



August 23, 2012

Reference: **Protected Species Assessment**
Marlboro Industrial Park Site – 315 acres
Bennettsville, South Carolina
S&ME Project No. 1614-12-283

S&ME, Inc. (S&ME) is pleased to submit our Protected Species Assessment for the above-referenced site located in Marlboro County, South Carolina. This work was performed in general accordance with S&ME Proposal No. 1614-8311-11, dated July 16, 2012, and the Master Services Agreement between Alliance Consulting Engineers and S&ME dated January 15, 2007.

1.0 PROJECT BACKGROUND

This Protected Species Assessment has been conducted to assess the potential for the presence of protected species on the site in preparation for proposed development. The project area is approximately 315 acres and is located northeast of the intersection of S.C. Highway 38 and Beauty Spot Road. This area is situated north of Bennettsville, Marlboro County, South Carolina as shown on Figures 1-3 in Appendix A.

2.0 SITE/HABITAT DESCRIPTIONS

The site is located in northern Marlboro County within the Atlantic Southern Loam Plains ecoregion of South Carolina. It is currently used as an industrial park and agricultural land. The properties adjacent to the site consist of agricultural fields, forested wetlands, and commercial/residential development.

Approximately one half of the site (150 acres) is developed as a light industrial park consisting of buildings, maintained lawns and roadways, paved parking areas, ornamental vegetation, and other man-made site alterations. The remainder of the site primarily consists of three habitat types: agricultural fields, pine-mixed hardwood uplands, and forested wetlands. Refer to the Aerial Map (Figure 3) and site photographs in Appendix A for the locations and depictions of the various habitats.

Agricultural Fields (Photographs 1-2)

Portions of the site were planted in row crops consisting of corn (*Zea mays*) and soybeans (*Glycine max*). These areas are routinely tilled, harvested, and otherwise manipulated.

Pine - Mixed Hardwood Upland (Photographs 3-5)

Some of the eastern portions of the site are considered pine – mixed hardwood habitat type. These areas have a dense canopy of water oak (*Quercus nigra*), willow oak (*Q. phellos*), loblolly pine (*Pinus taeda*), and sweet gum (*Liquidambar styraciflua*). A mid-story of hickory (*Carya* spp.), sassafras (*Sassafras albidum*), and persimmon (*Diospyros virginiana*) was observed and groundcover consists of oak seedlings and Virginia creeper (*Parthenocissus quinquefolia*).

Areas of this habitat type have been cut recently and dominant species include sweet gum, loblolly pine, black cherry (*Prunus serotina*) stump sprouts, and winged sumac (*Rhus copallina*). Other species observed in these areas include dog fennel (*Eupatorium capillifolium*), blackberry (*Rubus* spp.), goldenrod (*Solidago* spp.), and muscadine (*Vitis rotundifolia*).

Forested Wetlands (Photographs 6-8)

A forested wetland habitat type was observed in areas along the northeastern and southern boundaries. The vegetation in these areas consists of a sparse canopy of mature hardwood species and a dense mid-story of wetland shrubs. Standing water, flowing water, and a beaver impoundment were observed in this habitat type. Tree species observed in the forested wetland area include a canopy of willow oak, red maple (*Acer rubrum*), and tulip poplar (*Liriodendron tulipifera*), with a lower stratum of sweet gum, red bay (*Persea borbonia*), Chinese privet (*Ligustrum sinense*), sweetbay (*Magnolia virginiana*), fetterbush (*Lyonia lucida*), sweet gallberry (*Ilex coriacea*), giant cane (*Arundinaria gigantea*), and laurel-leaf greenbrier (*Smilax laurifolia*). The understory is sparse and dominated cinnamon fern (*Osmunda cinnamomea*), netted chainfern (*Woodwardia aereolata*), and southern lady fern (*Athyrium filix-femina*).

3.0 METHODOLOGY

S&ME personnel reviewed the South Carolina Department of Natural Resources (SCDNR) and the U.S. Fish and Wildlife Service (USFWS) websites in order to determine those species that are currently listed as federally protected (threatened or endangered) in Marlboro County. The results of this search, including identified protected species and preferred habitat, are presented in Table 1. Species lists are included in Appendix B.

Supporting information was researched for the purpose of identifying soil types, vegetative communities, and possible drainage features in the study area. The supporting information reviewed included aerial photography, topographic quadrangle maps, soil survey sheets, land use information, and data from the National Wetlands Inventory. The SCDNR Natural Heritage Program database was consulted regarding documented elements of occurrence for protected species in South Carolina. A search of this database revealed the presence of a bald eagle nest approximately 800 feet northeast of the site. This occurrence was documented in 2001 and was noted as “active” in 2003.

S&ME Biologist Amanda White performed a field review on August 1, 15, and 17, 2012. Based on this supporting information and other applicable mapping resources, portions of the study area that match the description of preferred protected species habitat were considered to be potential habitat for those protected species. These areas of potential habitat were subsequently field reviewed to confirm the presence/absence of the respective species.

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:

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
Shortnose Sturgeon <i>Acipenser brevirostrum</i>	E	Brackish water of large rivers and estuaries; Spawns in freshwater areas.	No
Atlantic Sturgeon <i>Acipenser oxyrinchus</i>	E	Shallow coastal waters and estuaries; Spawns in freshwater areas.	No
Canby's Dropwort <i>Oxypolis canbyi</i>	E	Wet pineland ponds, savannas, wet meadows, & around edges of open cypress ponds; prefers habitat with little or no canopy closure. Flowers mid-August through October	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 10-12 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). Please note that the bald eagle was removed from the federally threatened list in 2007, but still has protection under Bald and Golden Eagle Protection Act.

Based on the proximity to Crooked Creek, Lake Wallace, and the nearby known element of occurrence of this species, the forested wetlands are considered suitable nesting habitat for bald eagle. Upon identification of potential habitat, S&ME examined the mature trees in the forested wetlands portions of the site. No active or abandoned bald eagle nest sites were observed during the pedestrian field review. Development is not planned for the forested wetlands on northeastern portion of the site. Accordingly, future development of the site 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. 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 site does not contain suitable nesting or feeding habitat for the red-cockaded woodpecker. There are no relatively open pine stands of proper age for nest cavities. Accordingly, future development of the site is not expected to impact this species.

Shortnose Sturgeon – Federally Listed Endangered

BIOLOGICAL OPINION: NO EFFECT

The shortnose sturgeon is a bony, anadromous fish growing to a length of up to four feet. Shortnose sturgeon exhibit five rows of plates along the body, with olive to black coloring along the back, and yellow to white coloring on the belly. Four barbels are located in front of the mouth are used to locate food along the river bottom. The shortnose sturgeon migrates from salt water to freshwater to spawn from April to May. The shortnose sturgeon's habitat consists of tidal river systems along the Atlantic coast of North America. This species typically occupies the channels and deeper holes within the river, while feeding in shallow areas at night.

The site does not contain suitable habitat for the shortnose sturgeon. No large river systems are located within the site. The onsite wetlands and streams are not of adequate size to be considered

potential habitat. Accordingly, future development of the site is not expected to impact this species.

Atlantic Sturgeon – Federally Listed Endangered

BIOLOGICAL OPINION: NO EFFECT

The Atlantic sturgeon is a cartilaginous, anadromous fish growing to a length of up to fourteen feet. Individuals are blueish-black or olive brown with a white belly and have five rows of plates along the body. Four barbels are located in front of the mouth are used to locate food along the bottom. The Atlantic sturgeon can be differentiated from the shortnose sturgeon by its larger size, smaller mouth, narrower snout, and their plates. This species migrates from salt water to freshwater to spawn from February to March. The Atlantic sturgeon's habitat consists of nearshore coastal waters along the Atlantic coast of North America.

The site does not contain suitable habitat for the shortnose sturgeon. No large river systems are located within the site. The onsite wetlands and streams are not of adequate size to be considered potential habitat. Accordingly, future development of the site is not expected to impact this species.

Canby's Dropwort – Federally Listed Endangered

BIOLOGICAL OPINION: NO EFFECT

Canby's dropwort is a perennial herb growing from elongate, stoloniferous rhizomes to a height of 2.5 to 4 feet in height. The stems are hollow and erect with slender leaves. The species is aromatic, smelling like dill. The flowering period is from mid-August through October. The flowers of Canby's dropwort have white petals and pale green sepals and are five-parted. The leaves are round in cross-section, thin, and divided by partitions. The primary habitats of Canby's dropwort are wet pineland ponds and savannas, wet meadows, and around the edges of open cypress ponds. The species prefers habitat with little or no canopy closure. Canby's dropwort prefers soils with a high water table.

The site contains marginally suitable habitat for Canby's dropwort. Although, there are no true wet pineland ponds, savannas, wet meadows, or cypress ponds within the site, a small portion of the wetland habitat extends into the power line easement. Upon identification of potential habitat, S&ME examined the open-canopy portion of the wetlands on the northeastern part of the site. The pedestrian field review was conducted during the flowing period for Canby's dropwort and no individuals were identified. Development is not planned for the forested wetlands on northeastern portion of the site. Accordingly, future development of the site 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 11 years experience in environmental consulting. Mr. Daves is proficient in conducting wetland delineations, environmental permitting activities, and habitat assessments, including protected species surveys. 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.

6.0 REFERENCES CITED

Cummings, Candace J. and G.K. Yarrow. 1996. A Guide to South Carolina's Endangered and Threatened Species – EC 693. Clemson Extension Service.

South Carolina Department of Natural Resources. 2012. Rare, Threatened, and Endangered Species Inventory. Current On-Line Edition - <http://www.dnr.sc.gov/species/pdf/marlboro.pdf>.

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>.

U.S. Fish and Wildlife Service. 2012 South Carolina List of Endangered, Threatened and Candidate Species - http://www.fws.gov/charleston/pdf/etcountylist_05_12_final.pdf.

U.S. Department of Agriculture – National Resources Conservation Service Web Soil Survey. 2012. <http://websoilsurvey.nrcs.usda.gov/app/>.

7.0 SUMMARY AND CONCLUSIONS

Based on the literature review, habitat assessment, and pedestrian field review of the project area, it is our opinion that the project area does not provide suitable habitat for the listed protected species with documented populations in Marlboro County, except for bald eagle and Canby's dropwort. Development is not planned in the forested wetlands and power line easement on the northeastern portion of the site. Therefore, proposed development of the site west of the power line easement will have "no effect" on the listed protected species.

No further action is recommended at this time. This Protected Species Assessment will be forwarded to the USFWS for review and comment. The USFWS comments will be provided to you as soon as S&ME receives them.

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

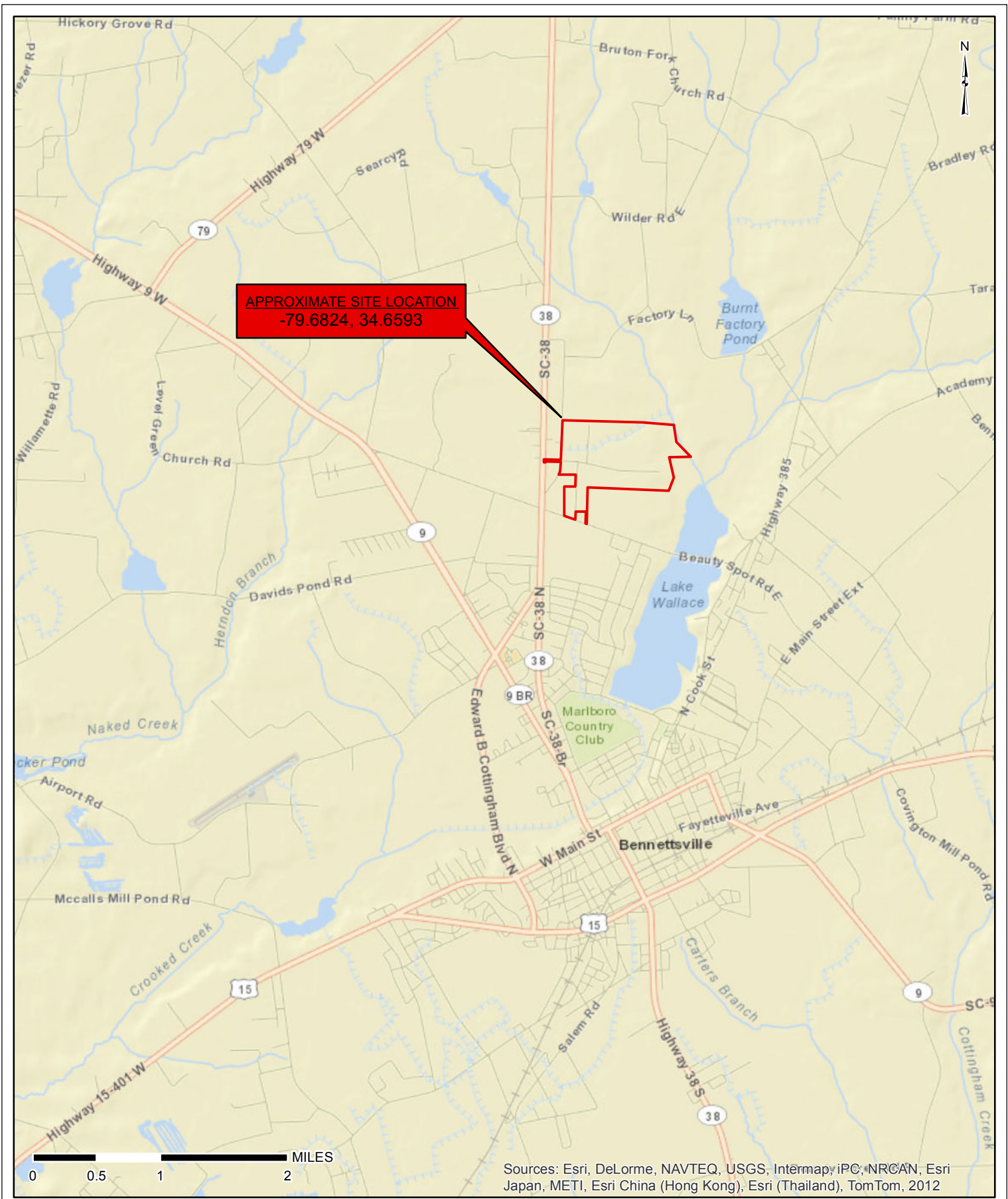
Senior Reviewed by Tom Behnke, P.G. – Environmental Department Manager

Appendix A – Figures, Site Photographs

Appendix B – County Species Lists from USFWS and SCDNR

APPENDIX A

Figures
Site Photographs



SCALE:	1 IN = 1 MI
CHECKED BY:	WCD
DRAWN BY:	ADW
DATE:	8/24/2012

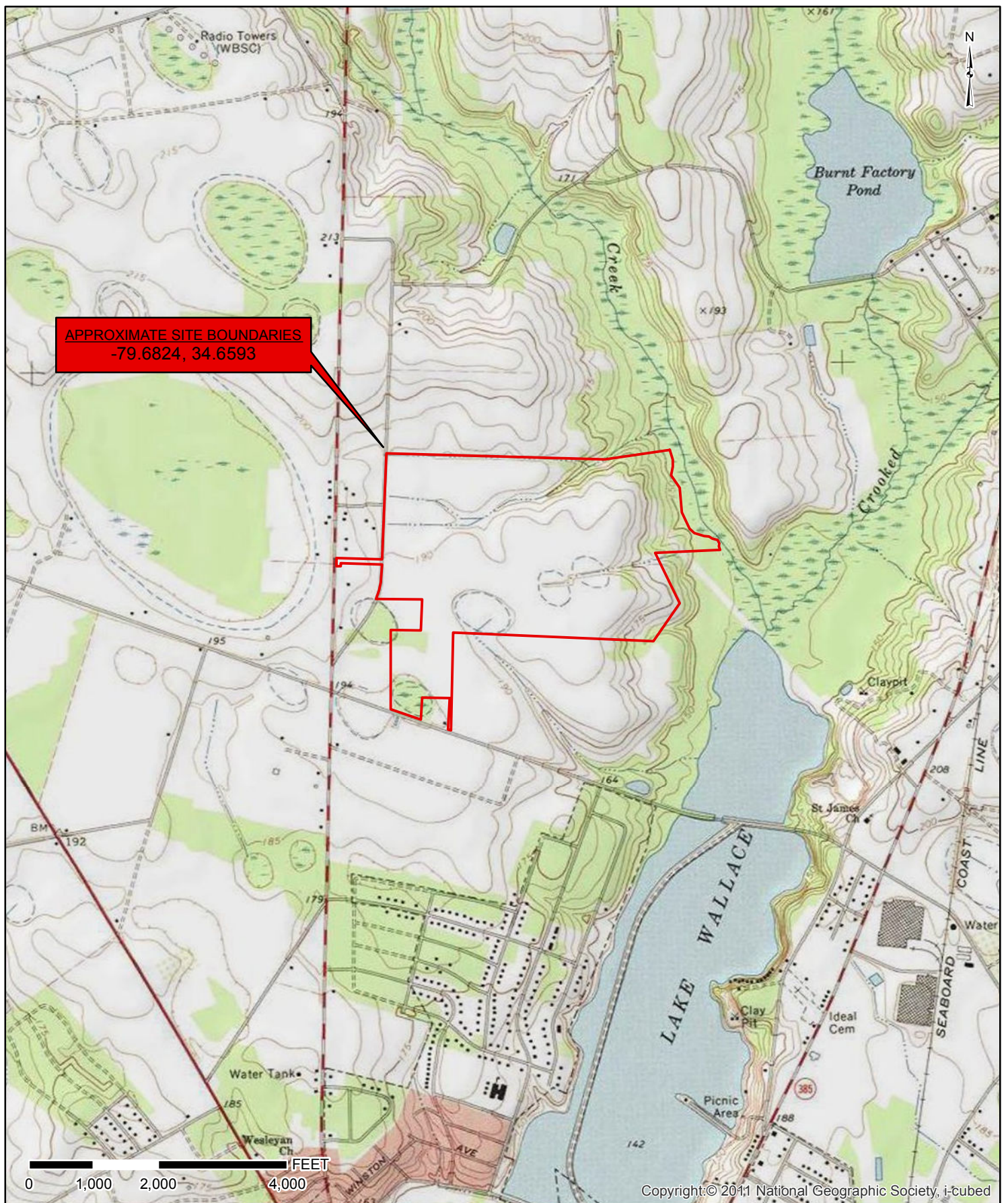


VICINITY MAP
MARLBORO INDUSTRIAL PARK - 315 ACRES
BENNETTVILLE, MARLBORO COUNTY, SOUTH CAROLINA

FIGURE NO.
1

PROJECT NO: 1614-12-283

SOURCE: ESRI RESOURCE CENTER - STREETMAP BASEMAP



APPROXIMATE SITE BOUNDARIES
-79.6824, 34.6593

SCALE:	1 IN = 2,000 FT
CHECKED BY:	WCD
DRAWN BY:	ADW
DATE:	8/21/2012

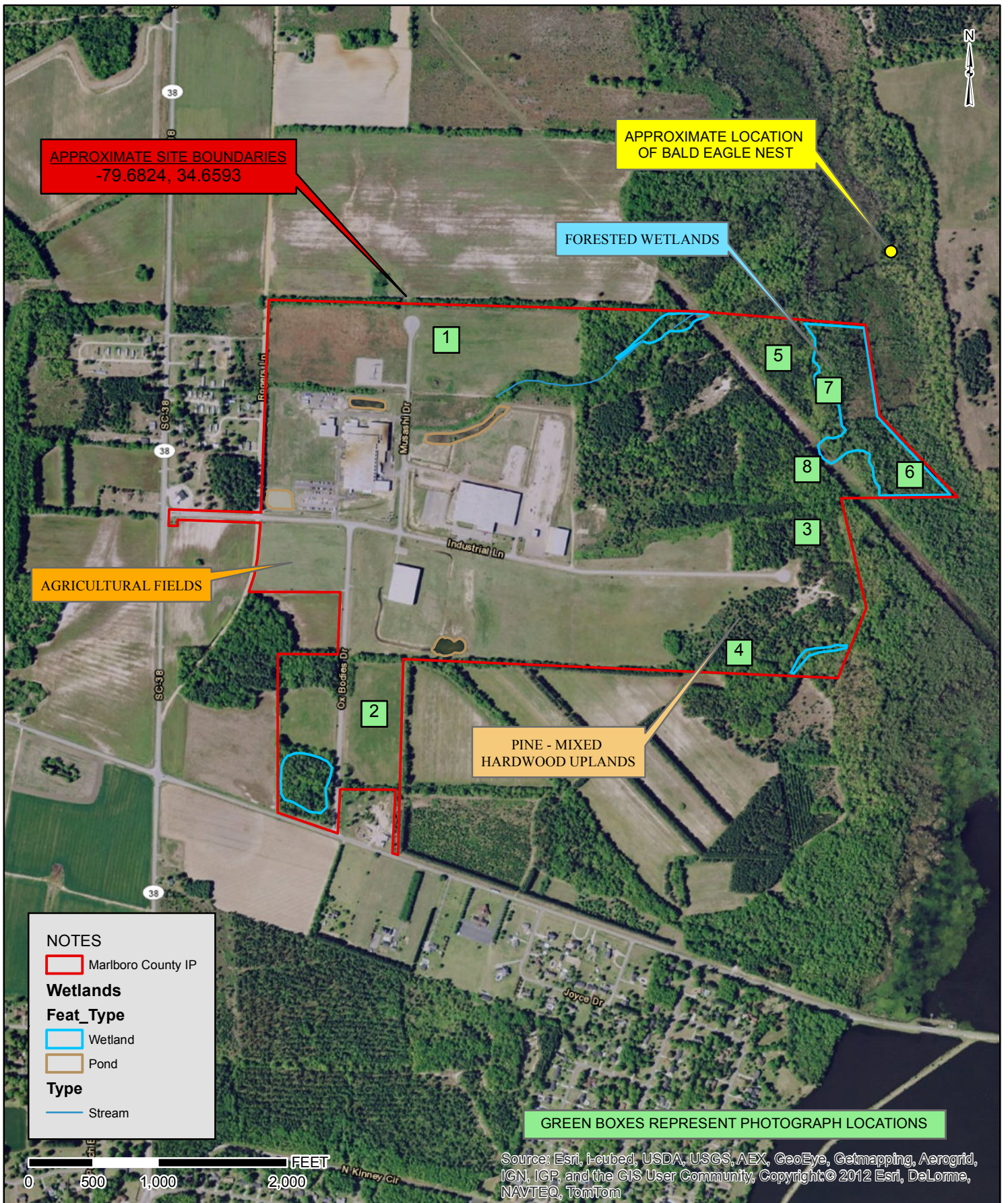


PROJECT NO: 1614-12-283

TOPOGRAPHIC MAP
MARLBORO INDUSTRIAL PARK - 315 ACRES
 BENNETTSVILLE, MARLBORO COUNTY, SOUTH CAROLINA

SOURCE: USGS TOPOGRAPHIC MAP - BENNETTSVILLE NORTH, SC - 1972

FIGURE NO.
2



APPROXIMATE SITE BOUNDARIES
-79.6824, 34.6593

APPROXIMATE LOCATION
OF BALD EAGLE NEST

FORESTED WETLANDS

AGRICULTURAL FIELDS

PINE - MIXED
HARDWOOD UPLANDS

GREEN BOXES REPRESENT PHOTOGRAPH LOCATIONS

NOTES

Marlboro County IP

Wetlands

Feat_Type

Wetland

Pond

Type

Stream

0 500 1,000 2,000 FEET

Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community, Copyright © 2012 Esri, DeLorme, NAVTEQ, TomTom

SCALE:	1 IN = 1,000 FT
CHECKED BY:	WCD
DRAWN BY:	ADW
DATE:	8/23/2012



PROJECT NO: 1614-12-283

AERIAL MAP
MARLBORO INDUSTRIAL PARK - 315 ACRES
BENNETTSVILLE, MARLBORO COUNTY, SOUTH CAROLINA

SOURCE: ESRI RESOURCE CENTER - IMAGERY BASEMAP - 2009

FIGURE NO.
3



1 Corn fields were observed on the southern portion of the site.



2 Soybean fields were observed on the northern portion of the site



3 Pine – mixed hardwood uplands were observed on the eastern portion of the site.



4 Pine – mixed hardwood uplands were observed on the southern portion of the site.



5 Portions of the upland habitat have recently been cut-over on the eastern portion of the site.



6 Forested wetlands were observed along the eastern boundary of the site.



7 Forested wetlands along the eastern boundary of the site.



8 A small portion of the wetland habitat is situated in the easement on the eastern part of the site..

APPENDIX B

**County Species Lists from
USFWS and SCDNR**

Rare, Threatened, and Endangered Species and Communities Known to Occur in Marlboro County, South Carolina

March 13, 2012

Scientific Name	Common Name	USES Designation	State Protection	Global Rank	State Rank
<u>Vertebrate Animals</u>					
<i>Haliaeetus leucocephalus</i>	Bald Eagle		ST: Threatened	G5	S2
<i>Hyla andersonii</i>	Pine Barrens Treefrog		ST: Threatened	G4	S2S3
<i>Picoides borealis</i>	Red-cockaded Woodpecker	LE: Endangered	SE: Endangered	G3	S2
<i>Rana palustris</i>	Pickerel Frog			G5	SNR
<i>Semotilus lumbee</i>	Sandhills Chub			G3	S2
<u>Invertebrate Animals</u>					
<i>Elliptio congaraea</i>	Carolina Slabshell			G3	S3
<i>Lampsilis cariosa</i>	Yellow Lampmussel			G3G4	S2
<u>Animal Assemblage</u>					
Waterbird Colony				GNR	SNR
<u>Vascular Plants</u>					
<i>Carex canescens</i> ssp. <i>disjuncta</i>	Silvery Sedge			G5T4?	SNR
<i>Eurybia spectabilis</i>	Showy Aster			G5	SNR
<i>Lycopus cokeri</i>	Carolina Bugleweed			G3	S2
<i>Nestronia umbellula</i>	Nestronia			G4	S3
<i>Rhexia aristosa</i>	Awed Meadowbeauty			G3	S3
<i>Solidago verna</i>	Spring-flowering Goldenrod			G3	S2
<i>Stylisma pickeringii</i> var. <i>pickeringii</i>	Pickering's Morning-glory			G4T3	S2
<i>Utricularia olivacea</i>	Piedmont Bladderwort			G4	S2

**South Carolina List of Endangered, Threatened and Candidate Species
April 2012**

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 as deemed necessary and may differ from earlier lists. **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	Atlantic Sturgeon*	<i>Acipenser oxyrinchus*</i>	E
	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Harperella	<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	Atlantic Sturgeon*	<i>Acipenser oxyrinchus*</i>	E
	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

<u>COUNTY</u>	<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS</u>
Kershaw (continued)	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	Atlantic Sturgeon*	<i>Acipenser oxyrinchus*</i>	E
	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 georgianus</i>	C
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
Lee	American chaffseed	<i>Schwalbea americana</i>	E
	Atlantic Sturgeon*	<i>Acipenser oxyrinchus*</i>	E
	Canby's dropwort	<i>Oxypolis canbyi</i>	E
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
Lexington	Atlantic Sturgeon*	<i>Acipenser oxyrinchus*</i>	E
	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
	Shortnose sturgeon*	<i>Acipenser brevirostrum*</i>	E
	Smooth coneflower	<i>Echinacea laevigata</i>	E
Marion	Atlantic Sturgeon*	<i>Acipenser oxyrinchus*</i>	E
	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Pondberry	<i>Lindera melissifolia</i>	E
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
	Shortnose sturgeon*	<i>Acipenser brevirostrum*</i>	E
Marlboro	Atlantic Sturgeon*	<i>Acipenser oxyrinchus*</i>	E
	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