



May 12, 2011

Alliance Consulting Engineers, Inc.
Post Office Box 8147
Columbia, South Carolina 29202-8147

Attention: Ms. Rebecca Murrell

Reference: Protected Species Assessment
Conder MEGA Site
U.S. Highway 601 at Interstate 20
Lugoff, Kershaw County, South Carolina
S&ME Project No. 1614-11-083

Dear Ms. Murrell:

S&ME, Inc. (S&ME) is pleased to submit our Protected Species Assessment for the above-referenced project located in Kershaw County, South Carolina. This work was performed in general accordance with S&ME Proposal No. 1614-7911-10, dated January 4, 2011 and the Master Services Agreement between Alliance Consulting Engineers and S&ME dated January 15, 2007.

1.0 PROJECT BACKGROUND

The project area is approximately 1,465-acres located northwest of the intersection of U.S. Highway 601 and Interstate 20 near Lugoff, Kershaw County, South Carolina as depicted on the Vicinity Map (Figure 1 in Appendix A). The site is identified on a portion of the USGS 7.5-minute topographic quadrangle map, Lugoff, SC, and dated 1953 (Figure 2 in Appendix A). This Protected Species Assessment has been conducted to assess the potential for the presence of protected species within the project area in preparation for the proposed industrial park improvements.

2.0 SITE/HABITAT DESCRIPTIONS

The project area is located in east-central Kershaw County within the Southeastern Plains/Sandhills ecoregion of South Carolina. The site is currently used for silvicultural purposes and a small portion is used as a sand mine. The properties adjacent to the project area consist of forestland, residential parcels, commercial businesses, and industrial facilities.

The site primarily consists of five habitat types: pine stands, pine-mixed hardwood woodland, mixed hardwood woodland, forested wetlands, drainage features and ponds. Refer to the Aerial Map (Figure 3) and site photographs in Appendix A for the locations and depictions of the various habitats.

Pine Stands (Photographs 1-2)

Sections of the northern, central, and eastern portions of the site consisted of planted pine stands of loblolly pine (*Pinus taeda*) and longleaf pine (*P. palustris*). The pine stands ranged in height from approximately 30-45 feet. Understory species were sparse and included turkey oak (*Quercus laevis*), blackjack oak (*Q. marilandica*), southern red oak (*Q. falcata*), water oak (*Q. nigra*), post oak (*Q. stellata*), blackberry (*Rubus* spp.), and yellow jessamine (*Gelsemium sempervirens*).

Pine-Mixed Hardwood Woodland (Photographs 3-4)

Pine-mixed hardwood communities were observed in multiple locations throughout the site. Dominant species included loblolly pine, longleaf pine, hickory (*Carya* spp.), the various oaks, blueberry (*Vaccinium* spp.), muscadine (*Vitis rotundifolia*), yellow jessamine, broomsedge (*Andropogon* spp.), and bracken fern (*Pteridium aquilinum*).

Mixed Hardwood Woodland (Photograph 5)

Pure hardwood communities were observed in multiple locations throughout the site. A few areas contained mature stands with the canopy reaching approximately 80 feet in height. Other areas have been clear-cut or have secondary growth hardwoods (10-15 feet tall). Dominant species included hickory, oak, flowering dogwood (*Cornus florida*), black cherry (*Prunus serotina*), persimmon (*Diospyros virginiana*), red maple (*Acer rubrum*), American holly (*Ilex opaca*), muscadine, yellow jessamine, spotted wintergreen (*Chimaphila maculata*), and bracken fern.

Forested Wetlands (Photographs 6-8)

Forested wetlands, often surrounding the various drainage features, were observed throughout the site. Isolated wetlands were limited to the northern portion of the site. Pocosin, streamhead pocosin, and seepage pocosin communities were among the specific forested wetland areas observed. Dominant tree and sapling species observed in the wetland areas included pond pine (*P. serotina*), loblolly pine, sweet-gum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), red bay (*Persea borbonia*), swamp red bay (*P. palustris*), and red maple. Shrub, woody vine, and herbaceous species included ti-ti (*Cyrilla racemiflora*), inkberry (*I. glabra*), sweet gallberry (*I. coriacea*), Chinese privet (*Ligustrum sinense*), switch cane (*Arundinaria gigantea*), greenbrier (*Smilax rotundifolia*), laurel-leaf greenbrier (*S. laurifolia*), blackberry, cinnamon fern (*Osmunda cinnamomea*), and peat moss (*Sphagnum* spp.).

Drainage Features and Ponds (Photographs 9-10)

Multiple perennial drainage features were observed throughout the site. Much of Gillies Creek along the southern site boundary has been impounded to create two large ponds. A smaller pond (almost dry during our site visit) was observed on the northwestern portion of the site. Sandy substrates were observed in the streambeds. Floating aquatic vegetation was observed within the two ponds on the southern portion of the site.

3.0 METHODS

The South Carolina Department of Natural Resources (SCDNR) Rare, Threatened, and Endangered Species Inventory and the U.S. Fish and Wildlife Service (USFWS) websites were reviewed regarding current federally listed species known to occur in Kershaw County. The purpose of the database search was to identify current and historic documented occurrences of federally protected species located within this county.

Additionally, S&ME personnel reviewed available supporting information including the previously-mentioned USGS topographic quadrangles and applicable soil survey sheets. The purpose of reviewing this supporting information was to identify drainage features and soil types in the study area. During the field reconnaissance, S&ME personnel integrated the information obtained from this supporting documentation with the field evaluation. Portions of the site that matched descriptions of preferred habitat for protected species listed in Table 1 were considered to be potential habitat for the respective protected species. These areas were subsequently field reviewed to confirm the presence/absence of the species. Biologists Amanda White and Chris Daves of S&ME performed a field survey for the protected species in suitable habitats on numerous dates in March, April, and May of 2011.

The SCDNR database records did not identify the presence of known federally protected species (threatened or endangered) occurrences on or immediately adjacent to the project area.

4.0 PROTECTED SPECIES

Descriptions of the species and their respective federal status are identified in Table 1 and in Appendix B. The SCDNR and USFWS websites identified the following federally listed species for Kershaw County:

Table 1: Protected Flora and Fauna Summary

Species	Federal Status	Habitat Description	Habitat Impacted
Bald Eagle <i>Haliaeetus leucocephalus</i>	BGEPA	Coastlines, rivers, large lakes which provide adequate feeding grounds.	No
Red-Cockaded Woodpecker <i>Picoides borealis</i>	E	Open pine stands with minimum age of 60 years; Nests in live pines with red-heart disease.	No
Carolina Heelsplitter <i>Lasmigona decorata</i>	E	Cool, slow-moving, small to medium sized streams & rivers; Usually found in mud, muddy sand, or muddy gravel substrates along stable, well shaded stream banks. Slate belt geology also associated with species.	No
Michaux's Sumac <i>Rhus michauxii</i>	E	Sandy or rocky open woods in association with acidic soils, open disturbed areas, along forest edges and maintained rights-of-way.	No

BGEPA = Bald & Golden Eagle Protection Act

E = Endangered

Bald Eagle – Protected Under the Bald & Golden Eagle Protection Act

BIOLOGICAL OPINION: NO EFFECT

This large raptor has characteristic adult plumage consisting of a white head and tail with a dark brown body. Juvenile eagles are completely dark brown and do not fully develop the majestic white head and tail until the fifth or sixth year. Adults average about three feet from head to tail, weigh approximately 10 to 12 pounds and have a wingspread that can reach seven feet. Generally, female bald eagles are somewhat larger than the males. The typical nest is constructed of large sticks and is lined with soft materials such as pine needles and grasses. The nests are very large, measuring up to six feet across and weighing hundreds of pounds. Nesting and feeding sites are generally in the vicinity of large bodies of open water (coastlines, rivers, large lakes).

The areas surrounding the two ponds on the southeastern portion of the site are potential habitat for bald eagle. S&ME searched the tree tops within the project area and adjacent areas to the south. No bald eagle nests were observed. Accordingly, future development of the project area is not expected to impact this species.

Red-Cockaded Woodpecker – Federally Listed Endangered

BIOLOGICAL OPINION: NO EFFECT

The red-cockaded woodpecker is a black and white bird measuring approximately seven inches long. The bird displays black and white horizontal stripes on its back. The cheeks and underparts are white and the sides are streaked in black. The cap and stripe on the throat and neck of the bird are black. Male individuals of the species have a small red spot on each side of the black cap and display a red crown patch after the first post-fledgling molt.

The red-cockaded woodpecker's range is closely linked to the distribution of southern pines. Loblolly and longleaf pines that are 60-plus years old are generally selected for nesting sites. However, other species of southern pines are occasionally used for nesting. The woodpecker usually excavates nest cavities in trees infected with a fungus that produces red-heart disease. Preferred nesting sites generally include relatively open, mature pine stands with an undeveloped or low understory layer. Foraging habitat is frequently limited to pine or pine-hardwood stands that are 30 years or older, with a preference for pine trees with a diameter of 10 inches or larger. The USFWS indicates that the maximum foraging range for the red-cockaded woodpecker is approximately one-half mile.

The project area does not contain suitable nesting habitat for the red-cockaded woodpecker. Although there are abundant pine stands, there are no relatively open pine stands of proper age to be considered suitable habitat for the red-cockaded woodpecker located within the project area. Accordingly, future development of the project area is not expected to impact this species.

Carolina Heelsplitter – Federally Listed Endangered

BIOLOGICAL OPINION: NO EFFECT

The Carolina heelsplitter is a medium-sized freshwater mussel with an ovate, trapezoid-shaped shell. The shell is yellowish, greenish-brown to dark brown in color. The inside of the shell (nacre) is pearly-white to bluish-white. The umbo area is orange or a mottled-orange. The heelsplitter has been documented in Catawba, Pee Dee, and Savannah River basins in South Carolina. The Saluda River basin is listed as a possible location for the heelsplitter. The Carolina heelsplitter has been recorded in a variety of substrates, including mud, clay, sand, gravel, and cobble/bolder/bedrock. The species habitat is often associated with slate belt geology. A majority of these areas are without significant silt accumulations and are along stable, well-shaded stream banks. Habitat is severely affected by siltation.

The project area does not contain suitable habitat for Carolina heelsplitter. The project area is located in the Sandhills area of Kershaw County, and not located in a slate belt geologic area. Accordingly, future development of the project area is not expected to impact this species. Please note that an official mussel survey was not conducted as part of this assessment.

Michaux's Sumac – Federally Listed Endangered

BIOLOGICAL OPINION: NO EFFECT

Michaux's sumac is a dense, hairy shrub with erect stems that are one to three feet tall. The shrub's compound leaves are narrowly winged at their base, dull on their tops, and veiny and slightly hairy on their bottoms. Each leaf is finely toothed on its edges. Flowers are greenish-yellow to white. The plant flowers from April to June. Its fruit, a dull red drupe, is produced in October and November. This species prefers the droughty, full sun areas that have limited competition from taller plants. The habitat for Michaux's sumac includes sandy or rocky open woods in association with basic soils, open disturbed areas, along forest edges and maintained rights-of-way.

Despite the endangered listing in Kershaw County, species accounts from USFWS (1993) and NatureServe (2011) indicate that Michaux's sumac has been extirpated (eliminated) from South Carolina. There are no living documented populations of this species in Kershaw County. Michaux's sumac was not observed along the utility easements, roadsides, open woodland areas, or woodland edges during our site reconnaissance. Accordingly, future development of the project area is not expected to impact this species.

5.0 QUALIFICATIONS

The field survey was lead by Chris Daves of S&ME. Mr. Daves is a biologist and natural resources project manager with over 10 years experience in environmental consulting. He is a Professional Wetland Scientist (PWS) and holds a B.S. degree in Biology from Wofford College and a Master’s degree in Earth & Environmental Resources Management from the University of South Carolina. Mr. Daves is proficient in conducting wetland delineations, environmental permitting activities, and habitat assessments, including protected species surveys.

6.0 REFERENCES

- Cummings, Candace J. and G.K. Yarrow. 1996. A Guide to South Carolina’s Endangered and Threatened Species – EC 693. Clemson Extension Service.
- NatureServe. <http://www.natureserve.org/>. Accessed May 6, 2011.
- Nelson, John B. 1986. The Natural Communities of South Carolina – Initial Classification and Description. S.C. Wildlife and Marine Resources Department.
- SCDNR. April 15, 2010. Rare, Threatened, and Endangered Species and Communities Known to Occur in Kershaw County, SC - <http://www.dnr.sc.gov/species/pdf/kershaw.pdf>. Accessed May 6, 2011.
- South Carolina Heritage Trust. 2006. Geographic Database of Rare and Endangered Species. Current On-Line Edition - <https://www.dnr.sc.gov:4443/pls/heritage/species.login>. May 6, 2011.
- USFWS. February 16, 2011. Listed Endangered Species in South Carolina - <http://www.fws.gov/charleston/countyLists.html#Listed%20Species%20in%20Kershaw%20County>. Accessed May 6, 2011.
- U.S. Department of Agriculture – National Resources Conservation Service Web Soil Survey. 2011. <http://websoilsurvey.nrcs.usda.gov/app/>. Accessed May 6, 2011.
- USFWS. April 30, 1993. Recovery Plan for Michaux’s Sumac (*Rhus michauxii*).
- USFWS. April 2010. South Carolina List of Endangered, Threatened & Candidate Species. <http://www.fws.gov/charleston/pdf/endangeredSpeciescountylist.pdf>. Accessed May 6, 2011.

7.0 SUMMARY AND CONCLUSIONS

Based on the literature review, habitat assessment, and pedestrian field review of the site, it is our opinion that the site does not provide suitable habitat, except for bald eagle near the ponds, for listed federally-protected species with documented populations in Kershaw County. The pedestrian field review did not reveal the presence of listed federally-protected species on the site. No further action is recommended at this time. This Protected Species Assessment will be forwarded to the USFWS for review and comment. The comments will be provided to you as soon as S&ME receives them.

8.0 CLOSING

S&ME appreciates the opportunity to be of service to you by performing this Protected Species Assessment for the site. Please contact us at (803) 561-9024 with questions regarding this report or if you require additional information.

Sincerely,

S&ME, Inc.


Amanda White
Biologist


Chris Daves, P.W.S.
Biologist

Senior Reviewed by Tom Behnke, P.G.

Appendix A

Figures
Site Photographs

Appendix B

County Species Lists from USFWS and SCDNR

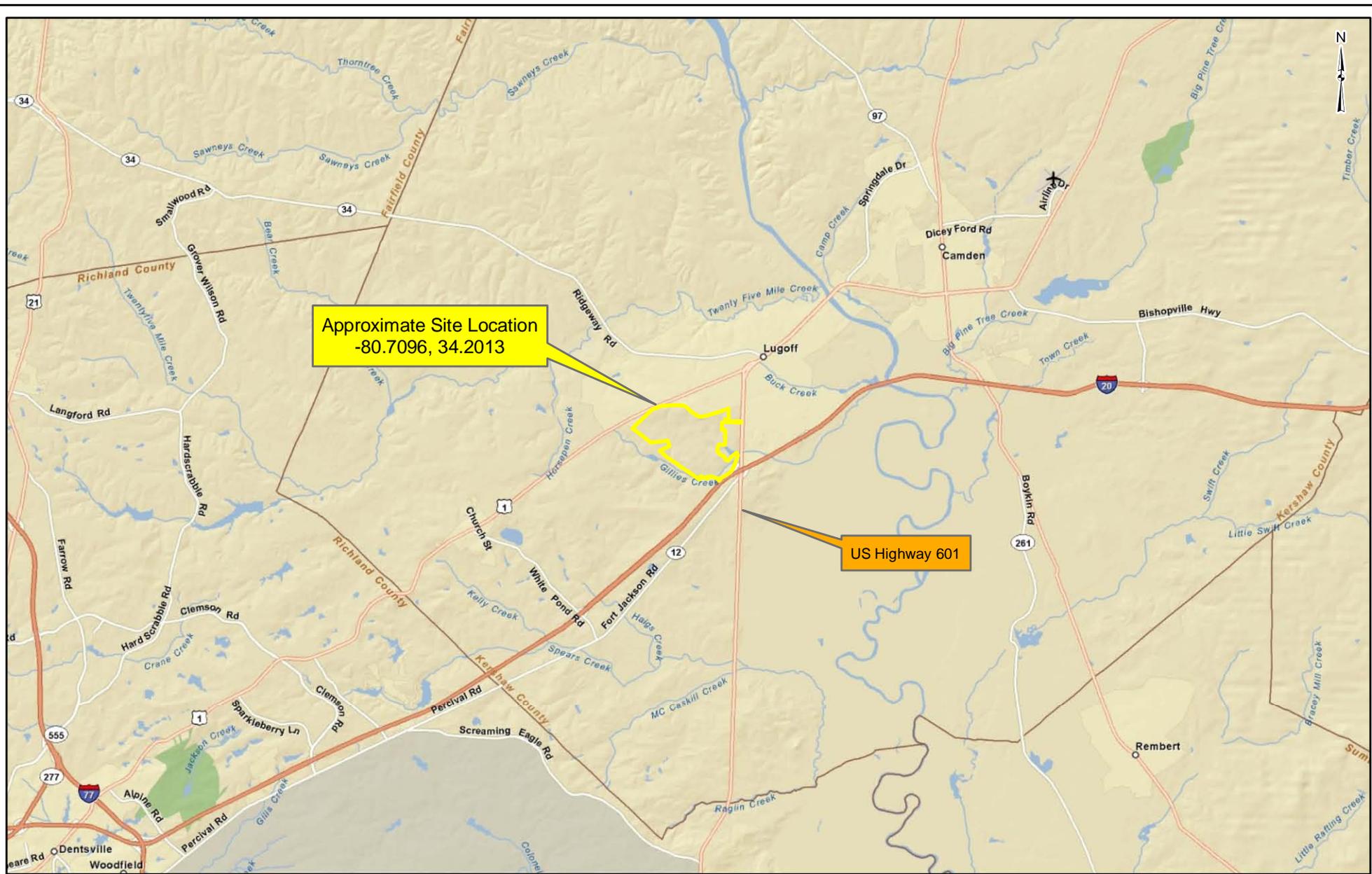
APPENDIX A

Figure 1 – Vicinity Map

Figure 2 – USGS Topographic Map

Figure 3 – Aerial Map

Site Photographs



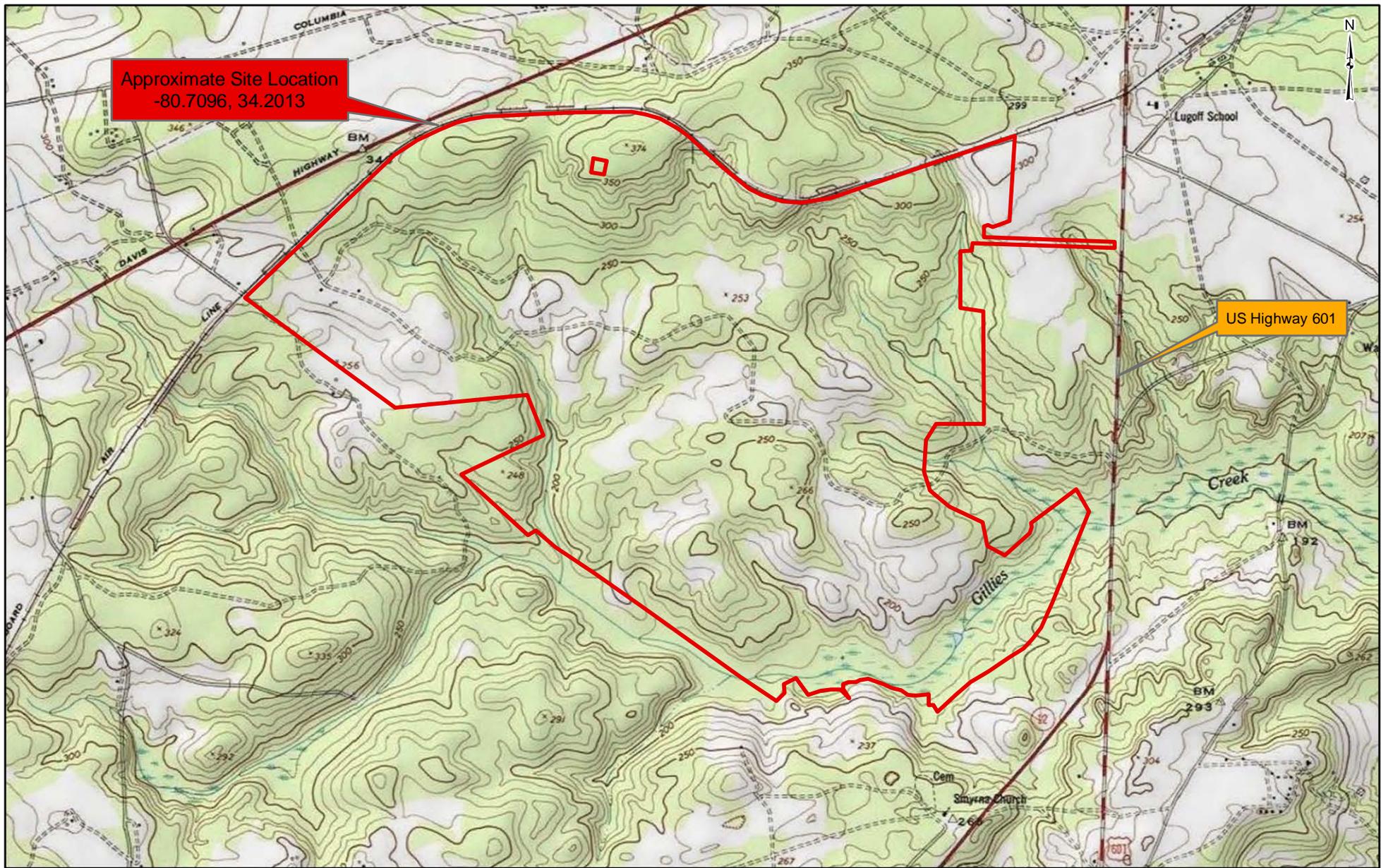
Source: ESRI Streetmap - 2010



SCALE:	1 inch = 3 miles
CHECKED BY:	TB
DRAWN BY:	WCD
DATE:	5/12/2011



Vicinity Map		FIGURE NO. 1
Conder MEGA Site ~ 1,465 acres Lugoff, Kershaw County, South Carolina		
S&ME PROJECT NO.	1614-11-083	



Source: USGS 7.5-minute quadrangle
Lugoff, SC - 1953

0 750 1,500 3,000 4,500 6,000 Feet

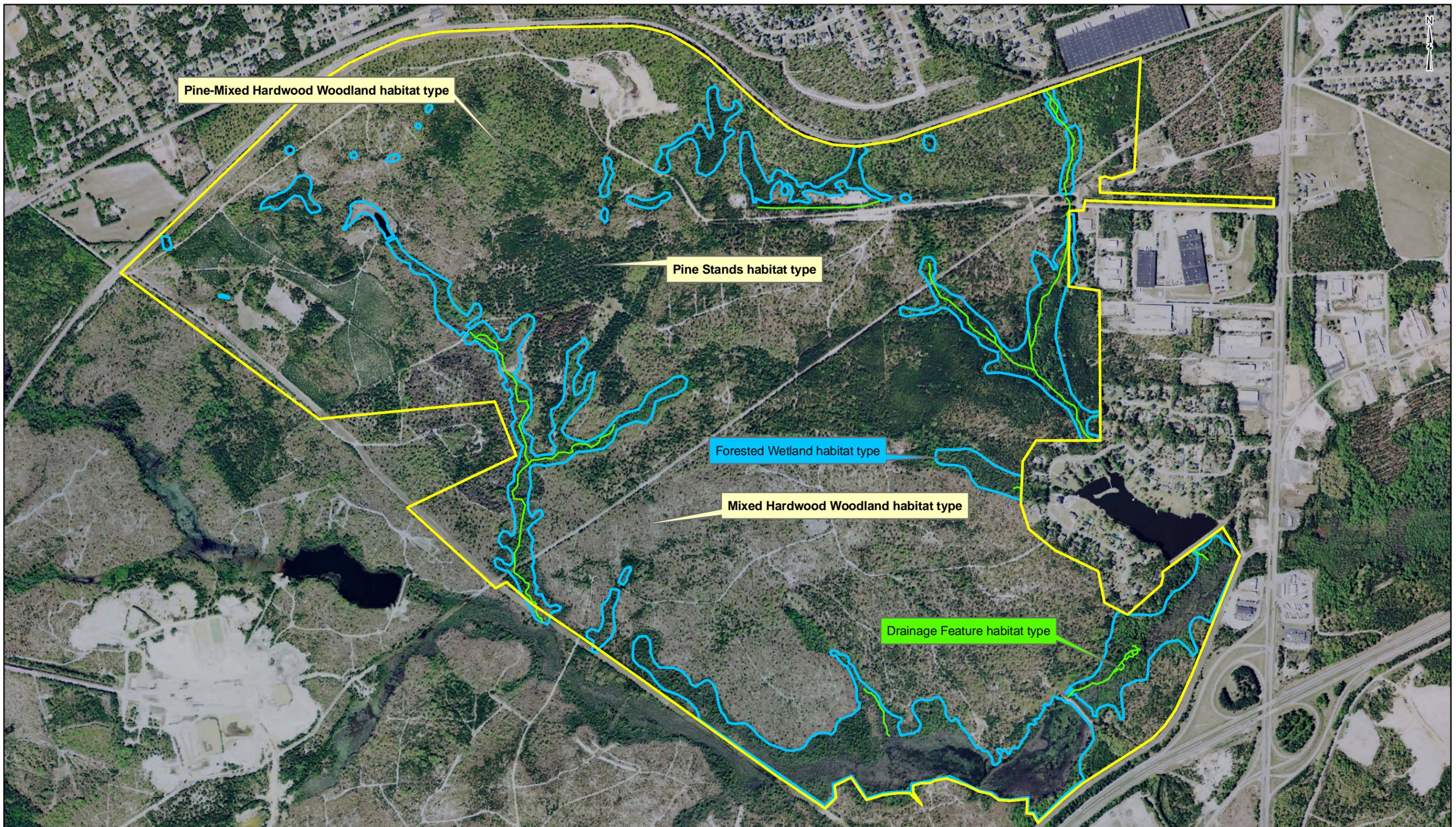
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CHECKED BY:	TB
DRAWN BY:	WCD
DATE:	5/12/2011



Topographic Map
 Conder MEGA Site ~ 1,465 acres
 Lugoff, Kershaw County, South Carolina

S&ME PROJECT NO. 1614-11-083

FIGURE NO.
2



SCALE:	1 in = 1,000 ft
CHECKED BY:	TB
DRAWN BY:	WCD
DATE:	5/12/2011



Aerial Map
 Conder MEGA Site ~1,465 Acres
 Lugoff, Kershaw County, South Carolina

S&ME PROJECT NO. 1614-11-083

FIGURE NO.
3

Source: ESRI Web Resources
 NAIP - 2009

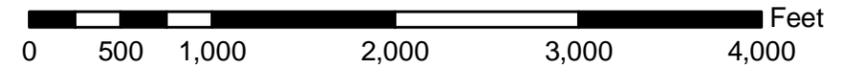




Photo #1 Planted longleaf pine stands on northwestern portion of site.



Photo #2 Planted pine stands on east-central portion of site along gas easement.



Photo #3 Pine-mixed hardwood community typical of site.



Photo #4 Pine-mixed hardwood community on northern portion of site.



Photo #5 Mixed hardwood community on northwestern portion of site.



Photo #6 Forested wetland on northern portion of site.



Photo #7 Forested wetland on western portion of site.



Photo #8 Pocosin type wetland on northern portion of site.



Photo #9 Typical perennial stream on site. Stream was observed on western portion of site.



Photo #10 Pond located on southern portion of site.

APPENDIX B

**County Species Lists from USFWS and SCDNR
For Kershaw County**

**South Carolina List of Endangered, Threatened and Candidate Species
April 2010**

E	Federally endangered
T	Federally threatened
P	Proposed in the Federal Register
CH	Critical Habitat
C	The U.S. Fish and Wildlife Service or the National Marine Fisheries Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
S/A	Federally protected due to similarity of appearance to a listed species
*	Contact the National Marine Fisheries Service for more information on this species
**	The U.S. Fish and Wildlife Service and the National Marine Fisheries Service share jurisdiction of this species
BGEPA	Federally protected under the Bald and Golden Eagle Protection Act

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated continually and may be different from the following. For a list of state endangered, threatened, and species of concern go to <http://www.dnr.sc.gov/species/index.html>.

<u>COUNTY</u>	<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS</u>
Abbeville	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Carolina heelsplitter	<i>Lasmigona decorata</i>	E
	Georgia aster	<i>Aster georgianus</i>	C
Aiken	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Piedmont bishop-weed	<i>Ptilimnium nodosum</i>	E
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
	Relict trillium	<i>Trillium reliquum</i>	E
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E
	Smooth coneflower	<i>Echinacea laevigata</i>	E
Allendale	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Canby's dropwort	<i>Oxypolis canbyi</i>	E
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E
	Smooth coneflower	<i>Echinacea laevigata</i>	E
Anderson	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Smooth coneflower	<i>Echinacea laevigata</i>	E

<u>COUNTY</u>	<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS</u>
Horry Continued	Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E
	West Indian manatee	<i>Trichechus manatus</i>	E
	Wood stork	<i>Mycteria americana</i>	E
Jasper	American chaffseed	<i>Schwalbea americana</i>	E
	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Canby's dropwort	<i>Oxypolis canbyi</i>	E
	Finback whale	<i>Balaenoptera physalus</i> *	E
	Frosted flatwoods salamander	<i>Ambystoma cingulatum</i>	T, CH
	Green sea turtle	<i>Chelonia mydas</i> **	E
	Humpback whale	<i>Megaptera novaengliae</i> *	E
	Kemp's ridley sea turtle	<i>Lepidochelys kempii</i> **	E
	Leatherback sea turtle	<i>Dermochelys coriacea</i> **	E
	Loggerhead sea turtle	<i>Caretta caretta</i> **	T
	Piping plover	<i>Charadrius melodus</i>	T, CH
	Pondberry	<i>Lindera melissifolia</i>	E
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
	Red knot	<i>Calidris canutus rufa</i>	C
	Right whale	<i>Balaena glacialis</i> *	E
	Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E
West Indian manatee	<i>Trichechus manatus</i>	E	
Wood stork	<i>Mycteria americana</i>	E	
Kershaw	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Carolina heelsplitter	<i>Lasmigona decorata</i>	E, CH
	Georgia aster	<i>Aster georgianus</i>	C
	Michaux's sumac	<i>Rhus michauxii</i>	E
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
Lancaster	Black-spored quillwort	<i>Isoetes melanospora</i>	E
	Carolina heelsplitter	<i>Lasmigona decorata</i>	E, CH
	Little amphianthus	<i>Amphianthus pusillus</i>	T
	Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	E
	Smooth coneflower	<i>Echinacea laevigata</i>	E
Laurens	Carolina heelsplitter	<i>Lasmigona decorata</i>	E
	Georgia aster	<i>Aster georganus</i>	C
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E

Rare, Threatened, and Endangered Species and Communities Known to Occur in Kershaw County, South Carolina
April 15, 2010

Scientific Name	Common Name	USESAs Designation	State Protection	Global Rank	State Rank
<u>Vertebrate Animals</u>					
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat		SE-Endangered	G3G4	S2?
<i>Elassoma boehlkei</i>	Carolina Pygmy Sunfish		ST-Threatened	G2	S1
<i>Etheostoma flabellare</i>	Fantail Darter			G5	S1
<i>Haliaeetus leucocephalus</i>	Bald Eagle		SE-Endangered	G5	S2
<i>Hyla andersonii</i>	Pine Barrens Treefrog		ST-Threatened	G4	S2S3
<i>Myotis austroriparius</i>	Southeastern Bat			G3G4	S1
<i>Picoides borealis</i>	Red-cockaded Woodpecker	LE: Listed endangered	SE-Endangered	G3	S2
<i>Puma concolor</i>	Mountain Lion			G5	SH
<i>Sciurus niger</i>	Eastern Fox Squirrel			G5	S4
<i>Semotilus lumbee</i>	Sandhills Chub			G3	S2
<u>Invertebrate Animals</u>					
<i>Elliptio congaraea</i>	Carolina Slabshell			G3	S3
<i>Lasmigona decorata</i>	Carolina Heelsplitter	LE: Listed endangered	SE-Endangered	G1	S1
<u>Animal Assemblage</u>					
Waterbird Colony				GNR	SNR
<u>Vascular Plants</u>					
<i>Anemone berlandieri</i>	Southern Thimble-weed			G4?	S1
<i>Anemone caroliniana</i>	Carolina Anemone			G5	SH
<i>Draba aprica</i>	Open-ground Whitlow-grass			G3	S1
<i>Isoetes piedmontana</i>	Piedmont Quillwort			G3	S2
<i>Kalmia cuneata</i>	White-wicky			G3	S2
<i>Litsea aestivalis</i>	Pondspice			G3	S3
<i>Minuartia uniflora</i>	One-flower Stitchwort			G4	S3
<i>Myriophyllum laxum</i>	Piedmont Water-milfoil			G3	S2
<i>Nestronia umbellula</i>	Nestronia			G4	S3
<i>Nolina georgiana</i>	Georgia Beargrass			G3G5	S3
<i>Portulaca umbraticola</i>	Wing-podded Purslane			G5	S1
<i>Quercus georgiana</i>	Georgia Oak			G3	S1
<i>Rhus michauxii</i>	Michaux's Sumac	LE: Listed endangered		G2G3	SX

Scientific Name	Common Name	USESAs Designation	State Protection	Global Rank	State Rank
<i>Scirpus etuberculatus</i>	Canby Bulrush			G3G4	SNR
<i>Sedum pusillum</i>	Granite Rock Stonecrop			G3	S2
<i>Sporobolus teretifolius</i>	Wire-leaved Dropseed			G2	S1
<i>Syngonanthus flavidulus</i>	Yellow Pipewort			G5	S2
<i>Tofieldia glabra</i>	White False-asphodel			G4	S1S2
<i>Trillium lancifolium</i>	Narrow-leaved Trillium			G3	S1
<i>Viola pubescens</i> var. <i>leiocarpon</i>	Yellow Violet			G5T5	S2
<u>Communities</u>					
Atlantic white cedar swamp				G2	S2
Bottomland hardwoods				G5	S4
Non-alluvial swamp forest				G5	S4S5
Pine - scrub oak sandhill				G4	S4
Pond cypress pond				G4	S4
Seepage pocosin				G3	S1S2
Xeric sandhill scrub				G5	S3
<u>Ecological</u>					
Carolina bay				GNR	SNR
Granitic flatrock				G3	S2