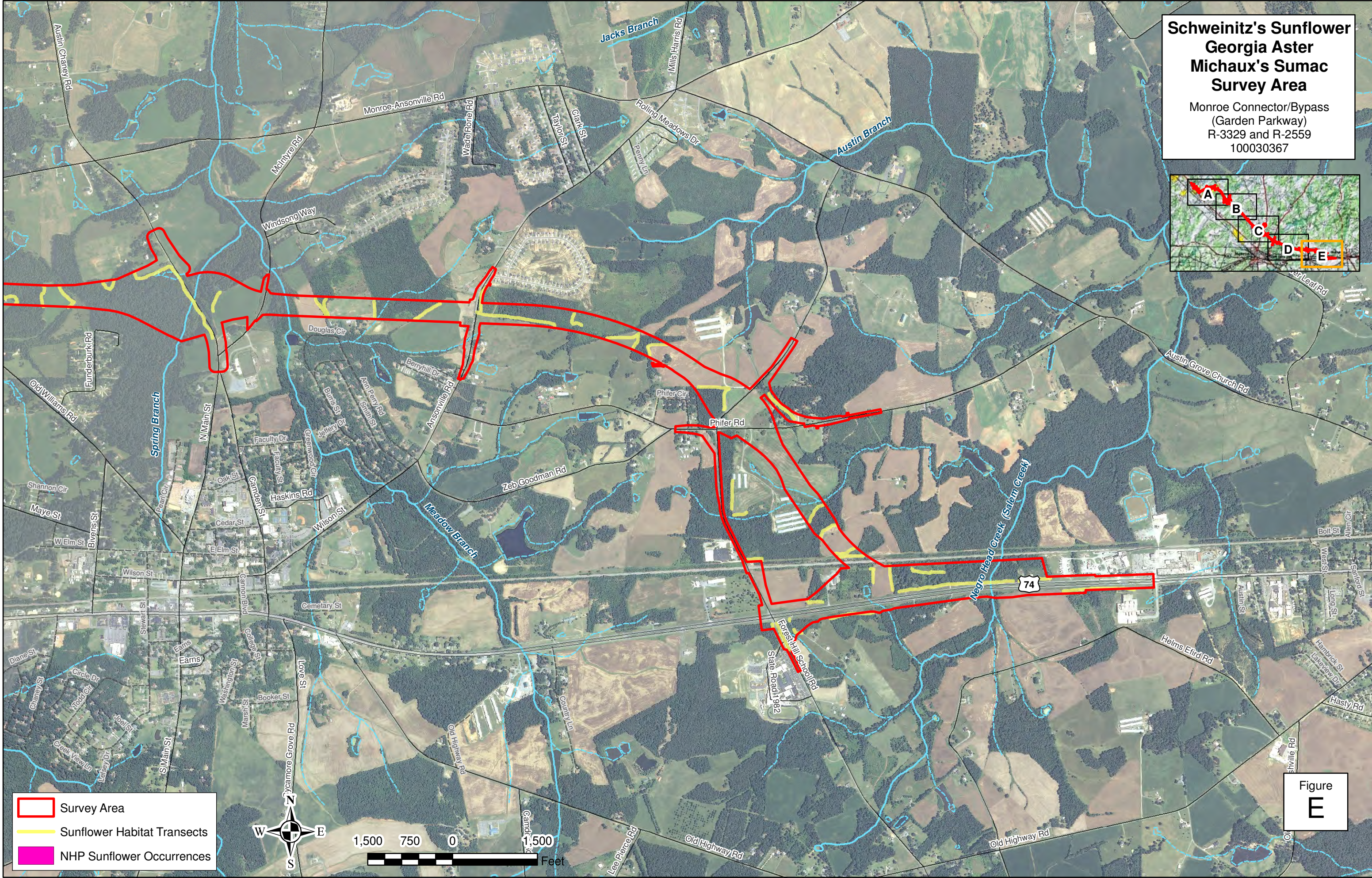
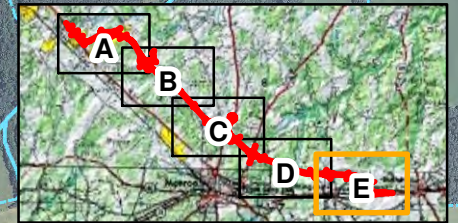
-  Survey Area
-  Sunflower Habitat Transects
-  NHP Sunflower Occurrences

Figure
D

**Schweinitz's Sunflower
Georgia Aster
Michaux's Sumac
Survey Area**

Monroe Connector/Bypass
(Garden Parkway)
R-3329 and R-2559
100030367



- Survey Area
- Sunflower Habitat Transects
- NHP Sunflower Occurrences



Figure
E

APPENDIX C

Conservation Measure Funding



NC Department of Transportation
 1514 Mail Service Center
 Raleigh, NC 27699-1514

Phone: 919-733-3624 x354
 Fax: 919-733-9247
 Internet: www.ncdot.org

Warrant: 2967460

ENVIRONMENTAL BANC & EXCHANGE
 10055 RED RUN BLVD, STE 130
 OWINGS MILL MD 21117

Payment No.: 2001675228
 Warrant Date: 10/05/2010
 Vendor No.: 17096

Page: 1 of 1

Invoice Number	Invoice Date	DOT Tracking # Remarks	PO/Contract #	Gross Invoice Amount*	Discount	Net Amount*
HS-PH1-1	08/04/2010	5200916126 Check Total.....	6300025121	150,000.00	0.00	150,000.00 \$150,000.00
DETACH FROM CHECK AND KEEP FOR YOUR RECORDS						

Cashed 10/13/10

* Includes unplanned freight, if applicable



NC Department of Transportation
 1514 Mail Service Center
 Raleigh, NC 27699-1514

66-1059
531

Warrant 2967460
 Date 10/05/2010
 Void after One Year

PAY TO THE
ORDER OF

\$ 150,000.00

ENVIRONMENTAL BANC & EXCHANGE
 10055 RED RUN BLVD, STE 130
 OWINGS MILL MD 21117

(\$ > > > 150,000.00)

&%1B\$(10100XA

State Treasurer, Raleigh, North Carolina
 Payable at Par Through Federal Reserve System

Mark L. Foster
 Chief Financial Officer

029674600 T053110594T 5V000V6010

INVOICE

5200916126

North Carolina Turnpike Authority
Attn: Leslie Schuck
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612

August 4, 2010
Invoice - HS-PH1-1
Job - 711-SC02-065
GL - 02-902-711-430065

63-25121

V-17096

Carolina Heelsplitter Conservation Bank:

	Units	Cost Per Unit	Invoice Amount
Item 1 - Carolina Heelsplitter Mussel Credits	25 0000	\$ 6,000 00	\$ 150,000 00
TOTALS			\$ 150,000 00

Kindly submit a check in the amount of \$150,000.00 for 25 0000 Carolina Heelsplitter Mussel Credits

Please make check payable to

Environmental Banc & Exchange, LLC
10055 Red Run Blvd., Ste. 130
Owings Mills, MD 21117

ok Aug

559100003.

Gaston 34922 1.TA1	0
Monroe 34533 1 TA1	150,000.00
Triangle Pkwy 39942 1.TA1	0
Cape Fear 40114 1 TA1	0
Mid Currituck 34470 1.TA1	0
Western Wake 35520.1 TA1	0



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

REQUEST FOR COMMODITY/SERVICE PROCUREMENT

V-17096

DATE: August 12, 2010

TO: State Purchase & Contract Office
Statewide IT Procurement Office (Choose One)

FROM: Eugene A. Conti, Jr.
NCDOT Secretary *EAC*

THRU: NCDOT Using Agency: North Carolina Turnpike Authority
Requestor: Steve DeWitt *Steve DeWitt*

Requested Commodity/Service: Carolina Heelsplitter Mussel Credits - 25 credits @ \$6,000 each

Justification of Procurement: We have received the approval the US Department of the Interior Fish and Wildlife Service for our proposed conservation measures with regards to the Monroe connector/Bypass project - please see attached letter.

Source of Funding: Monroe Connector/Bypass - 34533.1 TA1

Requested Amount: \$ 150,000.00

Comments: _____

*OK
G
8 Sept 10*

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PURCHASING SECTION
1510 MAIL SERVICE CENTER
RALEIGH, NC 27699-1510

TELEPHONE: 919 733-7101
FAX 919-733-8743
WEBSITE: WWW.NCDOT.GOV

LOCATION:
401 OBERLIN ROAD
SUITE 250
RALEIGH, NC 27805



STATE OF NORTH CAROLINA
TURNPIKE AUTHORITY

BEVERLY E. PERDUE
GOVERNOR

1578 MAIL SERVICE CENTER, RALEIGH, N C 27699-1578

DAVID W. JOYNER
EXECUTIVE DIRECTOR

Memorandum

To: File

From: Christy Shumate, AICP – NCTA-GEC

Subject: Conservation Measures for Carolina Heelsplitter Related to the Monroe Connector/Bypass Project

Date: May 25, 2010

The purpose of this memo is to document NCTA's decision process with regards to proposed conservation measures for the federally-endangered Carolina heelsplitter related to the Monroe Connector/Bypass project.

During preparation of the Biological Assessment, NCTA, FHWA, and consultants discussed proposing conservation measures to support the "May Affect, Not Likely to Adversely Affect" conclusion for the Carolina heelsplitter. Conservation measures considered included:

- Limitations on construction-related activities within the Goose Creek and Sixmile Creek watersheds.
- Stormwater improvement projects in the Goose Creek watershed.

A draft Biological Assessment was submitted to USFWS for informal review and discussion on April 19, 2010. No conservation measures were proposed in the draft document. NCTA opted not to propose anything, but instead discuss with USFWS following their review of the draft document. USFWS provided comments on the draft Biological Assessment via email on May 11, 2010. These included the following comment:

"Based on the conclusion on page 62, specifically, "... levels of uncertainty inherent in ICE analyses, a "No Effect" determination cannot be concluded". Given the current status of the Carolina heelsplitter and its habitat within the Goose, Duck and Sixmile Creek watersheds, any effects resulting from these uncertainties could be significant to the Carolina heelsplitter. Also, Section 7(a)(1) of the Endangered Species Act requires federal agencies to go beyond just avoiding or minimizing adverse effects to federally-listed species by utilizing their authorities to further the purposes of the Act by carrying programs for the conservation of listed species. Accordingly, we believe that some form of conservation for heelsplitter should be considered to address this uncertainty. We would be happy to meet to discuss conservation banking opportunities or other possibilities for conservation."

In a phone conversation with USFWS representatives (Marella Buncick, Alan Ratzclaff, John Fridell) on May 14, 2010 at 1:00 PM, USFWS indicated their preferred conservation measure would be a monetary contribution to the Carolina Heelsplitter Conservation Bank. The mitigation bank is located in the Flat Creek watershed in Lancaster County, South Carolina and is managed by EBX. This watershed contains the most viable population of heelsplitter mussels. A monetary contribution could be used to

acquire additional easements within the watershed or for restoration or research within the existing bank. USFWS did not indicate an appropriate amount for this contribution.

Bruce Ellis, NCDOT-NEU, in a phone conversation on May 17, 2010, noted that NCDOT would support a monetary contribution to the Conservation Bank. Although the bank is out of state, it offers the best protection for the species as a whole. Mr. Ellis also stated that NCDOT has been funding water quality monitoring gauges in Goose and Waxhaw Creeks through a contract with USGS. The contract expires in June 2010, and Mr. Ellis suggested that the NCTA renew this contract as part of the Monroe Connector/Bypass project. He estimated the cost to be approximately \$10,000-12,000 per year for 5 years for a total of \$50,000-60,000.

In determining an appropriate amount for a monetary contribution to the Conservation Bank, NCTA considered direct and indirect impacts in Goose and Sixmile Creek watersheds from the project, direct impacts in other watersheds, average land value in Lancaster County, South Carolina, and the Bank's credit pricing schedule, as follows:

- The project does not have direct impacts in Goose Creek or Sixmile Creek watersheds. Based on Baker's Indirect and Cumulative Effects Quantitative Analysis (April 2010), the project does not contribute indirect effects to these watersheds.
- The project would result in approximately 23,083 linear feet of stream impacts (10,353 linear feet perennial and 12,729 linear feet intermittent) and 8.1 acres of wetlands.
- Average cost of undeveloped land in Lancaster County, South Carolina was estimated based on a web search of acreage for sale (see summary in Attachment). This cost is estimated to be \$4,530 per acre.
- The Conservation Bank offers credits for impacts to riparian buffers and impervious surface creation. The price per credit is \$6,000 (see Attachment).

The following assumptions were used to determine a reasonable number of credits that the project might require (if in a protected watershed). These assumptions were used to provide an estimate of an appropriate monetary contribution only – the project does not require purchase of any credits. Based on the anticipated direct impacts of the project (see assumptions in Attachment), approximately 25 credits would be appropriate. At a cost of \$6,000, this would result in a total contribution of \$150,000 to the Bank.

The Biological Assessment with request for concurrence on its biological conclusions was submitted to USFWS on May 25, 2010 for informal consultation under Section 7 of the Endangered Species Act. A response is expected from USFWS by June 30, 2010. The Biological Assessment included the following conservation measures to further ensure a conservative approach to the analysis of the project's impacts on this species and its habitat. (Section 8.6):

- if any construction staging, storage, refueling, borrow pit or spoil areas are to occur in the Goose Creek and Sixmile Creek watersheds, the NCTA will coordinate with the NCDOT DEO, USFWS, and the contractor to develop BMPs for each site to avoid and minimize the potential for adverse effects. Additionally, NCTA will follow NCDOT's Design Standards in Sensitive Watersheds for implementing erosion and sediment control BMPs along the entire project.
- NCTA is proposing to renew the funding of the USGS monitoring station at the US 601 crossing of Goose Creek in Union County.
- NCTA is proposing to provide funding to the Carolina Heelsplitter Conservation Bank in the Flat Creek watershed in Lancaster County, South Carolina in the amount of \$150,000 to support ongoing research and surveying efforts, as well as protect, manage, and monitor land in the conservation bank.

ATTACHMENT

Current land prices in Lancaster County, South Carolina (May 2010) based on real estate listings
(http://www.landwatch.com/South_Carolina_land_for_sale/Lancaster_County)

Acres	Asking Price	Avg Cost/Acre
140 @	399000 =	\$2850
2.1 @	19,500 =	\$9285
23.7 @	105000 =	\$4430
76 @	201400 =	\$2650
107 @	262150 =	\$2450
1 @	8000 =	\$8000
99 @	262350 =	\$2650
3 @	4000 =	\$1333
19 @	79000 =	\$4158
5.2 @	39000 =	\$7500

AVERAGE = \$4,530/ac

Conservation Bank Credits

<u>FWS Mitigation Credit Requirements per Acre</u>	<u>Credit:Impact Ratios</u>	
	Perennial	Intermittent
0-50' buffer encroachment	10:1	5:1
50'-100' buffer encroachment	5:1	2:1
100'-200' buffer encroachment	2:1	N/A
impervious surface creation	1.75:1	N/A

Using 5:1 ratio for perennial streams and assuming an average width of 10 feet:
 $10,353 \text{ feet} \times 10 \text{ feet} / 43560 \text{ sf/ac} \times 5 = 11.5 \text{ credits}$

Using 2:1 ratio for intermittent streams and assuming an average width of 10 feet:
 $12,729 \text{ feet} \times 10 \text{ feet} / 43560 \text{ sf/ac} \times 2 = 5.5 \text{ credits}$

Using 1:1 ratio for wetlands
8 ac = 8 credits

TOTAL = 25 credits



Environmental Banc & Exchange

OUR WORK

The Carolina Heelsplitter Conservation Bank

The Carolina Heelsplitter Conservation Bank is dedicated to preserving, enhancing, and restoring key parcels of land in target watersheds with viable populations of the Federally Endangered Carolina heelsplitter mussel. The Bank offers a creative, landscape scale solution to the preservation and recovery of this rare and endangered mussel species.

The service area of the Bank includes watersheds with known populations of the Carolina heelsplitter mussel in North and South Carolina. Credits may be purchased from the Bank and used to offset mitigation requirements associated with the Carolina heelsplitter mussel with the approval of federal, state and/or local agencies.

Regulatory considerations

A landowner or developer may need to mitigate for direct or indirect impacts to the Carolina heelsplitter mussel, or associated habitat, if one of the following applies to the project:

- Section 7 and Section 10 of the Endangered Species Act provides the U.S. Fish & Wildlife Service jurisdiction on projects which involve Federal monies, projects requiring a Federal permit, (such as a 404 permit from the U.S. Army Corp of Engineers), or projects covered by a Habitat Conservation Plan
- For projects in South Carolina within the Six Mile Creek watershed, Lancaster County Ordinance #963 (amended version of Ordinance #901) specifies mitigation requirements for the creation of impervious surface and/or impacts to riparian buffers.
- Situations where a project sponsor desires to eliminate the potential for liability from future impacts through a consultation with the U.S. Fish & Wildlife Service.
- State, county or local regulations and/or ordinances which may require mitigation for projects located in watersheds with known Carolina heelsplitter populations.

The Carolina Heelsplitter Mussel is Unique and Rare

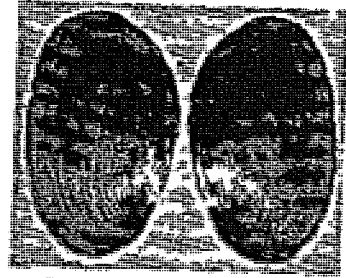
- Historically, the Carolina heelsplitter was estimated to have a distribution covering much of the Piedmont sections of the Savannah, Santee-Cooper, and Pee Dee river basins.
- Today the endemic Carolina heelsplitter mussel species is limited to a small area of the Piedmont within North and South Carolina,

To discuss how the Bank can assist you in meeting your compensatory requirements, please contact Randy Wilgis, randy@ebxusa.com
803-432-4890 (ofc)
410-236-5123 (cell)

We are glad to share our experiences in working out collaborative Heelsplitter mitigation solutions between local governments, regulatory agencies, and developers. Contact Randy Wilgis, randy@ebxusa.com

with small populations remaining in only 10 creek or headwater river watersheds.

- Habitat destruction due to silviculture, development, and agriculture has reduced and fragmented habitat.
- The Carolina heelsplitter historically served an important function in maintaining water quality in North and South Carolina. It was also an important component within aquatic food webs.



Pictured Above: Exterior Shell of the Carolina Heelsplitter

Conservation Bank Property is High-Quality Habitat

The initial phase of the Carolina Heelsplitter Conservation Bank encompasses approximately 810 acres of land and is situated adjacent to the Forty Acre Rock Heritage Preserve in Lancaster County. This property is located within the Flat Creek watershed, which has one of the most viable populations of the Carolina heelsplitter in the Carolinas. The Bank includes approximately 400 acres of riparian buffers which protect three major tributaries feeding into Flat Creek, and 25 acres of high quality wetlands. The Bank will incorporate a trust fund to support the ongoing research and surveying efforts to provide long term protection and re-establishment of the endangered Carolina heelsplitter, along with an endowment fund to protect, manage and monitor the land in perpetuity.

Carolina Heelsplitter Credit Purchasing Process

Credit calculation ratios for projects in the Six Mile Creek watershed in Lancaster County, SC can be found in County Ordinance #963. Per the ordinance, credits need to be acquired prior to release of the grading permit.

If your project is in North Carolina or in South Carolina outside of the Six Mile Creek watershed, the Bank will have a service area approved by U.S. Fish & Wildlife Service encompassing all of North and South Carolina but the use of credits from the Bank is subject to approval by state and local regulatory agencies.

To discuss how the Carolina Heelsplitter Conservation Bank can assist you in meeting your Carolina heelsplitter compensatory requirements, please contact Randy Wilgis with the Environmental Banc & Exchange. Randy can be reached at:

803-432-4890 (ofc)
410-236-5123 (cell)
randy@ebxusa.com

Company | Products & Services | Solutions | Alliances | Our Work | Knowledge Center

Environmental Banc & Exchange | phone: (888) 781-7075

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*hswyers
@USGS.gov.*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

6300026417

REQUEST FOR COMMODITY/SERVICE PROCUREMENT

#V-1873

DATE: September 14, 2010

(Choose One)

TO: State Purchase & Contract Office
Statewide IT Procurement Office

FROM: Eugene A. Conti, Jr.
NCDOT Secretary

EAC

THRU: NCDOT Using Agency: North Carolina Turnpike Authority

Requestor: David Joyner

DJ

Requested Commodity/Service: US Geological Survey data program for Waxhaw Creek (period of July 2010 thru June 2015) and Goose Creek (period of October 2010 thru September 2015) - \$75,100 each = \$150,200.00

Justification of Procurement: WUSGS program with the NCDOT for the operation and maintenance of the streamgaging station at: Goose Creek at Highway 601 near Fairview, NC (USGS station number 02124692) and Waxhaw Creek at SR 1103 near Jackson, NC (USGS station number 02147126) - Monroe Connector/Bypass project.

Source of Funding: Monroe Connector/Bypass - 34533.1.TA1

Requested Amount: \$ 150,200.00

Comments: _____

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PURCHASING SECTION
1510 MAIL SERVICE CENTER
RALEIGH, NC 27699-1510

TELEPHONE: 919-733-7101
FAX: 919-733-8743
WEBSITE: WWW.NCDOT.GOV

LOCATION:
401 OBERLIN ROAD
SUITE 250
RALEIGH, NC 27605



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
North Carolina Water Science Center
3916 Sunset Ridge Road
Raleigh, North Carolina 27607

RECEIVED

SEP 1 2010

DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

August 30, 2010

Mr. Bruce Ellis
NCDOT
Natural Environment Unit
1598 Mail Service Center
Raleigh, NC 27699-1598

Dear Bruce:

Thank you for your continuing support of U.S. Geological Survey data programs, which we conduct across North Carolina in cooperation with more than 30 local, State and Federal agencies.

Our program with the NCDOT for the operation and maintenance of the streamgaging station on Goose Creek at Highway 601 near Fairview, NC (USGS Station Number 02124692) for the period October 1, 2010 through September 30, 2015 is summarized in the table below.

Annual Operation Period	Annual Operation and Maintenance Costs
October 1, 2010 - September 30, 2011	\$ 14,300
October 1, 2011 - September 30, 2012	\$ 14,600
October 1, 2012 - September 30, 2013	\$ 15,000
October 1, 2013 - September 30, 2014	\$ 15,400
October 1, 2014 - September 30, 2015	\$ 15,800
TOTAL	\$ 75,100

Attached are four copies of the Joint Funding Agreement (JFA). Please have the enclosed JFA signed and return two copies to us before September 30, 2010. Regulations state that we cannot continue to work or start new work until we receive the signed agreement. Work performed with funds from this agreement will be conducted on a fixed-price basis. The results of all work under this agreement will be available for publication by the USGS.

Let us know if you have any questions about our program or if we can assist you in any other way. If you have any questions, please call me at (919) 571-4000 or Jerald "Boo" Robinson at (704) 3344,6272 etx. 11.

Sincerely,

A handwritten signature in cursive script that reads "Holly S. Weyers". The signature is written in black ink and is positioned below the word "Sincerely,".

Holly S. Weyers, Director
USGS North Carolina Water Science Center

cc: Jerald "Boo" Robinson, USGS, Charlotte Field Office

Form 9-1366
(Oct. 2005)

**U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement**

Page 1 of 2

Customer #: NC002
Agreement #: 11E4NC2510GOOSE
Project #: 2510-
TIN #: 53-0196958
Fixed Cost Agreement Yes No

**FOR
WATER RESOURCES INVESTIGATION**

THIS AGREEMENT is entered into as of the 30th day of August, 2010, by the U.S. GEOLOGICAL SURVEY, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, NATURAL ENVIRONMENTAL UNIT, party of the second part.

1. The parties hereto agree that subject to availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation the operation and maintenance of the streamgaging station on Goose Creek at Highway 601 near Fairview , NC (USGS Station Number 02124692), herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50; and 43 USC 50b.
2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) includes In-Kind Services in the amount of \$0.00.
 - (a) \$0.00 by the party of the first part during the period
October 1, 2010 to September 30, 2015
 - (b) \$75,100.00 by the party of the second part during the period
October 1, 2010 to September 30, 2015

(All are unmatched funds)

 - (c) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.
 - (d) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.
3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.
4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.
5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.
6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.
7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.

Form 9-1366
continued

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement

Customer #: NC002
Agreement #: 11E4NC2510GOOSE
Project #: 2510-
TIN #: 53-0196958

- 8. The maps, records, or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records, or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program and, if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at costs, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records, or reports published by either party shall contain a statement of the cooperative relations between the parties.
- 9. USGS will issue billings utilizing Department of the Interior Bill for Collection (form DI-1040). Billing documents are to be rendered quarterly. Payments of bills are due within 60 days after the billing date. If not paid by the due date, interest will be charged at the current Treasury rate for each 30 day period, or portion thereof, that the payment is delayed beyond the due date. (31 USC 3717; Comptroller General File B-212222, August 23, 1983).

U.S. Geological Survey
United States
Department of the Interior

NC Department of Transportation
Natural Environmental Unit

USGS Point of Contact

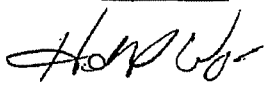
Customer Point of Contact

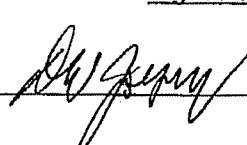
Name: Jerald "Boo" Robinson
Address: 810 Tyvola Road
Suite 108
Charlotte, NC 28217
Telephone: 704-3344-6272, ext. 11
Email: jbrobins@usgs.gov

Name: Bruce Ellis
Address: 1598 Mail Service Center
Raleigh, NC 27699-1598
Telephone: 919-715-1418
Email: bellis@dot.state.nc.us

Signatures

Signatures

By  Date 8/30/10
Name: Holly S. Weyers
Title: Director, NC Water Science Center

By  Date 9-19-10
Name: _____
Title: _____

By _____ Date _____
Name: _____
Title: _____

By _____ Date _____
Name: _____
Title: _____

By _____ Date _____
Name: _____
Title: _____

By _____ Date _____
Name: _____
Title: _____



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
North Carolina Water Science Center
3916 Sunset Ridge Road
Raleigh, North Carolina 27607

June 22, 2010

RECEIVED

JUN 24 2010

DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

Mr. Bruce Ellis
NCDOT
Natural Environment Unit
1598 Mail Service Center
Raleigh, NC 27699-1598

Dear Bruce:

Thank you for your continuing support of U.S. Geological Survey data programs, which we conduct across North Carolina in cooperation with more than 30 local, State and Federal agencies.

Our program with the NCDOT for the operation and maintenance of the streamgaging station on Waxhaw Creek at SR 1103 near Jackson, NC (USGS Station Number 02147126) for the period July 1, 2010 through June 30, 2015 is summarized in the table below.

Annual Operation Period	Annual Operation and Maintenance Costs
July 1, 2010 - June 30, 2011	\$ 14,300
July 1, 2011 - June 30, 2012	\$ 14,600
July 1, 2012 - June 30, 2013	\$ 15,000
July 1, 2013 - June 30, 2014	\$ 15,400
July 1, 2014 - June 30, 2015	\$ 15,800
TOTAL	\$ 75,100

Attached are four copies of the Joint Funding Agreement (JFA). Please have the enclosed JFA signed and return two copies to us before June 30, 2010. Regulations state that we cannot continue to work or start new work until we receive the signed agreement. Our current JFA expires June 30, 2010. Work performed with funds from this agreement will be conducted on a fixed-price basis. The results of all work under this agreement will be available for publication by the USGS.

Let us know if you have any questions about our program or if we can assist you in any other way. If you have any questions, please call me or Jeanne Robbins at (919) 571-4001.

Sincerely,

Douglas A. Harned, Acting Director
USGS North Carolina Water Science Center

cc: Jerald "Boo" Robinson, USGS, Charlotte Field Office.

Form 9-1366
(Oct. 2005)

**U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement**

Customer #: NC002
Agreement #: 10E4NC2510
Project #: 2510-
TIN #: 53-0196958
Fixed Cost Agreement Yes No

Page 1 of 2

**FOR
WATER RESOURCES INVESTIGATIONS**

THIS AGREEMENT is entered into as of the 22nd day of June, 2010, by the U.S. GEOLOGICAL SURVEY; UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the NC DEPARTMENT OF TRANSPORTATION, NATURAL ENVIRONMENT UNIT, party of the second part.

1. The parties hereto agree that subject to availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation for the operation and maintenance of the streamgaging station on Waxhaw Creek at SR 1103 near Jackson, NC (USGS Station Number 02147126), herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50; and 43 USC 50b.
2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) includes In-Kind Services in the amount of \$0.00.

(a) \$0.00 by the party of the first part during the period
July 1, 2010 to June 30, 2015

(b) \$75,100.00 by the party of the second part during the period
July 1, 2010 to June 30, 2015

(All unmatched funding)

- (c) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.
- (d) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.
3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.
4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.
5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.
6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.
7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.

Form 9-1366
continued

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement

Customer #: NC002
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Project #: 2510-
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- 9. USGS will issue billings utilizing Department of the Interior Bill for Collection (form DI-1040). Billing documents are to be rendered quarterly. Payments of bills are due within 60 days after the billing date. If not paid by the due date, interest will be charged at the current Treasury rate for each 30 day period, or portion thereof, that the payment is delayed beyond the due date. (31 USC 3717; Comptroller General File B-212222, August 23, 1983).

U.S. Geological Survey
United States
Department of the Interior

NC Department of Transportation
Natural Environment Unit

USGS Point of Contact

Name: Jeanne C. Robbins
Address: 3916 Sunset Ridge Road
Raleigh, NC 27607
Telephone: 919-571-4017
Email: jrobbins@usgs.gov

Customer Point of Contact

Name: Mr. Bruce Ellis
Address: 1598 Mail Service Center
Raleigh, NC 27699-1598
Telephone: 919-715-1418
Email: bellis@dot.state.nc.us

Signatures

Signatures

By Douglas A. Harned Date 6-22-2010
Name: Douglas A. Harned
Title: Acting Director, USGS NC Water
Science Center

By [Signature] Date 9-19-10
Name:
Title:

By _____ Date _____
Name:
Title:

By _____ Date _____
Name:
Title:

By _____ Date _____
Name:
Title:

By _____ Date _____
Name:
Title:

Form 9-1366
(Oct. 2005)

**U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement**

Customer #: NC002
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Fixed Cost Agreement Yes No

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WATER RESOURCES INVESTIGATIONS**

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Form 9-1366
continued

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement

Customer #: NC002
Agreement #: 10E4NC2510
Project #: 2510-
TIN #: 53-0196958

- 8. The maps, records, or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records, or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program and, if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at costs, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records, or reports published by either party shall contain a statement of the cooperative relations between the parties.
- 9. USGS will issue billings utilizing Department of the Interior Bill for Collection (form DI-1040). Billing documents are to be rendered **quarterly**. Payments of bills are due within 60 days after the billing date. If not paid by the due date, interest will be charged at the current Treasury rate for each 30 day period, or portion thereof, that the payment is delayed beyond the due date. (31 USC 3717; Comptroller General File B-212222, August 23, 1983).

U.S. Geological Survey
United States
Department of the Interior

NC Department of Transportation
Natural Environment Unit

USGS Point of Contact

Customer Point of Contact

Name: Jeanne C. Robbins
Address: 3916 Sunset Ridge Road
Raleigh, NC 27607
Telephone: 919-571-4017
Email: jrobbins@usgs.gov

Name: Mr. Bruce Ellis
Address: 1598 Mail Service Center
Raleigh, NC 27699-1598
Telephone: 919-715-1418
Email: bellis@dot.state.nc.us

Signatures

Signatures

By Douglas A. Harned Date 6-22-2010
Name: Douglas A. Harned
Title: Acting Director, USGS NC Water
Science Center

By [Signature] Date 9-19-10
Name:
Title:

By _____ Date _____
Name:
Title:

By _____ Date _____
Name:
Title:

By _____ Date _____
Name:
Title:

By _____ Date _____
Name:
Title:

Page 1 of 2

Form 9-1366
(Oct. 2005)

**U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement**

Customer #: NC002
 Agreement #: 11E4NC2510GOOSE
 Project #: 2510-
 TIN #: 63-0196958
 Fixed Cost Agreement Yes No

**FOR
WATER RESOURCES INVESTIGATION**

THIS AGREEMENT is entered into as of the 30th day of August, 2010, by the U.S. GEOLOGICAL SURVEY, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, NATURAL ENVIRONMENTAL UNIT, party of the second part.

1. The parties hereto agree that subject to availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation the operation and maintenance of the streamgaging station on Goose Creek at Highway 601 near Fairview, NC (USGS Station Number 02124692), herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50; and 43 USC 50b.
2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) includes In-Kind Services in the amount of \$0.00.

(a) \$0.00 by the party of the first part during the period
October 1, 2010 to September 30, 2015

(b) \$75,100.00 by the party of the second part during the period
October 1, 2010 to September 30, 2015

(All are unmatched funds)

- (c) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.
 - (d) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.
3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.
 4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.
 5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.
 6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.
 7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.

Form 9-1366
continued

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement

Customer #: NC002
Agreement #: 11E4NC2510GOOSE
Project #: 2510-
TIN #: 53-0196958

- 8. The maps, records, or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records, or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program and, if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at costs, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records, or reports published by either party shall contain a statement of the cooperative relations between the parties.
- 9. USGS will issue billings utilizing Department of the Interior Bill for Collection (form DI-1040). Billing documents are to be rendered quarterly. Payments of bills are due within 60 days after the billing date. If not paid by the due date, interest will be charged at the current Treasury rate for each 30 day period, or portion thereof, that the payment is delayed beyond the due date. (31 USC 3717; Comptroller General File B-212222, August 23, 1983).

U.S. Geological Survey
United States
Department of the Interior

NC Department of Transportation
Natural Environmental Unit

USGS Point of Contact

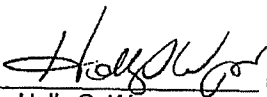
Customer Point of Contact

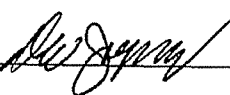
Name: Jerald "Boo" Robinson
Address: 810 Tyvola Road
Suite 108
Charlotte, NC 28217
Telephone: 704-3344-6272, ext. 11
Email: jbrobins@usgs.gov

Name: Bruce Ellis
Address: 1598 Mail Service Center
Raleigh, NC 27699-1598
Telephone: 919-715-1418
Email: bellis@dot.state.nc.us

Signatures

Signatures

By  Date 8/30/10
Name: Holly S. Weyers
Title: Director, NC Water Science Center

By  Date 9-19-10
Name: _____
Title: _____

By _____ Date _____
Name: _____
Title: _____

By _____ Date _____
Name: _____
Title: _____

By _____ Date _____
Name: _____
Title: _____

By _____ Date _____
Name: _____
Title: _____

APPENDIX D

**Union Power Cooperative
Schweinitz's Sunflower Restricted Sites Guidelines**

Understanding Reached With U.S. Fish and Wildlife Service Regarding Access Into Schweinitz Sunflower Restricted Sites Because of Union Power Cooperative Operations

Carrie Lorenz and Wil Ortiz will serve as the point of contact with the USFW to minimize misunderstandings and streamline the follow-up required.

- For Pre-Planned Activities- During the restricted access season of April 1st through November 15th, Union Power must make contact with Carolyn Wells at (828) 258-3939 ext 231 (Monday through Friday) between 8am and 5pm prior to work commencement. Zero can be pressed at any time to get to an operator or other co-worker. This applies if you need to cut a path to get to the equipment or require to introduce equipment into the sites. If you simply need to walk into the sites and no visual impact will be left then no contact is required. They want the opportunity to be able to move plants, if at all possible and necessary, to avoid being destroyed by Union Power activities.
- For Emergency Situations- Simply provide us with a map of the location highlighted. If warranted, we will submit report to the USFW regarding the access.
- Access During the Off-Season (November 16th through March 31st- no mowing or driving of vehicles that will compact the ground, create ruts, make holes, or in any way disturb the topsoil. Foot traffic is perfectly fine. Cutting of brush to access equipment is also permitted provided it's removed from the area.

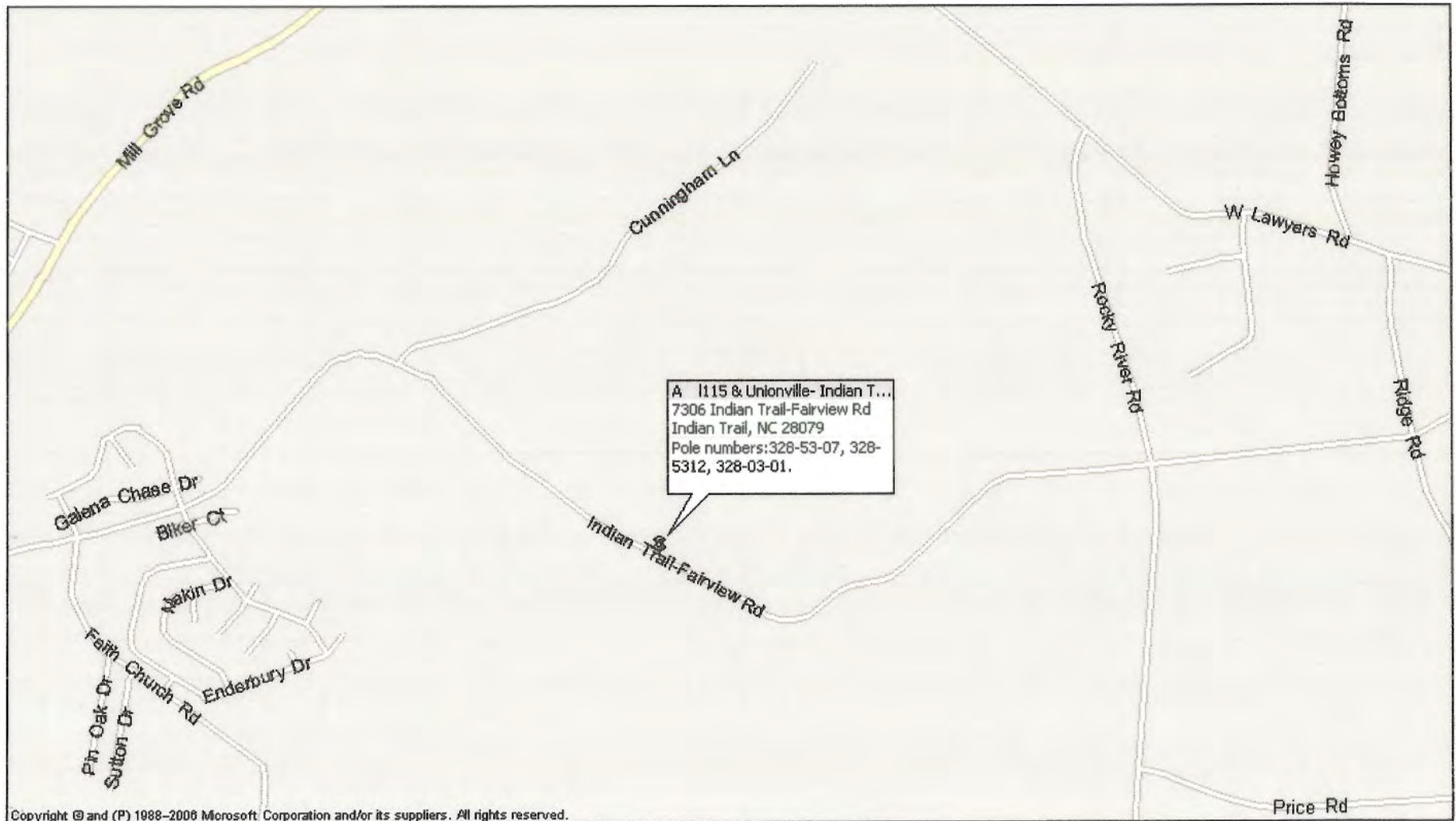
NCDOT Management Schweinitz's Sunflower Areas

Exact Locations of Sites NOT to MOW or Disturb within Utility ROWs

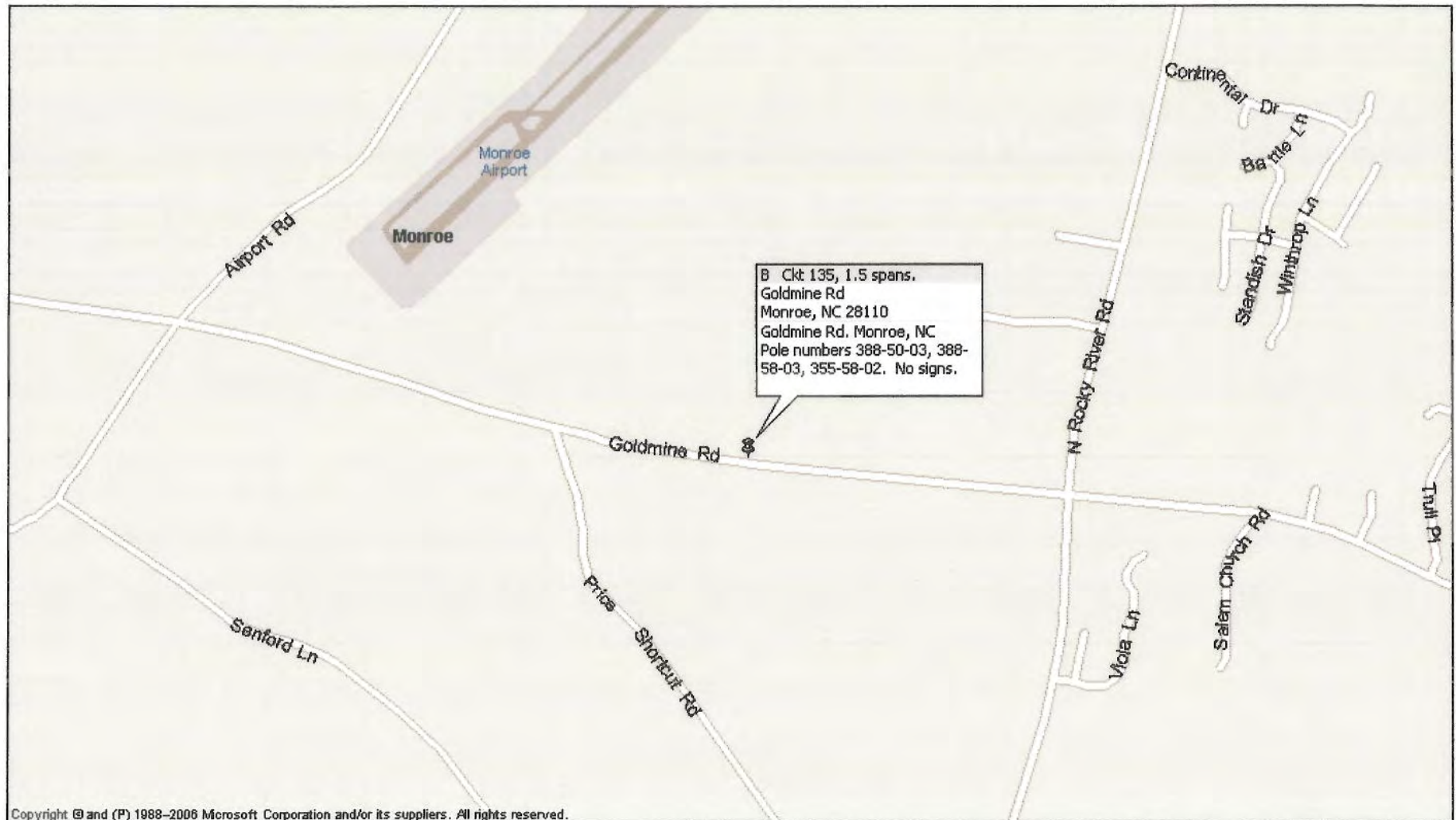
Location on Map	Address/Street	Circuit	Number of Spans	Pole Numbers	Notes
A	7306 Indian Trail-Fairview Rd	115 & Unionville-Indian Trail Transmission	4.5	328-53-07, 328-53-12, 328-03-01	
B	Goldmine Rd.	135	1.5	388-50-03, 388-58-03, 355-58-02	no signs
C	6616 Waxhaw Highway	152	1	446-29-03, 446-29-05	
D	6719 Waxhaw Highway	152	2	446-28-07, 446-28-06, 446-2804	
E	Waxhaw Highway & Western Union School Rd	152	3.5	446-27-02, 446-27-01, 446-28-08, 446-28-05,	
F	7623 Waxhaw Highway	152	6	445-40-08, 445-40-09, 445-40-01, 445-40-07, 446-33-05, 446-33-12, 446-33-03	There are 6 spans for sure, but there could be as many as 20 spans if some of the signs are missing.
G	3504 Waxhaw Marvin Rd	187	3	424-28-12, 424-27-11, 424-27-01, 424-19-02	Unsure if ROW is shared with DOT or not. Our lines don't follow the road exactly and there is a thin line of trees between road and lines.
H	9509 Marvin School Rd	188	0.25	403-07-02	no signs
I	9206 Joe Kerr Rd	188	1	383-63-03, 383-63-04	no signs
J	Miami Church Rd	71	2	171-64-04, 171-64-03, 171-64-02	
K	5485 Miami Church Rd	71	1.5	171-43-02, 171-43-08, 171-43-06	Lines shift away from DOT ROW and then merge back into same ROW again.
L	16301 Hwy 52 N	21	1.5	095-13-07, 095-13-08, 095-05-01	no signs
M	intersection of Wagoner Rd. & Hwy 52 N	21	2.5	095-05-01, 095-04-09, 095-04-03, 095-04-04	no signs, unsure if this is one of the spray areas or not
N	16093 Hwy 52 N	21	1	095-04-04, 095-04-05	no signs
O	15901 Hwy 52 N	21	1	075-59-02, 075-59-03	no signs
P	15585 Hwy 52 N	21	2	075-51-03, 075-51-02, 075-51-01	
Q	Old Beatty Ford Rd	21	1.5	075-42-03, 075-42-02, 075-42-01	

* note other sunflower areas are under Duke lines, if DOT would like to contact them as well, they are marked on the map.

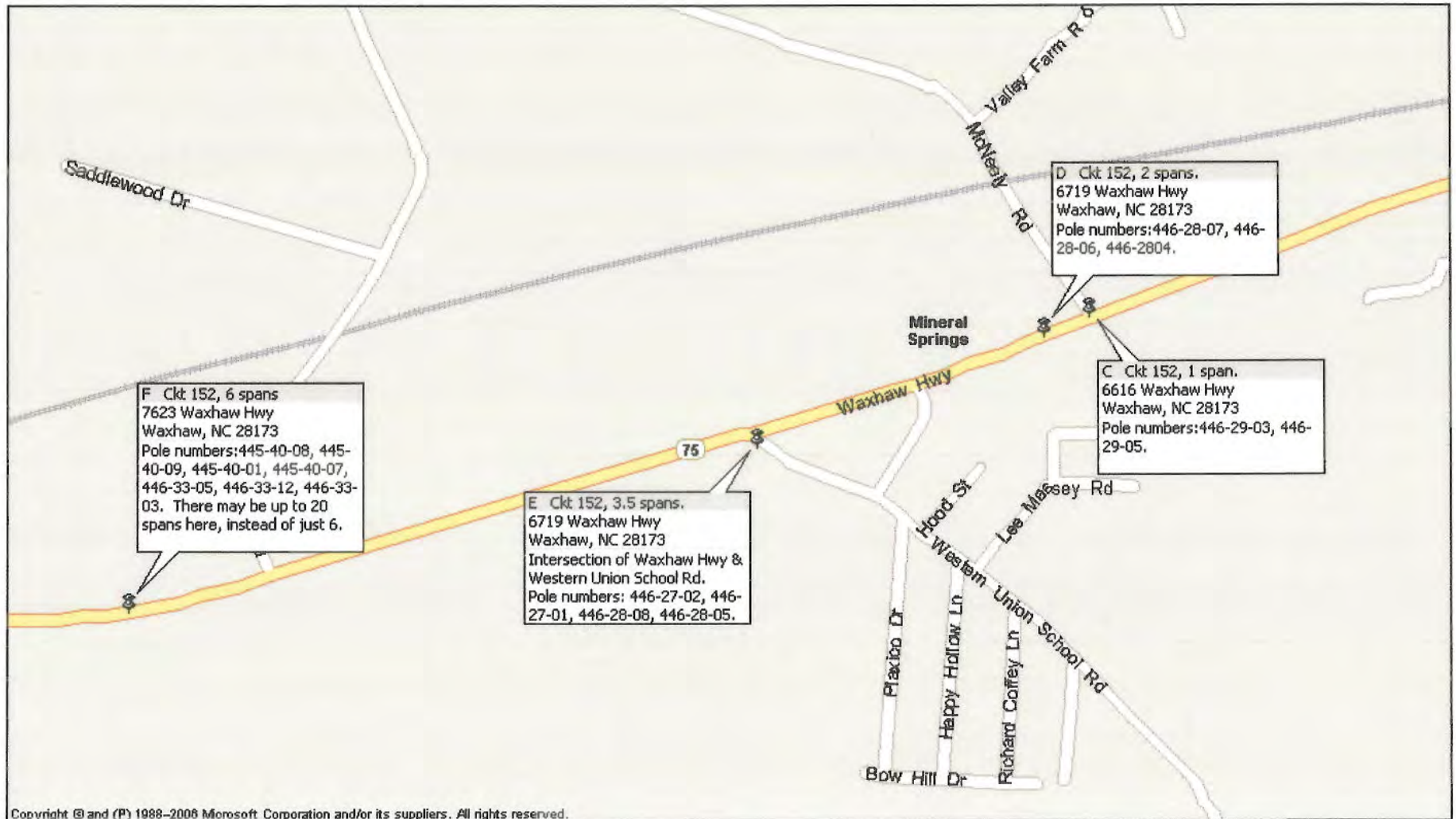
Schweinitz Sunflower Site A



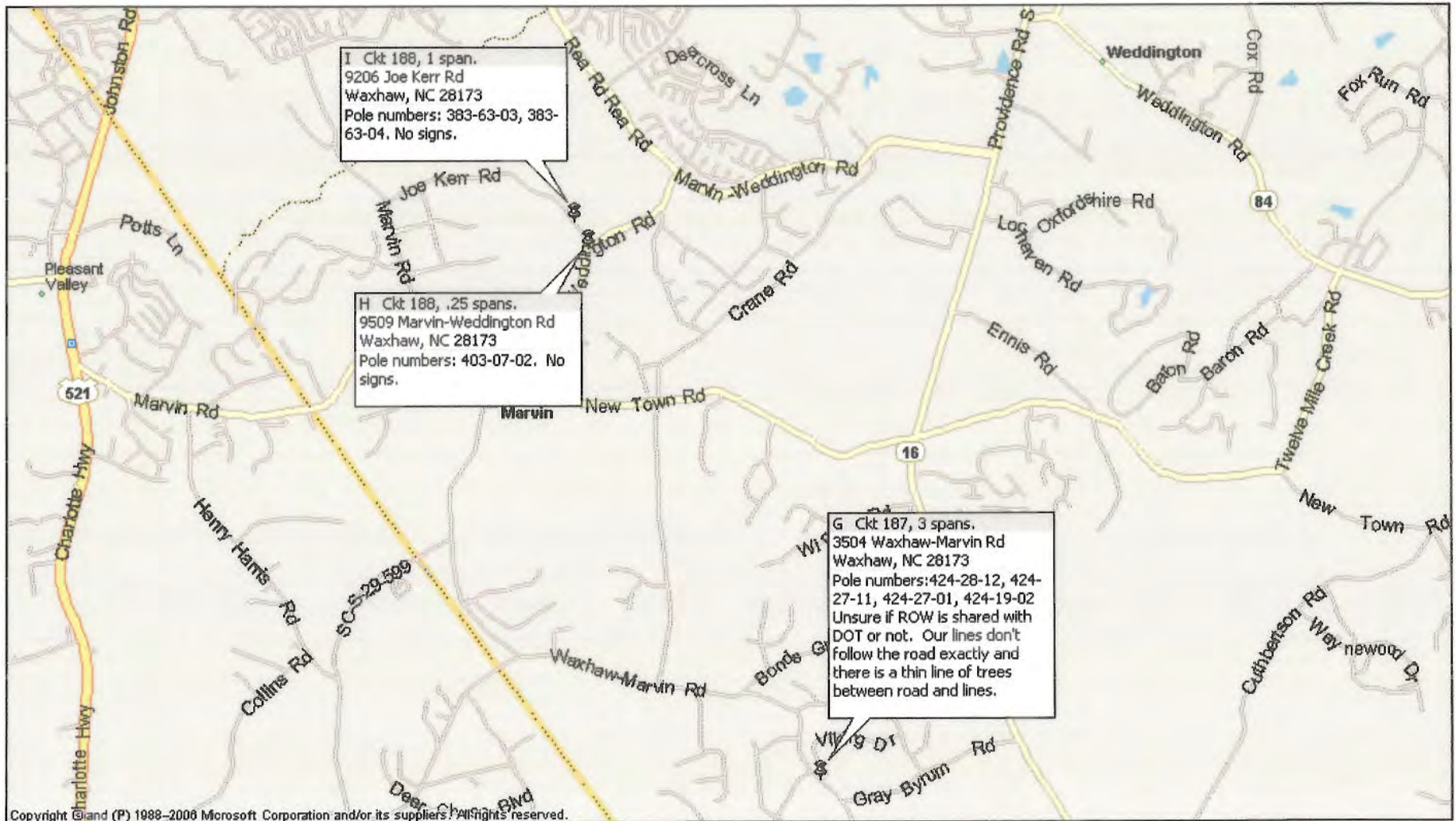
Schweinitz Sunflower Site B



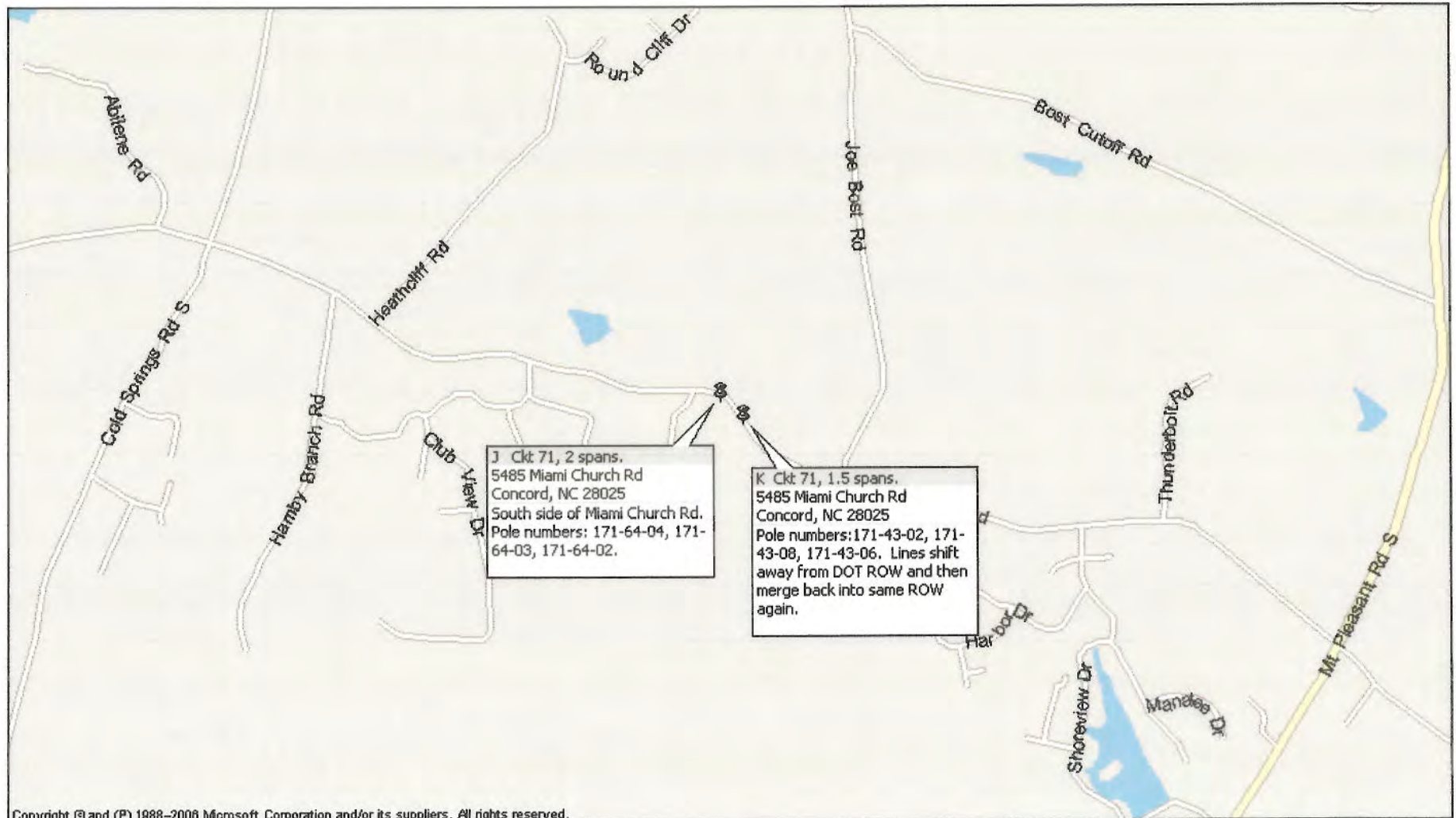
Schweinitz Sunflower Site C-F



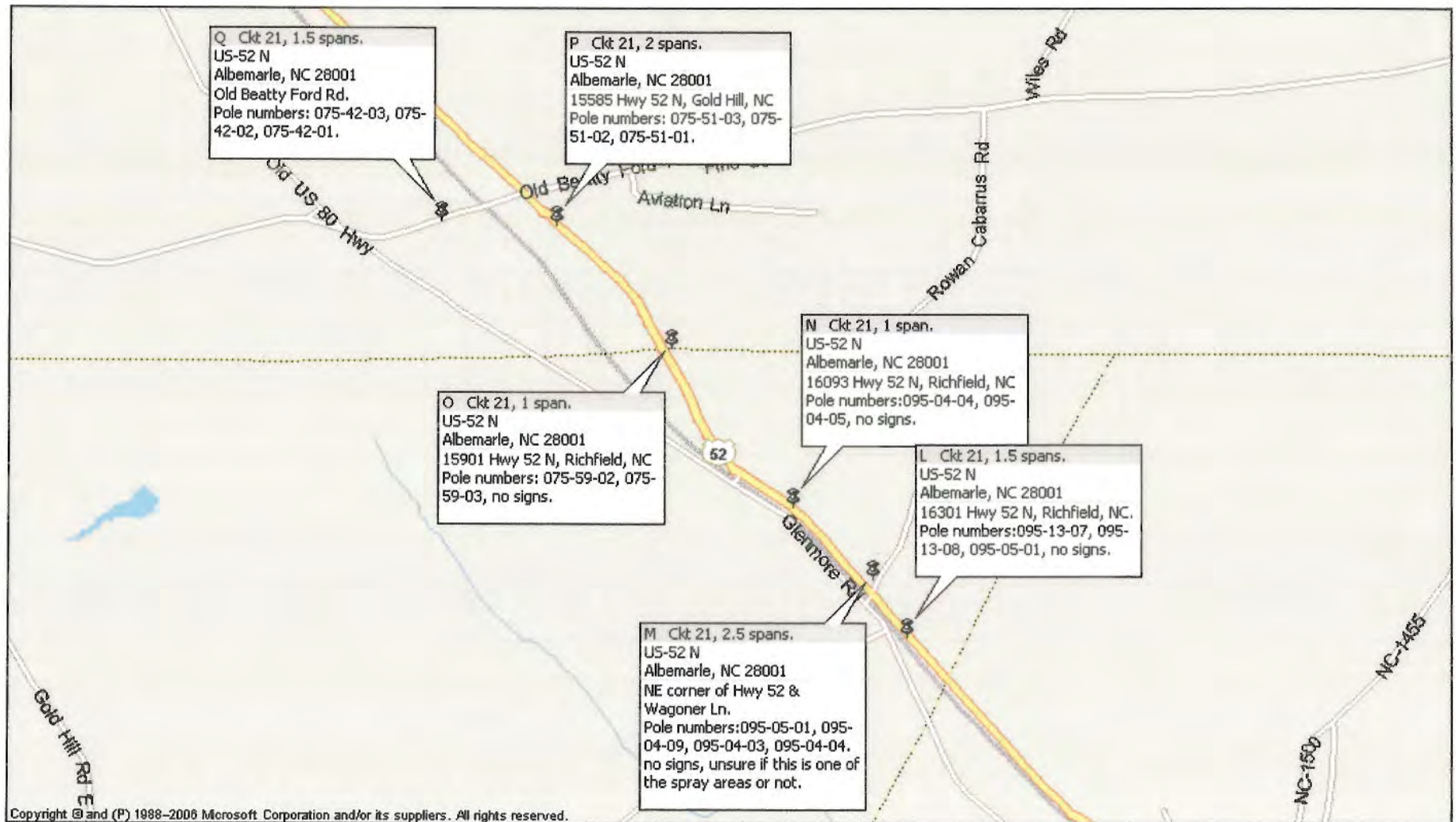
Schweinitz Sunflower Site G-I



Schweinitz Sunflower Site J & K



Schweinitz Sunflower Site L-Q



APPENDIX E

**NCDOT Roadside Vegetation
Management Guidelines in Marked Areas**



Chapter 11
Appendix

11.33. NCDOT Roadside Vegetation Management Guidelines in Marked Areas

Example 35 : NCDOT Roadside Vegetation Management Guidelines in Marked Areas

- No mowing April 1-November 15.
- No herbicides, no fertilizers. (Exceptions can be made for herbicides under special circumstances, discussed below.)
- Mowing from November 16-March 31 is allowed and, in most cases (*see exception below) , should be done at least *every other year*. Winter mowing every year is acceptable. If regular contract mowers are unable to mow the sites under this time frame, NCDOT mowers may be used during the winter.
- Mowing should not be conducted when the soil is wet, as compaction and rutting will occur.
- In some instances, rare plants may be growing right along the edge of the road. Ideally, the plants should be protected if at all possible in this situation, but if NCDOT division staff determine that the road shoulder should be mowed during the growing season for safety or visibility, then the shoulder may be mowed accordingly. If possible, an NCDOT biologist can visit the site and mark where individual plants are, so they can be avoided.
- NCDOT mowing contracts are under modification to ensure that contractors are responsible for finding out if any endangered plants are within the areas they will be working, and for avoiding injury to the plants. The County Mowing Inspector or the Division Roadside Environmental Engineer should review the No Mow policy with each county maintenance office and mowing contractor prior to any mowing activities on roads with rare plant populations.
- The standard mowing height is usually four inches; ideally, the mower should be set at a level to avoid scalping the ground and damaging rare plants.
- Clippings from winter mowing should be left on site so any rare plant seeds produced will have the opportunity to germinate within the population. An exception can be made if only weeds are reproducing.
- Prior to entering the site, mowers and equipment should be cleaned off, removing any accumulated vegetative debris that contains weed seeds.
- Rare plants along roadsides often extend into utility line ROWs. Utilities managing plant growth in DOT ROWs must be told that herbicide use on DOT ROW is unlawful without a permit. Utilities conducting plant management *adjacent* to DOT ROWs should be notified when rare plants are present.

* Mowing Exception

There is an exception to winter mowing for Virginia spiraea. This shrub is found along streams, rivers and roadsides in the mountains. Because it is a woody shrub it should **never** be mowed, regardless of the time of year. Trimming or selective thinning of other woody vegetation that compete with this species may be recommended for management.

Signs/Stakes

When rare plants are discovered on NCDOT's ROW, the population should be marked with 'Do Not Mow' signs. These signs should be large enough to be easily noticed by roadside mowers. A variety of signs have already been placed along roadside populations; most simply state, 'Do Not Mow' while others include dates for the no mow period (April 1 - November 15), or add 'Do Not Spray.' To ensure that signs are readily understood by a variety of workers, signs with universal symbols for 'Do Not Mow' and 'Do Not Spray' are under review for future use.

Do Not Mow signs should be positioned at both ends of a population, facing so mowers will see the signs as they approach the No Mow area. Where rare plants occur along a significant stretch of roadway it is suggested that double sided Do Not Mow signs be placed periodically along the population - two Do Not Mow signs placed back to back on a single post. The reasoning for this is that if a sign at one end of the population disappears, the mower will encounter another Do Not Mow sign before the entire population is mowed. Maintaining the signs and seeing that they are visible and in good condition is critical in order to protect these populations. Damaged or missing signs should be replaced as soon as possible, especially during the growing season. If possible, signs should be placed at a low enough level for the mower operator to see.

White-topped wooden stakes can also be useful in alerting mower operators that the site is designated as a No Mow area. These should be used in addition to (not instead of) Do Not Mow signs. The wooden stakes are approximately 40 inches long with the top six inches painted white, the same stakes used to delineate mowing patterns and areas that are off limits to mowers. Stakes should be placed at regular intervals along the entire edge of the roadway side of the population.

Encroachments/Maintenance

Division environmental officers, district offices and maintenance units should make sure rare plant sites are taken into consideration for proposed ROW encroachments and maintenance work. ROW encroachments such as driveways, utility work, minor widenings, installation of utility lines and pipes for driveways have the potential to damage rare plant populations. All ROW access requests and driveway access applications in areas where rare species are known to occur should be reviewed to ensure there will be no impacts. If impacts to rare plants are likely to occur, efforts should be made to avoid or minimize damage. District offices should maintain secondary road files with a notation to remind them that the road has a protected species.

Roadside maintenance activities, such as grading and ditch maintenance can also harm rare plants. As above, if impacts to rare plants are likely to occur, efforts should be made to avoid or minimize damage. Heavy equipment should be kept out of rare plant areas during the No Mow period. Employees working in the area should be shown the rare plant so they can avoid damaging them.

Herbicide Use

To reduce competition from invasive weeds, herbicides should only be used when mechanical removal is not an option. Herbicides can be used near rare plant populations when specifically prescribed by someone familiar with the biology of the rare plant. Two main herbicides have been recommended for use on roadside rare plant populations. These herbicides have been tried in a variety of situations by NCDOT and are believed to be most suitable for managing these sites, glyphosate and triclopyr for woody vegetation. All herbicide applications for roadside rare plant sites should be conducted by a Licensed Pesticide Applicator.

[< back to top >](#)

[Return to Section 1.1 »](#)

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APPENDIX F

NCTA Schweinitz's Sunflower Preservation Request Letters

**NCDOT Division 10
Union Power**



STATE OF NORTH CAROLINA
TURNPIKE AUTHORITY

BEVERLY E. PERDUE
GOVERNOR

1578 MAIL SERVICE CENTER, RALEIGH, N.C. 27699-1578

DAVID W. JOYNER
EXECUTIVE DIRECTOR

March 23, 2010

Mr. Larry Thompson, Division Environmental Officer
North Carolina Department of Transportation
Division 10
716 West Main Street
Albemarle, NC 28001

**RE: STIP R-3329/R-2559 (Monroe Connector/Bypass)
Preservation-in-Place of federally endangered Schweinitz's sunflower
populations within NCDOT and Union Power rights of way on Secrest
Shortcut Road**

Dear Mr. Thompson:

The North Carolina Turnpike Authority (NCTA) has conducted threatened and endangered species surveys for the proposed Monroe Connector/Bypass (STIP R-3329/R-2559) in Union County and Mecklenburg counties. During these surveys, two populations of the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*) were identified within NCDOT right of way and Union Power right of way. These populations have the potential to be indirectly affected by the proposed project. The populations are described below and shown in the enclosed figure.

Population #1

This population is located on Secrest Shortcut Road (SR 1501), approximately 600 feet west of the intersection with Unionville-Indian Trail Road along the southern side of the road near GPS location 35.0759° N, -80.6136° W. It is a very small population (12 stems) that occurs primarily between the roadside swale and the power line adjacent to Secrest Shortcut Road.

Population #2

This population is located on Secrest Shortcut Road (SR 1501) between Unionville-Indian Trail Road (SR 1367) and the crossing of the South Fork Crooked Creek near GPS location 35.0721°N, -80.6097°W. It includes 103 stems on the northern side and 31 stems on the southwestern side of Secrest Shortcut Road. This population is currently mapped by the NC Natural Heritage Program (NHP) as element occurrence (EO) # 77.

NCTA is proposing specific management actions to preserve these two populations in place as a conservation measure to offset potential indirect effects of the proposed Monroe Connector/Bypass. We are requesting that the Division install "Do Not Mow" signs at these locations by June 1, 2010. We also request that the Division manage these populations per the "NCDOT Roadside Vegetation Management Guidelines in Marked Areas" guidance.

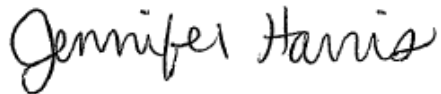
We have notified Union Power of the presence of these populations and have requested they add these two populations to their vegetation management plan. A copy of this letter is attached.

Additionally, it is our understanding that the Schweinitz's sunflower population on Goldmine Road (EO# 78) may not be marked with "Do Not Mow" signs. Please ensure that signs are installed at this location.

Please consider our request to preserve these two populations in place and verify in writing to the address above your commitment to manage the aforementioned sites in accordance with your vegetation management guidelines. We would appreciate your response by May 7, 2010.

If you have any questions or concerns regarding our request, please feel free to contact me or Christy Shumate at (919) 571-3000.

Sincerely,

A handwritten signature in cursive script that reads "Jennifer Harris".

Jennifer Harris, P.E.
Director of Planning and Environmental Studies

Enclosures:

Figure 1 – Schweinitz's Sunflower Populations: Preservation Sites
Copy of letter to Mr. Wil Ortiz, Union Power

cc: George Hoops, FHWA
Bruce Ellis, NCDOT
Barry Moose, NCDOT Division 10
Jennifer Callahan, The Catena Group



The Catena Group

Date: February 2010

Scale: 0 190 380 Feet

Job No.: 1125

Title: Monroe Connector/Bypass (R-3329/R-2559)

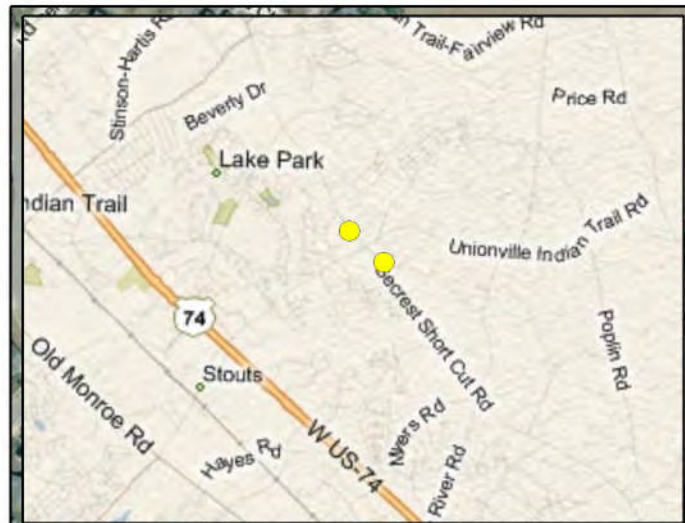
Schweinitz's Sunflower Populations: Preservation Sites

Union County, North Carolina

Aerial Photography: www.birgmaps.com

Client: North Carolina Turnpike Authority

Figure 1



Schweinitz's Sunflower Population



STATE OF NORTH CAROLINA
TURNPIKE AUTHORITY

BEVERLY E. PERDUE
GOVERNOR

1578 MAIL SERVICE CENTER, RALEIGH, N.C. 27699-1578

DAVID W. JOYNER
EXECUTIVE DIRECTOR

March 23, 2010

Mr. Wil Ortiz
Regional Managing Arborist
Union Power Cooperative
Union Services Building
1543 Rocky River Road
Monroe, NC 28110

**RE: STIP R-3329/R-2559 (Monroe Connector/Bypass)
Request for Preservation of federally endangered Schweinitz's sunflower
populations within NCDOT and Union Power rights of way**

Dear Mr. Ortiz:

The North Carolina Turnpike Authority (NCTA) has conducted threatened and endangered species surveys for the proposed Monroe Connector/Bypass (STIP R-3329/R-2559) in Mecklenburg and Union counties, NC. During these surveys, two previously unidentified populations of the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*) were identified within Union Power right of way and NCDOT right of way. The populations are described below and shown in the enclosed figure.

Population #1

This population is located on Secrest Shortcut Road (SR 1501), approximately 600 feet west of the intersection with Unionville-Indian Trail Road along the southern side of the road near GPS location 35.0759° N, -80.6136° W. It is a very small population (12 stems) that occurs primarily between the roadside swale and the power line adjacent to Secrest Shortcut Road.

Population #2

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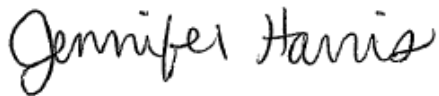
NCTA is proposing specific management actions to preserve these two populations in place as a conservation measure to offset potential indirect effects of the proposed Monroe Connector/Bypass. "Do Not Mow" signs will be installed at these locations by June 1, 2010. We are requesting that Union Power add these two populations to the "Understanding Reached with US Fish and Wildlife Service Regarding Access Into Schweinitz's Sunflower Restricted Sites Because of Union Power Cooperative Operations" vegetation management plan.

Additionally, it is our understanding that population B (on Goldmine Road) in your vegetation management plan is shown as lacking "Do Not Mow" signs. We have contacted NCDOT Division 10 to install signs at this location.

Please consider our request to preserve these two populations and verify in writing to the address above your commitment to include the aforementioned sites in your vegetation management plan. We appreciate your response by May 7, 2010. We look forward to continuing to manage protected species sites within our shared rights of way with Union Power.

If you have any questions or concerns regarding our request, please feel free to contact me or Christy Shumate at (919) 571-3000.

Sincerely,

A handwritten signature in cursive script that reads "Jennifer Harris".

Jennifer Harris, P.E.
Director of Planning and Environmental Studies

Enclosures:

Figure 1 – Schweinitz's Sunflower Populations: Preservation Sites

cc: George Hoops, FHWA
Bruce Ellis, NCDOT
Barry Moose, NCDOT Division 10
Larry Thompson, NCDOT Division 10
Jennifer Callahan, The Catena Group



The Catena Group

Date: February 2010

Scale: 0 190 380 Feet

Job No.: 1125

Title: Monroe Connector/Bypass (R-3329/R-2559)

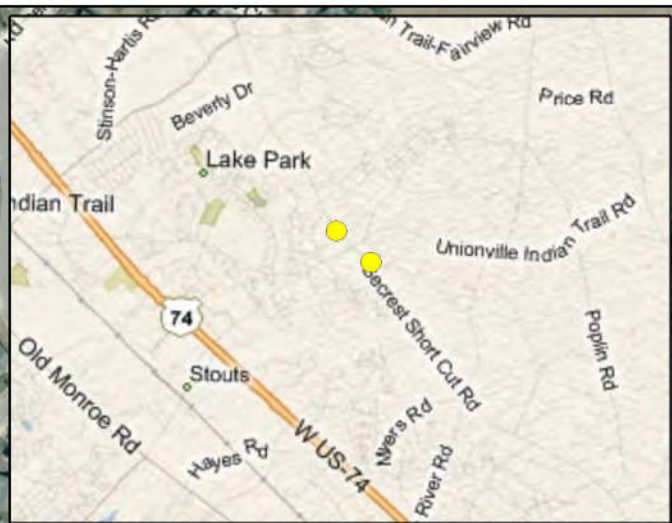
Schweinitz's Sunflower Populations: Preservation Sites

Union County, North Carolina

Aerial Photography: www.birgmaps.com

Client: North Carolina Turnpike Authority

Figure 1



Schweinitz's Sunflower Population #1

Schweinitz's Sunflower Population #2

Schweinitz's Sunflower Population