

## APPENDIX H. RARE AND PROTECTED SPECIES SUPPLEMENTAL EXISTING ENVIRONMENT INFORMATION

### Appendix H. Rare and Protected Species Supplemental Existing Environment Information

Correlates with the following Sections:

#### *Section 5.8 – Rare and Protected Species and Habitats*

##### *5.8.1 – Federally Protected Species*

###### *Carolina Heelsplitter (Lasmigona decorata)*

The Carolina heelsplitter is a freshwater mussel species that was listed as federally endangered in 1993. The shell shape is ovate trapezoid with a straight dorsal margin that sometimes ends with a slight wing. The shell color is green or brown and may have green or black rays. The inner shell is white to mottled pale orange. Average shell length is around 78 mm.

Historically, Carolina heelsplitters were found in the Catawba River drainage around Mecklenburg County, in the Pee Dee River drainage in Union and Cabarrus Counties, and in the Saluda and Savannah River systems of South Carolina. According to the USFWS, there are currently only three extant populations known to exist in North Carolina. One population on Goose Creek in the Pee Dee River drainage, a population in Waxhaw Creek and Six Mile Creek in the Catawba River drainage, all in Union County. There are four extant populations known to exist in South Carolina. According to the NHIP, Carolina heelsplitter is thought to be extirpated from Gaston and Mecklenburg Counties.

The Carolina heelsplitter could historically be found in small to large streams and in small mill ponds. They are typically found in mud, muddy sand, or muddy gravel in well shaded streams. It is thought however that degradation of preferred more stable gravel habitats has restricted the species to these less desirable habitats. The decline of the species has been attributed to stream bank destabilization due to agriculture and development practices, impoundments, channelization, dredging and declining water quality. The presence of the Carolina heelsplitter (*Lasmigona decorata*) mussel in the project area is based on “historic occurrence”, but the species is believed to be extirpated from the area. There has been no recent verification of its continued existence within the service area. Mussel surveys conducted in early 2008 throughout the service area found no evidence of the Carolina heelsplitter.

Of the two general aquatic habitat types present within the alternate project areas, the open lake and shoreline habitat of the reservoir and the urbanized and sediment-impacted areas of Long Creek and Fites Creek, both have extremely limited potential to support Carolina heelsplitter.

###### *Schweinitz’s Sunflower (Helianthus schweinitzii)*

The Schweinitz’s sunflower was listed as a federally endangered species in 1991. Schweinitz’s sunflower is a rhizomatous perennial herb in the aster family that grows from 3 to 6 ft (1 to 2 m) tall from a cluster of carrot-like tuberous roots. Stems are usually solitary, branching only at or above mid-stem. The stem is usually pubescent but can be nearly glabrous; it is often purple. The lanceolate leaves are opposite on the lower stem, changing to alternate above. They are variable in size, being generally larger on the lower stem and gradually reduced upwards. The pubescence of the underside of the leaves is distinctive and is one of the best characters to

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distinguish Schweinitz's sunflower from its relatives. The upper surface of the leaves is rough, with the broad-based spinose hairs directed toward the tip of the leaf. From September to frost, Schweinitz's sunflower blooms with comparatively small heads of yellow flowers.

The species occurs in clearings and edges of upland woods on moist to dryish clays, clay-loams, or sandy clay-loams that often have high gravel content and are moderately podzolized. Schweinitz's sunflower usually grows in open habitats not typical of the current general landscape in the piedmont of the Carolinas. Some of the associated species, many of which are also rare, have affinities to glade and prairie habitats of the Midwest. Other species are associated with fire-maintained sandhills and savannas of the Atlantic Coastal Plain and piedmont. The habitat of this sunflower tends to be dominated by members of the aster, pea, and grass families, an association emphasizing affinities of the habitat to both longleaf pine-dominated sandhills and savannas of the southeastern coastal plain and to glades, barrens, and prairies of the Midwest and Plains (USFWS 2005).

Suitable habitat for Schweinitz's sunflower exists within the proposed alternative sites in the form of disturbed-maintained areas. Surveys for this species are normally conducted during the appropriate flowering time (mid-August through the first frost). During a site visit on October 15, 2007, four (4) stems of Schweinitz's sunflower were located. These plants were confirmed by Misty Buchanan (North Carolina Natural Heritage Program) and Dale Suiter (USFWS). Several extant populations of Schweinitz's sunflower exist throughout the proposed service area (Figure 5.8a).

### Michaux's Sumac (*Rhus michauxii*)

The Michaux's sumac was listed as a federally endangered species in 1989. Michaux's sumac is a rhizomatous shrub in the cashew family (*Anacardiaceae*), with erect stems that grow 1 to 3 feet high. This sumac can be distinguished by compound leaves with evenly serrated, oblong to lanceolate acuminate leaflets. Typically, most plants are unisexual but some have been found with both male and female flowers. Flowers are in terminal clusters, small, and colored greenish yellow to white. Flowering occurs from June to July. A red drupe fruit is produced in August through October.

The sumac is thought to be endemic to the coastal plain and piedmont of North and South Carolina, Georgia, and Florida. According to USFWS, thirty one extant populations are known to occur in North Carolina. According to the NHID, three counties in North Carolina are known to have extant population while three other counties have historically had population that may now be extirpated. This species grows in sandy or rocky open woods with basic soils. It survives best in disturbed areas such as highway right of ways, roadsides, or maintained areas.

Surveys were conducted in August of 2007, and Michaux's sumac populations were not found within the proposed alternative sites. Two extant populations exist within the proposed service area. One population exists in the Shuffletown Prairie Nature Preserve and one within the Latta Plantation Nature Preserve (Figure 5.8a).

### Smooth Coneflower (*Echinacea laevigata*)

The smooth coneflower was listed as a federally endangered species in 1992. Smooth coneflower is an herbaceous perennial species in the aster family (*Asteraceae*) that typically grows to a height of 1.5 meters. Flower heads are large, solitary and distinguished by long lanceolate basal leaves that can reach 20 cm in length. Rays are typically

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light pink to purple and 5 to 8 cm long. Flowering occurs in late May through mid July. Fruiting occurs in June through September and fruits usually persist throughout the fall.

Smooth coneflower is usually found in habitats that have a high level of disturbance and abundant sunlight. Historically, this species depended on fire and large herbivores for necessary habitat maintenance that reduced competition and shading. Populations of smooth coneflower can be found in open woods, cedar barrens, dry limestone bluffs, and power line right of ways in magnesium and calcium rich soils.

Surveys were conducted in August of 2007 during flowering season, and no smooth coneflower populations were found within the proposed alternative sites. An extant population of the smooth coneflower does exist within the proposed service area in the Shuffletown powerline rare plant site (Figure 5.8a).

### Georgia Aster (*Symphotrichum georgianum*)

The Georgia aster was listed as a candidate for federal protection in 2002 and is currently listed as threatened by the State of North Carolina. Georgia aster is a perennial in the aster family that appears typically with 1 to 2 stems 1.4 to 8 dm tall, arising from an underground rhizome. Leaves on this aster are thick, lanceolate to oblanceolate. Flower heads are produced from October to mid-November and are distinguished by a white disk of flowers with purplish tips on the corollas, purple anthers, and white pollen. Flower heads are 5 cm across with purple rays 2 cm in length. Fruiting occurs in November through December and consists of a ribbed achene up to 4 mm in length with spreading trichomes.

Georgia aster existed widely in the southeast before wildfire suppression and the removal of large native herbivores. This species prefers habitats with a high frequency of disturbance and can be found near roads, along woodland edges, and utility right of ways where the vegetation is maintained. The main mode of reproduction in this species is vegetative and therefore most populations are small and isolated.

According to the NHIP, extant Georgia aster populations are documented in eight counties in North Carolina including Mecklenburg County. Surveys were conducted in August of 2007 during flowering season, and Georgia aster populations were not found within the proposed alternative sites. Georgia aster populations can be found throughout maintained areas within the proposed service area (Figure 5.8a).

### Carolina Birdfoot-trefoil (*Lotus unifoliatu*s var. *helleri*)

The Carolina birdfoot-trefoil is a federal species of concern and listed as significantly rare in North Carolina. The birdfoot-trefoil is an annual that first appears in early April. In a study population in Wake County, growth was observed throughout the summer into early fall to an average stem height of approximately 48.7 +/- 12.11 cm (Masson and Stucky 2007 unpublished draft). Flowering and fruiting in the study population both took place in August through September. Lateral branches are produced in the upper half of the mainstem and are two ranked. Stems are characteristically red with flowers, leaves, and fruit growing on the lateral branches. Individual seed pods are produced, each containing 3 to 5 seeds.

Carolina birdfoot-trefoil typically inhabits open woods and early successional areas such as road sides and utility right of ways. In North Carolina, populations are known for 11 Piedmont counties including Mecklenburg. Surveys were conducted in August of 2007 and trefoil populations were not found within the proposed alternative

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sites. There are two populations within the service area along Thomas Pond Creek, a tributary to Long Creek (Figure 5.8a).

### 5.8.3 - Other Significant Species

#### Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle has recently been removed from the federal endangered species list due to recovery of significant populations throughout the United States. The bald eagle is still protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act. This is a large raptor primarily associated with coasts, large rivers, and lakes. Nests are usually constructed in large trees or snags as well as artificial nesting habitats placed near large water bodies. They typically will nest in the largest trees in the vicinity where open views of the surrounding area are ample. Nests can be six feet wide and weigh hundreds of pounds.

Significant habitat opportunities do exist for the bald eagle in and around the WWTP project alternative areas as well as throughout the proposed service area. Surveys were conducted in August 2007 and no bald eagle nests were found at the WWTP alternative project areas. There are no documented roosting or nest areas for bald eagle near the WWTP alternative sites.

#### Carolina Elktoe (*Alasmidonta robusta*)

Very little is known about the life history of the Carolina elktoe. The last type specimen to be collected was from Long Creek prior to 1979. There are reports of a specimen found in Poison Fork, in Montgomery County in 2002. Aside from these reports, according to the NC NHP, this species is assumed to be extirpated from the State of North Carolina. Due to the scarcity of data, no federal or state protection has been given to this species.

#### Southern Bog Turtle (*Clemmys muhlenbergii*)

Due to the decline of northern populations of bog turtle, this species was listed as federally threatened due to similarity of appearance with the northern bog turtle under the Endangered Species Act in 1997. An adult bog turtle shell averages about 3 to 4.5 inches in length. They are distinguished by a large bright orange, yellow, or red blotch on each side of the head. The upper shell is dark brown with yellow and orange markings. The rigid plates of the upper shell are eventually worn smooth with age. The lower shell is typically dark brown or black.

Bog turtles are most active during the fall and spring but hibernate in the winter and are likely inactive during the hotter part of the year. Their preferred habitats are open canopy wetland areas with many micro habitats that include dry, saturated, and periodically flooded areas. They typically use dryer shallow areas during the spring and hibernate in muddy bottoms during the winter. Wooded swamps are typically unsuitable as bog turtle habitat. Bog turtle habitat was not found during a wetland survey of the WWTP alternative locations conducted in August 2007. None of the wetlands described during the survey are ideal habitats for the bog turtle and impacts are not expected.

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# APPENDIX I. SOILS WITH FARMLAND DESIGNATION SUPPLEMENTAL EXISTING ENVIRONMENT INFORMATION

## Appendix I. Soils with Farmland Designation Supplemental Existing Environment Information

Correlates with the following Sections:

### *Section 5.11 Prime Agricultural Lands*

Table 5.11a: Service Area Soils with Farmland Designation

Map Key	Description
<b>Prime Farmland</b>	
ApB	Appling sandy loam, 2 to 8% slopes
CeB2	Cecil sandy clay loam, 2 to 8% slopes, eroded
Co	Congaree loam, frequently flooded
DaB	Davidson sandy clay loam, 2 to 8% slopes
EnB	Enon sandy loam, 2 to 8% slopes
GaB2	Gaston sandy clay loam, 2 to 8% slopes, eroded
HeB	Helena sandy loam, 2 to 8% slopes
MaB2	Madison sandy clay loam, 2 to 8% slopes, eroded
MeB	Mecklenburg fine sandy loam, 2 to 8% slopes
VaB	Vance sandy loam, 2 to 8% slopes
WnB	Winnsboro loam, 2 to 8% slopes
<b>Farmland of Statewide Importance</b>	
ApD	Appling sandy loam, 8 to 15% slopes
CeD2	Cecil sandy clay loam, 8 to 15% slopes, eroded
DaD	Davidson sandy clay loam, 8 to 15% slopes
EnD	Enon sandy loam, 8 to 15% slopes
GaD2	Gaston sandy clay loam, 8 to 15% slopes, eroded
IrA	Iredell fine sandy loam, 0 to 1% slopes
IrB	Iredell fine sandy loam, 1 to 8% slopes
MaD2	Madison sandy clay loam, 8 to 15% slopes, eroded
PaD2	Pacolet sandy clay loam, 8 to 15% slopes, eroded
VaD	Vance sandy loam, 8 to 15% slopes
WeD	Wedowee sandy loam, 8 to 15% slopes
WnD	Winnsboro loam, 8 to 15% slopes
<b>Prime Farmland if drained and either protected from flooding or not frequently flooded during the growing season</b>	
CH	Chewalca loam, frequently flooded
MO	Monacan loam

## **Appendix J Local Regulations, Policies, and Ordinances**

Corresponds with Section 7 – Impact Minimization and Mitigation

### **Town of Stanley**

- **Stormwater Ordinance:** Interlocal Agreement for enforcement services for Gaston County Stormwater Ordinance 20 August 2007. Resolution to adopt Gaston County Stormwater Ordinance and Approve Interlocal Agreement with Gaston County to Enforce the Ordinance in Municipal Boundaries 7 May 2007.
- **Soil Erosion and Sediment Control:** Gaston County enforces the County’s Soil Erosion and Sedimentation Control Ordinance within Stanley.

### **Town of Mount Holly**

- **Water Supply Watershed Protection Rules**
- **Zoning Ordinance.** Chapter 20, Mount Holly Code of Ordinances. Includes floodplain regulations: Article XVI Flood Plain Management and Article V Section 5.13: Watershed Overlay District.
- **Soil Erosion and Sediment Control.** Gaston County enforces the County’s Soil Erosion and Sedimentation Control Ordinance within Mount Holly.

### **Town of Huntersville**

- **Post-Construction Storm Water Ordinance.** 30 June 2007, revised 10 January 2008. See Mecklenburg County.
- **Floodplain Regulations.** Mecklenburg County is designated as Floodplain Administrator. Ordinance available online:  
<ftp://ftp1.co.mecklenburg.nc.us/luesa/stormwater/Floodplain%20Regulations/Meck%20Flood%20Regs%20Adopted%20121900.pdf> (accessed 02/28/08)

- **Zoning Ordinance.** Amended 18 July 2007. Includes Watershed Overlay District regulations in Article 3. Available online:  
[http://www.huntersville.org/interactive%20ordinance/ZONING\\_TOCA3.htm](http://www.huntersville.org/interactive%20ordinance/ZONING_TOCA3.htm)  
(accessed 02/28/08)
- **Soil Erosion and Sedimentation Control.** Adopted Mecklenburg County Ordinance.
- **Surface Water Improvement and Management Ordinance.** Available online:  
<http://www.charmeck.org/NR/rdonlyres/e654rznq4y7buw24flxf4hqwmva5ibsvd22y uogi3jx4h4vht45xwuhk5qvm22qizzazmlpaxlwiphjofckodeie7f/huntersville.pdf>  
(accessed 02/28/08)

### **City of Charlotte**

- **Soil Erosion and Sedimentation Control Ordinance.** 28 May 2002. Available online:  
[http://www.charmeck.org/NR/rdonlyres/eh6dbi4c5ktggb6gecdfxrek33e4currupomb gt5uxbpmzk3qcjacaclcl5bg5iuh3acqdtuw34aicck6skfhfpm/Erosion+Control+Ord+as+adopted+5\\_28\\_2002.pdf](http://www.charmeck.org/NR/rdonlyres/eh6dbi4c5ktggb6gecdfxrek33e4currupomb gt5uxbpmzk3qcjacaclcl5bg5iuh3acqdtuw34aicck6skfhfpm/Erosion+Control+Ord+as+adopted+5_28_2002.pdf) (accessed 02/28/08)
- **Post Construction Controls Ordinance.** Effective 1 July 2008. Applies to City limits and ETJ. Available online:  
<http://www.charmeck.org/NR/rdonlyres/emwzm64sk3w5enos7xsxbxvyuxhcqkfu7xntybva6vul4euolm474ahngjxmwmnu2zd4kuhx4mtuy7fhxwcqljx6xxg/CharlottePostConstructionControlsOrdinance.pdf> (accessed 02/28/08)
- **Water Supply Watershed Protection.** Available online:  
<http://www.municode.com/Resources/gateway.asp?pid=19970&sid=33> (Accessed 02/28/08)
- **Charlotte Mecklenburg Stormwater Design Manual (2008/2008).** Available online:



<http://www.charmeck.org/Departments/StormWater/Contractors/Storm+Water+Design+Manual.htm#> (accessed 02/28/08)

- **Floodplain Regulations.** Chapter 6, City of Charlotte Code of Ordinances. 1 July 2007. Available online:  
<http://www.charmeck.org/NR/rdonlyres/ebcpygbrq45aby7urtudok7zp77szomviuqjfyqifuaaqhsgkjhpysciutjzwerbovpqozigxe2wjmjglvjq2g4blha/ALLFinalFloodOrdinanceCharlotte.pdf> (accessed 02/28/08)
- **Zoning Ordinance.** Available online:  
<http://www.municode.com/Resources/gateway.asp?pid=19970&sid=33> (accessed 02/28/08)
- **Surface Water Improvement and Management Ordinance.** Available online:  
<http://www.charmeck.org/NR/rdonlyres/e5uldirms3xp4bp2n43a7nmhughfxuxmteczn6y6qum2hzptzd7gihkg4ynu5hichoqmoba346sq6arfhejho7uqmig/Charlotte.pdf> (accessed 02/28/08)

## **Gaston County**

- **Gaston County Unified Development Ordinance:** Adopted January 22, 2009. Available online:  
<http://library.municode.com/index.aspx?clientID=14664&stateID=33&statename=North%20Carolina>
- **Soil Erosion and Sediment Control Ordinance.** 28 June 2007 (note that says effective July 1.) Applies to unincorporated areas of the County with exemptions for agriculture and forestry. Available online:  
<http://www.co.gaston.nc.us/NaturalResources/PDF/ESControlOrdinance.pdf> (accessed 02/28/08)

- **Flood Damage Prevention Ordinance.** 28 September 2007. Available online: <http://www.co.gaston.nc.us/ordinances/2007FloodDamagePreventionOrd.pdf> (accessed 02/28/08)
- **Watershed Protection Ordinance.** 25 September 1997. Available online: <http://www.co.gaston.nc.us/ordinances/watershedord10197.pdf> (accessed 02/28/08)
- **Stormwater Ordinance.** 26 July 2007. Applies to all of County except areas within water supply watersheds or city limits of municipalities. Available online: <http://www.co.gaston.nc.us/ordinances/StormwaterOrdinance.pdf> (accessed 02/28/08)
- **Zoning Ordinance.** 9 January 1992. Amended through 26 October 2006. Available online: <http://www.co.gaston.nc.us/ordinances/ordinances.HTM> (accessed 02/28/08)

### **Mecklenburg County**

- **Post-Construction Stormwater Ordinance.** 30 June 2007, revised 10 January 2008. Applies to all unincorporated areas. Adopted together with Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville. Available online: <http://www.charmeck.org/NR/rdonlyres/emwzm64sk3w5enos7xsxbxvyuxhcqkfu7xntybva6vul4euolm474ahngjxmwmnu2zd4kuhx4mtuy7fhxwcqljx6xxg/CharlottePostConstructionControlsOrdinance.pdf> (accessed 02/28/08)
- **Floodplain Regulations.** 19 December 2000. Available online: <ftp://ftp1.co.mecklenburg.nc.us/luesa/stormwater/Floodplain%20Regulations/Meck%20Flood%20Regs%20Adopted%20121900.pdf> (accessed 02/28/08)
- **Soil Erosion and Sedimentation Control Ordinance.** Applies to unincorporated areas of County with exemptions for agriculture and forestry. Available online: <http://www.charmeck.org/NR/rdonlyres/exwnbflszjvumu2ae4zzexhfdhrzc2adorqwpj>

- [wifp6drz4cmj3yixmylgwkwqhti2o4v4d4ptqzhqq7r2vcihwztgg/ErosOrd.pdf](#) (accessed 02/28/08)
- **Charlotte Mecklenburg Stormwater Design Manual (2008/2008).** Available online:  
<http://www.charmeck.org/Departments/StormWater/Contractors/Storm+Water+Design+Manual.htm#> (accessed 02/28/08)
  - **BMP Design Standards Manual (Mecklenburg County and Towns.** Available online:  
<http://www.charmeck.org/Departments/StormWater/Contractors/BMP+Standards+Manual.htm> (accessed 02/28/08)
  - **Zoning Ordinance.** Includes Watershed Overlay District regulations in Chapter 10 Overlay Districts. Available online:  
<http://www.charmeck.org/NR/rdonlyres/e3vlnqp7qgnh4igl4vo2uzpui2inesj4z3xfp44ewocyivxcp2iis7ustqo63lduoui3qolxlojz4w2d7nf4rdo4acg/ZoningOrdCityChapter10.pdf> (accessed 02/28/08)
  - **Surface Water Improvement and Management Ordinance.** Available online:  
<http://www.charmeck.org/NR/rdonlyres/evsplh4owyzn5uqtjndgcmqlddw7axuqi7k7ha4l7qijsa2jo73un6ijz4yau5gy46rg5vhaiw76dggkxfs7w6zpeoh/County.pdf> (accessed 02/28/08).
  - **SWIM Implementation Guidelines.** Explains how SWIM Ordinances are applied. Applicable to all of Mecklenburg County, the City of Charlotte, and Towns of Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville. Available online:  
<ftp://ftp1.co.mecklenburg.nc.us/WaterQuality/SWIM%20Implementation%20Guidelines%20Revised%202-25-08.doc> (accessed 02/28/08).

**State of North Carolina**

- **Water Supply Watershed Protection Rules.** See Water Supply Watershed Protection website: <http://h2o.enr.state.nc.us/wswp/> (accessed 02/28/08)
- **Catawba River Riparian Buffer Protection Rules 15A NCAC 02B .0243.** North Carolina Administrative Code available online: <http://reports.oah.state.nc.us/ncac.asp> (accessed 02/28/08)
- **Historic Preservation GS 121-12(a).** North Carolina General Statutes available online: <http://www.ncleg.net/gascripts/Statutes/StatutesTOC.pl> (accessed 02/28/08)
- **Minimum Discharge Criteria 15A NCAC 2T .305.** North Carolina Administrative Code available online: <http://reports.oah.state.nc.us/ncac.asp> (accessed 02/28/08)