

APPENDIX F
BIOLOGICAL ASSESSMENT

March 23, 2015

Mr. Barry Jurs
Economic Development Director
Berkeley County
1003 Highway 52
Moncks Corner, SC 29461



**Subject: Protected Species Biological Assessment
Camp Hall Tract
Berkeley County, South Carolina
Amec Foster Wheeler Project Number 6250140079**

Dear Mr. Jurs,

Amec Foster Wheeler Environment and Infrastructure, Inc. (Amec Foster Wheeler) is pleased to submit this report regarding the protected species assessment for the approximate 6,770-acre Camp Hall Site, located northwest of Ridgeville, in Berkeley County, South Carolina. The South Carolina Department of Commerce (SCDOC) is interested in developing this property for industrial development.

Introduction

Plants and animals listed as federally threatened and endangered are protected under the Endangered Species Act (P.L. 92-205) (ESA) which is administered and enforced by the United States Fish and Wildlife Service (USFWS). The bald eagle is federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. This biological assessment documents the results of a literature search, review of past biological assessments, and an on-site habitat assessment for federally endangered and threatened species and the bald eagle for the Camp Hall Tract in Berkeley County, South Carolina.

Consultation History

This biological assessment (BA) is an update to the BA written by Newkirk Environmental, Inc. dated January 2009 (Newkirk 2009) that accompanied public notice SAC-2008-0086-2G, MWV-Camp Hall, LLC; FWS Log No. 2015-CPA-0025. The Newkirk BA (2009) concluded "that activities on this tract are not likely to cause adverse effects to overall populations of any threatened or endangered species."

The USFWS response dated January 21, 2015 to the USACE stated that they concurred with the Newkirk BA findings. The USFWS letter stated “The Service concurs with your determination that this action is not likely to adversely affect federally endangered or threatened species or adversely modify designated critical habitat. In view of this, we believe that the requirements of section 7 of the ESA have been satisfied.”

Species to be Considered

A current list of federally endangered and threatened species for Berkeley County was compiled from the USFWS Charleston Field Office website in March 2015 and the USFWS Information Planning and Conservation System (IPAC) (March 2015). The list is in Table 1. The South Carolina Rare and Endangered Species Inventory website, a Geographic Information System natural resources data layer that includes the locations of all documented occurrences of federally endangered or threatened species, was reviewed for known occurrences of such species on or proximate to the subject project. There are no known occurrences of federally endangered or threatened species on the Pringletown, Ridgeville, and Summerville NW quadrangles in Berkeley County, SC.

Table 1. Current list of federally endangered, threatened, and candidate species in Berkeley County, South Carolina (USFWS 2015) and their habitat types.

| Common Name | Scientific Name | Status | General Habitat Type |
|------------------------------|---------------------------------|--------|--|
| West Indian manatee | <i>Trichechus manatus</i> | E | coastal waters |
| Frosted flatwoods salamander | <i>Ambystoma cingulatum</i> | T, CH | pine areas maintained in an open state by fire with isolated ponds for breeding sites |
| Bald eagle | <i>Haliaeetus leucocephalus</i> | BGEPA | coastlines, rivers, large lakes or streams |
| Red-cockaded woodpecker | <i>Picoides borealis</i> | E | mature pine forests |
| Wood stork | <i>Mycteria americana</i> | E | marshes, swamps, lagoons, ponds, flooded fields; depressions in marshes are important during drought; also occurs in brackish wetlands |
| Atlantic sturgeon | <i>Acipenser oxyrinchus</i> | E | major river systems along the eastern seaboard |
| Shortnose sturgeon | <i>Acipenser brevirostrum</i> | E | major river systems along the eastern seaboard |
| Pondberry | <i>Lindera melissifolia</i> | E | swamp and pond margins, sandy sinks, swampy depressions, wet flats |
| Canby’s dropwort | <i>Oxypolis canbyi</i> | E | pond-cypress savannahs dominated by grasses, sedges or ditches next to bays; borders and shallows of cypress-pond pine ponds and sloughs |
| American chaffseed | <i>Schwalbea americana</i> | E | fire maintained open pine forest |

| | |
|-------|--|
| E | Federally endangered |
| T | Federally threatened |
| CH | Critical habitat |
| BGEPA | Federally protected under the Bald and Golden Eagle Protection Act |

Methodology

Amec Foster Wheeler conducted a literature search, desktop habitat assessment, a review of the previous BA (Newkirk 2009) and on-site ground-truthing to determine the likelihood of the presence or absence of each of the above listed species and if the conclusions/findings of the previous BA have changed over time. The above list was used as the baseline for the on-site habitat assessment and survey. Aerial photography and ground-truthing was used to generalize habitat types on the site. General habitat types located on the tract are described below in the Habitats section. There are approximately 54 areas that could be characterized as seasonally to permanently flooded wetland depressions (isolated ponds) on-site. We conducted an on-site inspection of 35 of these isolated ponds (~65%). On-site field work was conducted from March 2 – 5, 2015.

Habitat

Based on review of aerial photography, forest stand maps, the previous BA (Newkirk 2009), and ground-truthing the 6,770.8-acre site contains six general habitat types: loblolly pine plantation, longleaf pine plantation, isolated ponds, mixed pine-hardwood forest, and power line right-of-way (ROW). The entire site is intensely managed for timber production (e.g., bedding, planting pines, ditching) with no evidence of recent fire management. The powerline right-of-way was not reviewed for protected species since these habitats do not constitute suitable habitat for any protected species known to occur in Berkeley County.

Loblolly pine plantation

The site is dominated by even-aged planted pine stands ranging from one to 40 year old loblolly pine (*Pinus teada*). Saplings and shrubs in these areas vary in percent cover based on age of the pine and when the stand was thinned. Saplings and shrubs include loblolly pine, sweet gum (*Liquidambar styraciflua*), red bay (*Persea borbonia*), sweet bay (*Magnolia virginiana*), wax myrtle (*Morella cerifera*), red maple (*Acer rubrum*), fetterbush (*Lyonia lucida*), and high bush blueberry (*Vaccinium corymbosum*). The herbaceous layer was nearly absent in all of the stands except the newly cut and planted stands. In those stands the herbaceous layer included planted loblolly pine, broom sedge (*Andropogon virginicus*), bushy bluestem (*A. glomeratus*), dog fennel (*Eupatorium capillifolium*), black berry (*Rubus spp.*), panic grass (*Panicum spp.*), St. John's wort (*Hypericum hypericoides*), and bracken fern (*Pteridium aquilinum*).

Longleaf pine plantation

There is one small stand of planted longleaf pine (*Pinus palustris*) in the northeast section of the site along Fish Road. There is approximately 20% overstory of longleaf pine and 10% overstory of loblolly pine. Saplings and shrubs include sweet gum, inkberry (*Ilex glabra*), wax myrtle, high bush blueberry, horse sugar (*Symplocos tinctoria*), and sweet pepperbush (*Clethra alnifolia*). The herbaceous layer included bracken fern and heavy pine straw.

Isolated ponds

Isolated ponds are seasonally to permanently flooded wetland depressions. The on-site ponds are dominated by a nearly closed canopy of hardwoods including sweet gum, red maple, water oak (*Quercus nigra*), diamond-leaf oak (*Q. laurifolia*), pond pine. Swamp blackgum (*Nyssa biflora*) was only observed in a couple of ponds. The edges of these ponds were densely vegetated with shrubby species including fetterbush, sweet bay, sweet pepperbush, inkberry, red bay, wax myrtle, cane (*Arundinaria gigantea*) and a very few grasses. Many of the ponds that appeared isolated were depressional landforms in larger wetland systems or connected to Timothy Creek and other wetlands via the ditch system.

Mixed pine hardwood forest

There are several wetland areas classified as mixed hardwood pine forests associated with Timothy Creek. Timothy Creek is deeply incised and channelized in this area. These areas are dominated by sweet gum, red maple, water oak, diamond-leaf oak, and loblolly pine. The sapling and shrub layer is dominated by fetterbush, sweetbay magnolia, sweet pepperbush, wax myrtle, high bush blueberry, American holly (*Ilex opaca*). The herbaceous layer included cinnamon fern (*Osmunda cinnamomea*) and a few sedges (*Carex* spp.).

Literature Search and On-site Survey Results

West Indian manatee

The West Indian manatee was listed as endangered on March 11, 1967 (USFWS 1967). It is a large gray or brown aquatic mammal averaging 10 feet long and weighing about 1,000 pounds (USFWS 1992a). During the winter months, the United States' manatee population confines itself to the coastal waters of the southern half of peninsular Florida and to springs and warm water outfalls as far north as southeast Georgia. During the summer months, they may migrate as far north as coastal Virginia on the east coast and the Louisiana coast on the Gulf of Mexico (USFWS 1992a). The West Indian manatee inhabits both salt and fresh water and may be encountered in canals, rivers, estuarine habitats, and saltwater bays (USFWS 1992a).

None of these habitat types occur on the site.

Frosted flatwoods salamander

The flatwoods salamander was listed as threatened on April 1, 1999 (USFWS 1999b). In 2009 the flatwoods salamander was divided into two distinct species: the frosted flatwoods salamander (*Ambystoma cingulatum*) and the reticulated flatwoods salamander (*Ambystoma bishopi*) due to a recognized taxonomic reclassification (USFWS 2009). The frosted flatwoods salamander is located east of the Apalachicola River Basin. Critical habitat (CH) has been designated for the frosted flatwoods salamander in Berkeley, Charleston, and Jasper counties, SC (USFWS 2009) but the closest designated CH is over 20 miles away on the Francis Marion National Forest (FMNF). The frosted flatwoods salamander occurs in isolated populations scattered across the lower southeastern Coastal Plain in Florida, Georgia, and South Carolina (USFWS 1999b, USFWS 2009). There are four known populations of frosted flatwoods salamander in South Carolina (USFWS 2009) with the closest population over 20 miles away on the FMNF.

It is a slender, small-headed mole salamander. Adult dorsal color ranges from dark black to chocolate black with grayish or silvery network pattern or frosted appearance running along the lateral and dorsal surfaces. Aquatic larvae are long and slender, broad-headed and bushy-gilled, with white bellies and yellow stripes on the sides (Palis 1995).

Typical breeding sites are isolated wetland depressions, which dry completely on a cyclic basis, thus eliminating fish species. The isolated ponds are typically small with an open canopy allowing grasses and sedges to grow on the edge where adult salamanders will lay their eggs in the fall. During the non-breeding season, the fossorial adults return to the upland pine areas that are maintained by frequent fire.

The habitat on-site does not meet the criteria for this species because (1) the ponds have a fairly closed canopy, (2) many of the ponds are not truly isolated but connected to larger wetlands via a large ditch system, (3) the upland pine habitat has not been burned or allowed to mature and will not support the adults.

Bald eagle

The bald eagle was listed as endangered on March 11, 1967 (USFWS 1967). The species was reclassified from endangered to threatened throughout the lower 48 states on July 12, 1995 (USFWS 1995). It was proposed to be removed from the federal endangered species list on July 6, 1999 (USFWS 1999a). On July 9, 2007, the bald eagle was removed from the endangered species list (USFWS 2007). The bald eagle is still federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

The bald eagle, with a wingspread of about seven feet, is mainly dark brown and adults have a pure white head and tail. The bald eagle feeds primarily on fish but also takes a variety of bird,

mammals, and turtles when fish are not readily available (USFWS 1992a). It nests in large, sturdy trees with open canopies typically near large open water bodies. Many nests are used annually. It has been documented that egg laying for the bald eagle peaks in late December in the South. The nesting season in the Southeast extends from October to May 15.

Based on review of the SCDNR Heritage Trust Database (SCDNR 2015) the closest known bald eagle nest is more than 10 miles to the northeast in on Lake Moultrie. In addition, there is no open water within ½ mile of the site. Therefore, based on lack of suitable nesting or foraging habitat and the closest known nest being over 10 miles away, it is unlikely that the proposed project will disturb the bald eagle.

Red-cockaded woodpecker (RCW)

In 1970, the RCW was officially listed as endangered (USFWS 2003). With passage of the ESA in 1973, the RCW received the protection afforded listed species under the ESA. The endangered status of the RCW primarily is due to four environmental factors that have been shown to limit its numbers: (1) hardwood encroachment; (2) a shortage of suitable cavity trees; (3) loss and fragmentation of habitat, and (4) demographic isolation (Conner and Rudolph 1991, Walters 1991, Rudolph and Conner 1994).

The RCW is endemic to pine forests of the southeast (Ligon 1970). RCWs are territorial, non-migratory, cooperative breeders (Lennartz et al. 1987). RCWs are unique in that they excavate cavities for roosting and nesting in living pines (USFWS 2003) and use living pines almost exclusively for foraging substrate, preferring longleaf pine when available (Walters 1991). RCWs require open pine woodlands and savannahs with large old pines for nesting and roosting habitat (i.e., cavity trees). Cavity trees must be in open pine stands with little or no hardwood midstory and few or no over-story hardwoods. For purposes of surveying, suitable nesting habitat consists of pine, pine/hardwood, and hardwood/pine stands that contain pines 60 years in age or older and that are within 0.5 mile of suitable foraging habitat. For the purposes of surveying, suitable foraging habitat consists of a pine or pine/hardwood stand in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 30 years in age or older. (USFWS 2003)

Based on review of aerial photography, review of the previous BA (Newkirk 2009) and an on-site visit, it was determined that marginal suitable foraging and nesting habitat for the RCW is onsite. However, there is no evidence of burning or mechanical mid-story control on any of the pine areas. The few stands of mature pines have a dense mid-story, the remaining pine plantations are too young and/or too thick to be considered RCW habitat. The long leaf pine stand in the northeast corner of the property was surveyed for evidence of RCW cavity trees. No cavity trees were located. In addition, the closest known RCW clusters are more than 10 miles northeast on the Brosnan Forest.

Wood stork

The U.S. breeding population of the wood stork was listed as endangered on February 28, 1984 (USFWS 1992a). The U.S. breeding population was down-listed to threatened and established as a distinct population segment on July 30, 2014. Wood storks are large, long-legged wading birds. They are white except for black primaries and secondaries and a short black tail. The head and neck are largely unfeathered and dark gray in color. The bill is black, thick at the base, and slightly decurved (USFWS 1992a).

Wood storks have been seen in South Carolina during every month of the year. However they are uncommon from December through mid-March (USFWS 1996). They typically nest in cypress/tupelo gum ponds with standing water. It is a highly colonial species usually nesting in large rookeries and feeding in flocks. The wood stork forages in a wide variety of shallow wetlands, wherever prey concentration reach high enough densities, in water that is shallow and open enough for the birds to be successful in their hunting efforts (Ogden et al. 1978, Browder 1984). Nesting wood storks generally use foraging sites that are located within 31 miles flight range of the colony (USFWS 1996).

There are no known wood stork rookeries present on/or near the site (SCDNR 2015). The onsite wetlands within the project boundaries could provide minimal suitable foraging habitat for this species, however foraging habitat is not the limiting factor for the wood stork. Therefore, it is our determination that the proposed project will not likely adversely affect the wood stork.

Shortnose sturgeon

The shortnose sturgeon was listed as endangered on March 11, 1967 (32 FR 4001). It is an anadromous fish that spawns in the coastal rivers along the east coast of North America from the St. John River in Canada to the St. Johns River in Florida. In South Carolina, the species is present in the Waccamaw, Pee Dee, Black (Winyah Bay system), Santee, Cooper, Ashepoo, Combahee, Edisto, and Savannah Rivers (NMFS 1998). The shortnose sturgeon prefers the nearshore marine, estuarine and riverine habitat of large river systems (NMFS/NOAA 2012). Adults have separate summer and winter areas.

There is no suitable habitat for the shortnose sturgeon on-site.

Atlantic sturgeon

The Carolina and the South Atlantic Distinct Population Segments (DPS) of the Atlantic sturgeon were listed as endangered in February 2012 (NOAA 2012). A DPS is a vertebrate population or group of populations that is discrete from other populations of the species and significant in

relation to the entire species. The ESA provides for listing species, subspecies, or distinct population segments of vertebrate species (NOAA 2012).

The Atlantic sturgeon is a long-lived, estuarine dependent, anadromous fish. Spawning adults migrate upriver in spring, beginning in February-March in the south. Adults spawn in freshwater of large rivers and migrate into estuarine and marine waters where they spend most of their lives. They spawn in moderately flowing water (46-76 cm/s) in deep parts of large rivers.

There is no suitable habitat for the Atlantic sturgeon on-site.

Canby's dropwort

Canby's dropwort was listed as endangered on February 25, 1991 (USFWS 1991). It is a perennial herb with erect, hollow stems, aromatic foliage and elongate, stoloniferous rhizomes. It has minute white flowers produced in terminal or axillary umbels; sepals may be tinged red. The fruit is a strongly-winged schizocarp. The species flowers from May through early August and fruits in early fall (USFWS 1991).

This species occurs in pond cypress savannas, shallows and edges of cypress/pond pine sloughs, and wet pine savannas. The healthiest populations seem to occur in open bays or ponds which are wet most of the year and have little or no canopy cover.

Based on review of aerial photography, review of the previous BA (Newkirk 2009), and on-site assessment of the isolated ponds it is our determination that there is no suitable habitat for this species. None of the ponds had the open characteristics this species requires. In addition, the closest known population is more than 15 miles north of the site.

Pondberry

Pondberry was listed as endangered on July 31, 1986 (USFWS 1986). Pondberry is a dioecious, deciduous shrub with pale yellow flowers. The fruit is a bright red drupe that matures in the fall. Flowering occurs late in February to mid-March; fruiting occurs from August to early October. The leaves have a strong, sassafras-like odor when crushed. Reproduction seems to be primarily vegetative by means of stolons (USFWS 1992a).

Pondberry is found in shallow depression ponds of the sandhills, along margins of cypress ponds in the pineland coastal areas of South Carolina, and in seasonally wet, low areas among bottomland hardwoods in interior areas.

Based on review of aerial photography, review of the previous BA (Newkirk 2009), and on-site assessment of the isolated ponds, it is our determination that the on-site ponds are not suitable habitat for this species due to the thick overstory, mid-story, and understory. The on-site surveys of the ponds were conducted during the flowering season of this species and no

individuals were observed. In addition, the closest known population is more than 20 miles east of the site on the FMNF.

American chaffseed

American chaffseed was listed as endangered on September 29, 1992 (USFWS 1992b). It is a perennial, erect herb in the figwort family with large, purplish-yellow tubular flowers. The fruit is a long and narrow capsule, enclosed in a loose-fitting sac-like structure that provides the basis for the common name, chaffseed (Musselman and Mann 1978 *in* USFWS 1992b). Flowering occurs from April to June (USFWS 1992a).

American chaffseed occurs in sandy acidic, seasonally moist to dry soils (USFWS 1992a). It typically occurs in fire-maintained ecosystems, such as the longleaf pine-wiregrass ecosystem of the southeastern coastal plain, open, moist pine flatwoods, and fire-maintained savannas. American chaffseed seems to require fire for persistence. One of the most serious threats to its continued existence is fire-suppression (USFWS 1992a).

Due to lack of fire management, there is no suitable habitat on-site for American chaffseed. In addition, the closest known population of chaffseed is more than 15 miles to the east in the FMNF.

Summary

Based on review of the literature, SCDNR database, aerial photography, review of the previous BA (Newkirk 2009), and on-site assessments it is our determination that the proposed project will (1) have no effect on the West Indian manatee, bald eagle, frosted flatwoods salamander, RCW, Atlantic sturgeon, short-nose sturgeon, Canby's dropwort, pondberry, and American chaffseed, and (2) may affect, but not likely to adversely affect the wood stork.

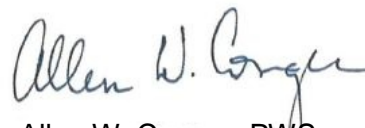
Closing

Should you have any questions or comments, please feel free to contact Brendon Kelly at 803-798-1200 or brendon.kelly@amec.com. We greatly appreciate your time and consideration.

Amec Foster Wheeler Environment and Infrastructure, Inc.



Brendon P. Kelly
Staff Environmental Scientist



Allen W. Conger, PWS
Principal Scientist

Attachments: References

Biological Assessment Addendum – Centerline Road Infrastructure Improvement Area

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March 30, 2015

Mr. Barry Jurs
Economic Development Director
Berkeley County
1003 Highway 52
Moncks Corner, SC 29461



**Subject: Protected Species Biological Assessment Addendum
Centerline Road Infrastructure Improvement Area
Berkeley County, South Carolina
Amec Foster Wheeler Project Number 6250140079**

Dear Mr. Jurs,

This document is an addendum to the Camp Hall Biological Assessment (BA) dated March 23, 2015. This BA analyzes the potential impacts of the Centerline Road Infrastructure Improvement Area on federally protected species.

The entire Improvement Area was surveyed on the ground on March 26, 2015 for potential habitat for the federally protected species in Berkeley County, South Carolina (Table 1 in March 23, 2015 BA). The general habitat types along the corridors are: loblolly pine (*Pinus taeda*) plantation (ranging from 5 – 35 year old planted pines); mixed pine-hardwood; a small area (~0.25 acre) of older (<30" diameter at breast height) loblolly pines, and isolated ponds. Habitat types are described in the March 23, 2015 BA except for the older loblolly pine stand that is described below.

The older loblolly pine stand at the corner of Centerline Road and US 176 consists of loblolly pine overstory, no midstory and a mowed understory. There is no evidence of burning. Due to the lack of burning, the area would not be considered suitable habitat for American chaffseed (*Schwalbea americana*). This area would be considered potential habitat for the red-cockaded woodpecker (*Picoides borealis*) (RCW). Each tree was examined for evidence of RCWs. No cavities were observed. The stand would not be considered as foraging habitat for the species because there are no mature pine stands within 300 feet.

The mixed-pine hardwood stands do not represent suitable habitat for protected species in Berkeley County.

The isolated ponds do not represent suitable habitat for the frosted flatwoods salamander (*Ambystoma cingulatum*) because (1) the ponds have a fairly closed canopy, and (2) the upland pine habitat has not been burned or allowed to mature and will not support the adults.

The isolated ponds do not represent suitable habitat for Canby's dropwort (*Oxypolis canbyi*) because the ponds do not have the open characteristics this species requires.

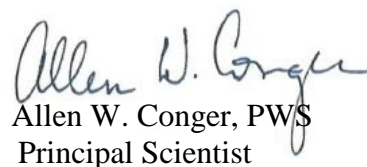
The isolated ponds do not represent suitable habitat for pondberry (*Lindera melissifolia*) due to the thick overstory, mid-story, and understory. The on-site surveys of the ponds were conducted during the flowering season of this species and no individuals were observed.

This information should be considered along with the March 23, 2015 BA. This information further supports our determination that the proposed project will (1) have no effect on the West Indian manatee, bald eagle, frosted flatwoods salamander, RCW, Atlantic sturgeon, short-nose sturgeon, Canby's dropwort, pondberry, and American chaffseed, and (2) may affect, but not likely to adversely affect the wood stork.

Amec Foster Wheeler Environment and Infrastructure, Inc.



Brendon P. Kelly
Staff Environmental Scientist



Allen W. Conger, PWS
Principal Scientist