

**Attachment A**

*Biological Assessment for Endangered, Threatened, and Noteworthy Species, Wetlands,  
and Significant Natural Areas  
in Association With Catawba Nuclear Station and Related Power Transmission Lines,*

L.L. Gaddy. March 2001

---

BIOLOGICAL ASSESSMENT FOR  
ENDANGERED, THREATENED, AND NOTEWORTHY SPECIES,  
WETLANDS, AND SIGNIFICANT NATURAL AREAS  
IN ASSOCIATION WITH THE  
CATAWBA NUCLEAR STATION  
AND RELATED POWER TRANSMISSION LINES

prepared for

Duke Power Company

Charlotte, North Carolina

by

L. L. Gaddy, Ph. D.

*terra incognita*

2333 Terrace Way

Columbia, South Carolina 29205

March 2001

### Project Description

The action proposed by Duke Energy Corporation is the continued operation of the Catawba Nuclear Station in York County, South Carolina under a renewed license of the Nuclear Regulatory Commission. In addition, 42.4 miles (68.3 km) of transmission lines associated with the Catawba Nuclear Station in the original environmental impact analysis (U. S. Nuclear Regulatory Commission, 1973) will continue to be operated and maintained. No new construction will be carried out as part of this action.

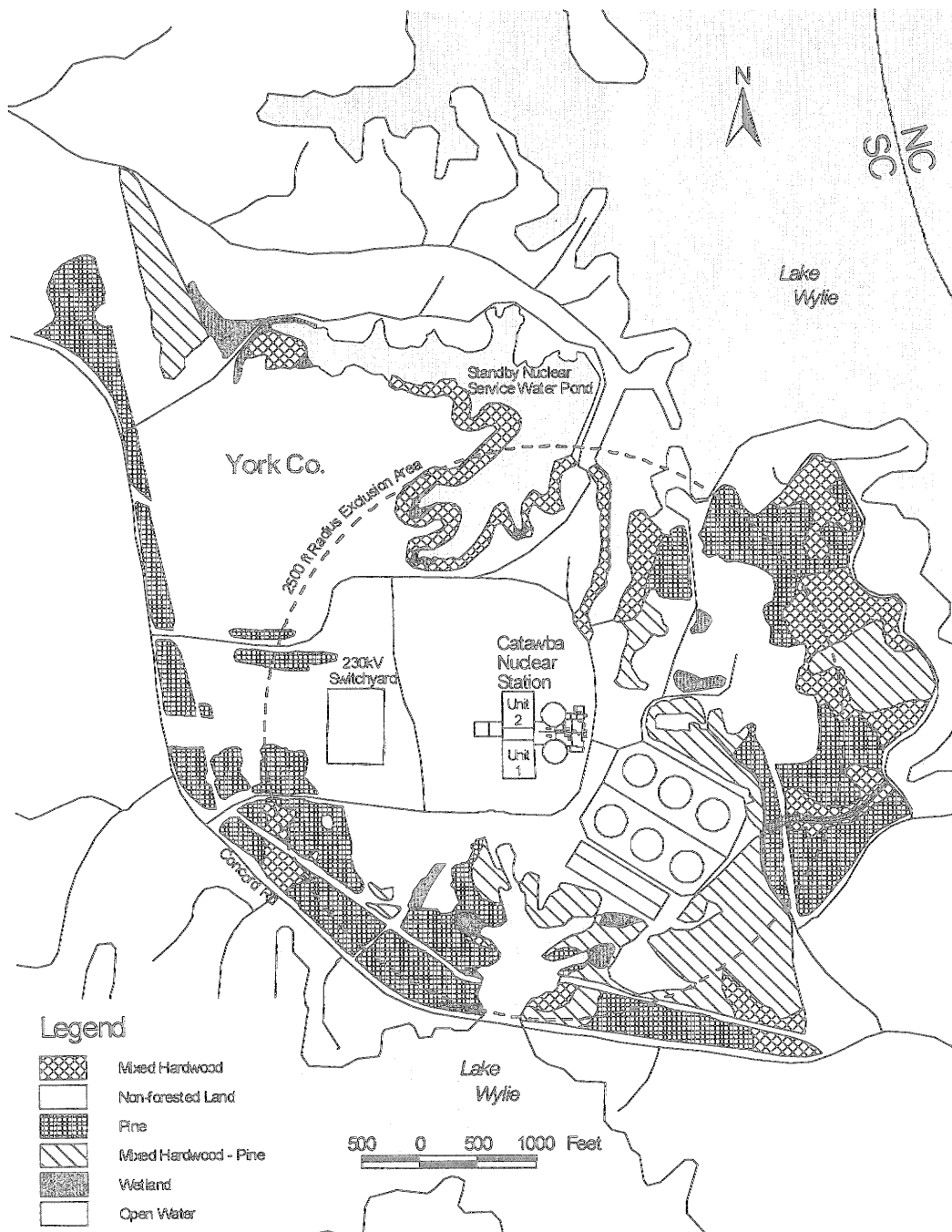
### Project Area

Catawba Nuclear Station is located approximately nine miles (14.4 km) north northwest of Rock Hill, South Carolina. The station is on the western shore of Lake Wylie, just over one mile west of the North Carolina-South Carolina state line. The Catawba site is found in the Piedmont physiographic province of South Carolina. The study area harbors typical Piedmont plant communities such as pine, pine-mixed hardwoods, mixed hardwoods, and bottomland mixed hardwoods. The soils of at the Catawba site and those in related power transmission line rights-of-way are relatively diverse. In eastern York County, there are belts of the poorly-drained, basic to circumneutral Iredell soils; in central York County, typical Piedmont sandy and clay loams such as Cecil and Lloyd are prevalent; and in western York County and eastern Cherokee County, the sandy, rocky soils of the Kings Mountain belt prevail.

The Exclusion Area, delineated on Figure 1, is the study area for the Catawba relicensing project. It is a circle with a 2500-foot (757.6 m) radius from a center point located between the two reactor buildings and encompasses 450.5 acres (182.4 ha). The relicensing project area also includes approximately 42.4 miles (68.3 km) of transmission rights-of-way radiating northward, southward, and westward from Catawba Nuclear Station (Figure 2).

Table 1 presents a comparison of the plant community coverage of the Exclusion Area in 1974 (from Duke Power Company, 1975) and in 2000 (from Figure 1). Sixty-nine percent of the Exclusion Area is now nonforested land, while only five percent of the site was nonforested before construction began. The total pine acreage of the study area has dropped from 69% to 25%, the pine-mixed hardwood area from 16% to 9% of the Exclusion Area, and the mixed hardwood acreage from 22% to 2%. Currently, approximately 36% of the Exclusion Area is forested.

Catawba Nuclear Station  
Site Land Cover  
Figure 1



Catawba Nuclear Station  
Transmission Lines  
Figure 2

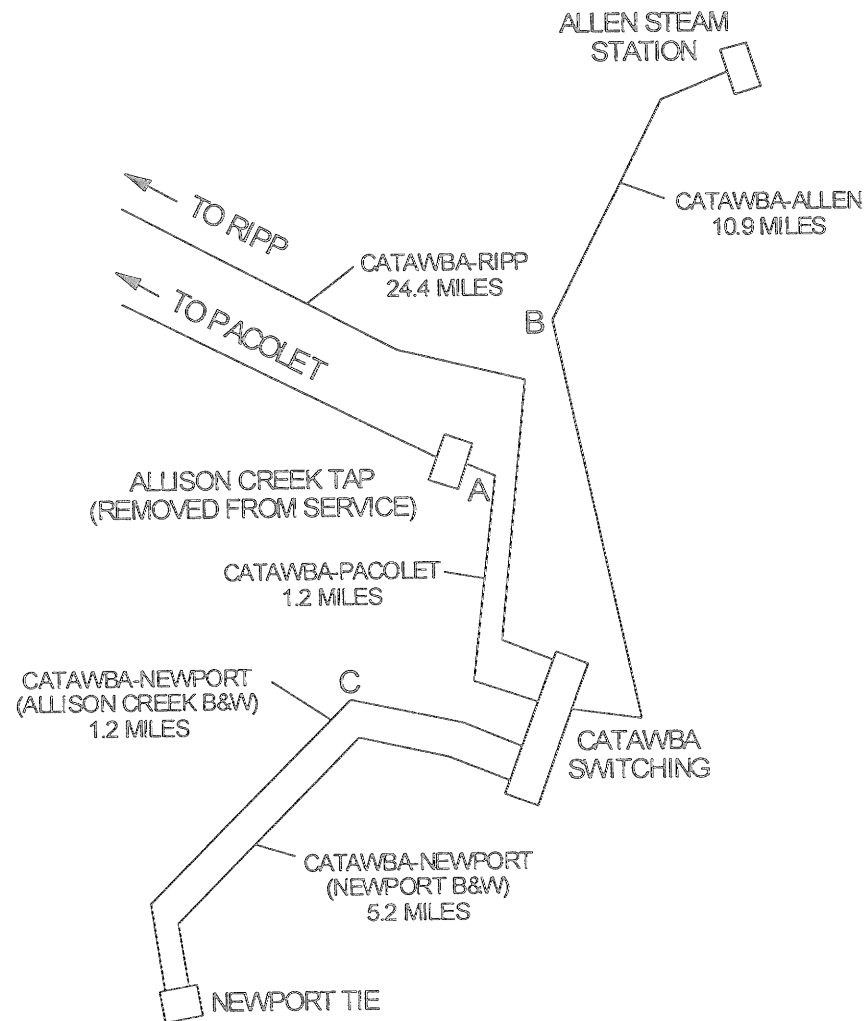


Table 1. Plant community percentage cover at the site of the  
Catawba Nuclear Station: 1974 and 2000.<sup>1</sup>

PLANT COMMUNITY/COVER TYPE	1974	2000
NON-FORESTED AREAS (Clearings, Parking Lots, Transmission Corridors, etc.)	4	67
PINE	60	23
PINE-MIXED HARDWOOD	15	8
MIXED HARDWOOD	21	1
WETLAND	0	<1

<sup>1</sup> Data used in this table was taken from ER Table 2.2.1-1 in the Catawba Nuclear Station Environmental Report, Volume 2 (Duke Power Company, 1975) and from Figure 1 herein.

## Methodology

Fieldwork for this project began in June 2000 and continued into the autumn of 2000. All communities and cover types within the Exclusion Area were thoroughly inventoried, with the exception of the industrial areas in the immediate center of the site near the station. Black and white and natural color aerial photographs were used, supplemented by extensive fieldwork, to compile Figure 1—The 2000 vegetation map of the Catawba site.

Table 2, a list of all endangered, threatened, and noteworthy species, habitats, and special areas from York and Cherokee counties, South Carolina, was compiled prior to the initiation of the fieldwork. This list was consulted during the floristic and faunistic fieldwork, which lasted from late June through December. A checklist of the vascular plants of the Exclusion Area and the power transmission rights-of-way was compiled from field notes and serves as the Appendix for this report. Areas that appeared to be reasonable habitat for federally- and state-listed species were intensively inventoried in the summer and in early autumn.

The power transmission rights-of-way associated with the project were also inventoried in summer and early fall. Intensive surveys of the rights-of-way were conducted where reasonable habitat for listed species in Table 2 existed or where a known population of a listed species occurred within 0.5 mile (0.8 km) of the project's transmission lines.

### Description of Plant Communities and Habitats Present within the Project Area

According to Figure 2.2.1-1 accompanying the original survey of the vegetation communities of the Catawba Site (Duke Power, 1975), six major plant community/cover types were present before construction began. They were: 1) clearings; 2) fields or pastures; 3) early successional shortleaf pine-Virginia pine; 4) loblolly pine; 5) mixed pine-hardwoods; and 6) hardwoods.

Figure 1 is a new plant community/cover type map of the Catawba Exclusion Area compiled from color and false color infrared aerial photography and from fieldwork conducted in the summer and fall of 2000. Six cover types, including five major plant community types, are included in Figure 1. The plant community types are: 1) non-forested land (includes "clearings" and "fields or pastures" from the 1974 map); 2) pine (includes "early successional shortleaf pine-Virginia pine" and "loblolly pine" from the 1974 map); 3) pine-mixed hardwood (equals "mixed pine-hardwood" on the 1974 map); 4) mixed hardwood ("hardwoods" on the 1974 map); and 5) wetland (not included in the 1974 map). The final cover type included in the 2000 map is open water, which was not considered a category on the 1974 map. Table 1 gives the changes in percentage cover of the plant community types from 1974 to 2000.

Table 2. Endangered, threatened, and noteworthy species and habitats known from York and Cherokee counties, South Carolina.

SCIENTIFIC NAME	COMMON NAME	GROUP	GLOBAL	STATE RANK	LEGAL STATUS
ACRIS CREPITANS CREPITANS	NORTHERN CRICKET FROG	AMPHIB	G5T5	S5	SC
AGALINIS AURICULATA	EARLEAF FOXGLOVE	PLANT	G3	S1	SC
AGRIMONIA PUBESCENS	SOFT GROOVEBUR	"	G5	S1	SC
ALLIUM CERNUUM (C)	NODDING ONION	"	G5	S?	SC
AMPHIANTHUS PUSILLUS	POOL SPRITE	"	G2	S1	FT/ST
ASTER GEORGIANUS (B)	GEORGIA ASTER	"	G2G3	S?	F/Candidate
ASTER LAEVIS	SMOOTH BLUE ASTER	"	G5	S?	SC
CAMASSIA SCILLOIDES	WILD HYACINTH	"	G4G5	S2	RC
CAREX SCABRATA (C)	ROUGH SEDGE	"	G5	S?	SC
CYPERUS GRANITOPHILUS	GRANITE-LOVING FLATSEDEGE	"	G3Q	S?	SC
DASISTOMA MACROPHYLLA	MULLEIN FOXGLOVE	"	G4	S?	SC
ELEOCHARIS PALUSTRIS	SPIKE-RUSH	"	G5	S?	SC
ELIMIA CATENARIA	GRAVEL ELIMIA	MOLLUSK	G?	S?	SC
ELYMUS RIPARIUS	WILD-RYE	PLANT	G5	S?	SC
ETHEOSTOMA COLLIS	CAROLINA DARTER	FISH	G3	S?	SC
EUPATORIUM SESSILIFOLIUM VAR VASEYI	THOROUGHWORT	PLANT	G5T?	S?	SC
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	BIRD	G4	S2	FT/SE
HELIANTHUS LAEVIGATUS (B)	SMOOTH SUNFLOWER	PLANT	G4	S?	SC
HELIANTHUS SCHWEINITZII	SCHWEINITZ'S SUNFLOWER	"	G2	S1	FE/SE
HEXASTYLIS NANIFLORA (C)	DWF-FLWERED HEARTLEAF	"	G2	S2	FT/ST
HYDRANGEA CINEREA (C)	ASHY HYDRANGEA	"	G4	S?	SC
HYMENOCALLIS CORONARIA	SHOALS SPIDER-LILY	"	G2Q	S2	NC
ISOETES PIEDMONTANA	PIEDMONT QUILLWORT	"	G3	S2	SC
JUNCUS GEORGIANUS	GEORGIA RUSH	"	G4	S?	SC
LILIUM CANADENSE	CANADA LILY	"	G5	S1?	SC
LIPOCARPHA MICRANTHA	DWARF BULRUSH	"	G4	S2	SC
MELANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER	"	G5	S?	SC
MENISPERMUM CANADENSE (B)	CANADA MOONSEED	"	G5	S?	SC
MINUARTIA UNIFLORA	ONE-FLOWER STITCHWORT	"	G4	S?	SC
MONADNOCK (B)		HABITAT	G?	S?	SC
MYOTIS AUSTRORIPARIUS (C)	SOUTHEASTERN MYOTIS	MAMMAL	G3G4	S2S3	ST
NAJAS FLEXILIS	SLENDER NAIAD	PLANT	G5	S?	SC
OUTCROP		HABITAT	G?	S?	SC
PANAX QUINQUEFOLIUS	AMERICAN GINSENG	PLANT	G4	S2S3	RC
POA ALSODES	BLUE-GRASS	"	G4G5	S?	SC
QUERCUS BICOLOR	SWAMP WHITE OAK	"	G5	S1	SC
QUERCUS OGLETHORPENSIS	OGLETHORPE'S OAK	"	G3	S3	SC
RANA PALUSTRIS	PICKEREL FROG	AMPHIB	G5	S?	SC
RANUNCULUS FASCICULARIS	EARLY BUTTERCUP	PLANT	G5	S?	SC
RATIBIDA PINNATA	GRAY-HEAD PRAIRIE CONEFLOWER	"	G5	S?	SC
RUDBECKIA HELIOPSISIDIS	SUN-FACING CONEFLOWER	"	G2	S1	NC
SCUTELLARIA PARVULA	SMALL SKULLCAP	"	G4	S?	SC



<u>SCUTELLARIA SERRATA*</u>	SERRATE-LEAVED SKULLCAP	"		S1	?
SILPHIUM TEREBINTHINACEUM	PRAIRIE ROSINWEED	"	G4G5	S1	SC
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	"	G5	S?	SC
SOLIDAGO RIGIDA	PRAIRIE GOLDENROD	"	G5	S1	SC
THERMOPSIS MOLLIS	SOFT-HAIRED THERMOPSIS	"	G4?	S?	SC
TIARELLA CORDIFOLIA VAR CORDIFOLIA	HEART-LEAVED FOAM FLOWER	"	G5T5	S?	SC
TORREYOCHLOA PALLIDA	PALE MANNA GRASS	"	G5?	S?	SC
VERBENA SIMPLEX	NARROW-LEAVED VERVAIN	"	G5	S?	SC
VERONICASTRUM VIRGINICUM	CULVER'S-ROOT	"	G5	S?	SC
XEROPHYLLUM ASPHODELOIDES (C)	TURKEY-BEARD	"	G4	S1	SC

Species in bold are federally-listed or candidates for listing. Underlined species are found within 0.5 mile of the site or one of the associated rights-of-way.

Rank: G=global; S=state. 1=0-5 populations or critically imperiled; 2=6-20 populations or imperiled; 3=21-100 populations or rare or uncommon; 4=greater than 100 populations known or apparently secure; 5=secure globally, though may be locally rare.

Status: F=federal; S=state. E=endangered; T=threatened; NC=national concern; RC=regional concern; SC=state concern.

\*First published record from South Carolina; currently this species is not listed in South Carolina, but is listed on the North Carolina "watch" list in Amoroso (1999).

Data in Table 2 taken from South Carolina Department of Natural Resources web site; last updated June, 2000.

(B)-FOUND IN BOTH COUNTIES; (C)-FOUND ONLY IN CHEROKEE COUNTY; ALL OTHER SPECIES ONLY FOUND IN YORK COUNTY.

The five cover types mapped on Figure 1 are discussed below:

1. **Non-forested Land.** This cover type includes industrial areas, parking lots, lawns, and ornamental planting areas (e.g., trees in parking lot medians). Native species are generally absent from these areas. Some weedy disturbed areas have a flora similar to that of transmission line rights-of-way (see Transmission Rights-of-Way Related to the Catawba Relicensing Project below). Many parking lot banks and roadbanks are planted with sericea lespedeza (*Lespedeza cuneata*).
2. **Pine.** Most of the pine communities of the Catawba Site Exclusion Area are young, planted loblolly pine (*Pinus taeda*) communities. These communities range between 20 and 50 years old and are scattered throughout the project area (Figure 1). Virginia pine (*Pinus virginiana*) and, rarely, shortleaf pine (*Pinus echinata*) are widely scattered in the pine communities. The understory and herbaceous layer of this type has very few species.
3. **Pine-Mixed Hardwood.** The pine-mixed hardwood stands at Catawba are the product of natural succession from pine woods to hardwoods. This type is highly variable and includes xeric (dry) and mesic (moist) stands. Most of the pine-mixed hardwood stands, however, are dry-site communities found on upper slopes or ridges. In these stands, xeric species such shortleaf pine, Virginia pine, white oak (*Quercus alba*), southern red oak (*Quercus falcata*), post oak (*Quercus stellata*), black oak (*Quercus velutina*), mockernut hickory (*Carya tomentosa*) dominate the canopy. In areas with more moisture such as bluffs and ravines, this type is often found mixed with the mixed hardwood type, especially where clearing has taken place in the past. Here, tulip poplar (*Liriodendron tulipifera*), red oak (*Quercus rubra*), white ash (*Fraxinus americana*), are mixed in the canopy with scattered shortleaf pines. The understory species in the pine-mixed hardwood type are sourwood (*Oxydendrum arboreum*), sparkleberry (*Vaccinium arboreum*), chalk maple (*Acer leucoderme*) (see Natural Areas below), and dogwood (*Cornus florida*). The herbaceous layer in this plant community is often open with scattered spotted wintergreen (*Chimaphila maculata*), woodland oat grass (*Stipa avenacea*), and other dry-site herbs and graminoids.

4. **Mixed Hardwood.** The mixed hardwood type is found in coves, ravines, on bluffs, and on moist slopes. Here, pines are generally absent or rare in the canopy and deciduous tree species are the dominant species. In mesic coves and ravines, white oak, red oak, white ash (*Fraxinus americana*), tulip poplar, (*Liquidambar styraciflua*), American beech (*Fagus grandifolia*), and pignut hickory (*Carya glabra*) are the most commonly-seen species. On the other hand, on drier slopes and xeric ridgetops, post oak, black oak, southern red oak, and scattered shortleaf pine prevail in the canopy. Dogwood (*Cornus florida*), redbud (*Cercis canadensis*), sourwood, beech, red maple (*Acer rubrum*), eastern red cedar (in dry communities), and elms (*Ulmus rubra* and *Ulmus alata*) are found in the understory of the mixed hardwood type. Bloodroot (*Sanguinaria canadensis*), Virginia snakeroot (*Aristolochia serpentaria*), sedges (*Carex* spp.), and common heartleaf (*Hexastylis arifolia*) were among the most common species of the herbaceous layer of this cover type.
5. **Wetland.** The “wetland” cover type is a catch-all type that includes numerous small wetland plant communities scattered around the Catawba Site. Among the wetland areas mapped on Figure 1 are small bottomlands, beaver ponds, disturbed seepages, creekbanks, lake margins, and artificial impoundments. Black willow (*Salix nigra*), tag alder (*Alnus serrulata*), river birch (*Betula nigra*), buttonbush (*Cephalanthus occidentalis*), sycamore (*Platanus occidentalis*), and sweet gum (*Liquidambar styraciflua*) are the woody dominants in these wetland types. In disturbed, open areas such as beaver ponds and disturbed seepages and creekbanks, black willow and tag alder dominate. Along lake margins, buttonbush, black willow, swamp tupelo (*Nyssa biflora*) (rarely), and nonwoody species such as seedboxes (*Ludwigia* spp.), cutgrasses (*Leersia* spp.), and sedges (*Carex* spp.) are abundant. Cattail (*Typha latifolia*) and woolgrass bulrush (*Scirpus cyperinus*) are present in openings in one impoundment with black willow and other wetland species. Two wet ravine bottoms in the southern portion of the project area along Lake Wylie harbor stands of bottomland hardwood species such as sweet gum, river birch, black willow, green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), sycamore, and cottonwood (*Populus deltoides*). The understories here are dominated by false nettle (*Boehmeria cylindrica*), flat-seeded cutgrass (*Leersia lenticularis*), and Virginia dayflower (*Commelina virginica*).

### Federally-Listed Species Known From York and Cherokee Counties

Table 2 includes both federally- and state-listed endangered, threatened, and otherwise noteworthy species (species that are not listed by federal or state officials that the author or Duke Energy has deemed noteworthy for a specific reason) known from York County, South Carolina. Species listed by the U. S. Fish and Wildlife Service (federally-listed species) and those waiting to be listed (candidate species) are given in bold type. Three federally-listed species and one federal candidate species are known to occur or have occurred in York County. They are: pool sprite (*Amphianthus pusillus*) (Threatened), bald eagle (*Haliaeetus leucocephalus*) (Threatened), Schweinitz' sunflower (*Helianthus schweinitzii*) (Endangered), Georgia aster (*Aster georgianus*) (Candidate). The possible presence of these species at the Catawba site and its related power transmission rights-of-way is discussed below:

**Pool Sprite; Snorkelwort.** Pool sprite is found in shallow vernal pools on granite flatrocks. It is not known near the Catawba Site, but it has been reported from a rock outcrop near one of the transmission lines in the project area. A five-mile (8 km) section of the transmission line near this population was checked closely for granitic flatrocks that may harbor this federally-listed threatened species. Although several small outcrops and some boulder fields were found, no habitat for this species occurred.

**Bald Eagle.** Although habitat for the threatened bald eagle exists around Lake Wylie, no nesting sites are currently known within the Catawba site or along the related power transmission lines. An abandoned nest, not known to have been active in over a decade, is found one mile (1.6 km) southeast of the Exclusion Area.

**Schweinitz' sunflower.** Schweinitz' sunflower, listed as endangered by the U. S. Fish and Wildlife Service, is found in glade-like woods or in nonforested areas over magnesium- and calcium-rich soils such as the Iredell type. No Iredell soils are found at the Catawba site itself within the Exclusion Area; however, there are several populations of the sunflower 3.0 miles (4.8 km) south of the Catawba site. An inventory of transmission lines near known populations of the plant revealed that no Schweinitz' sunflowers were growing within the transmission line rights-of-way.

**Georgia Aster.** Georgia aster is a "candidate" species for listing by the U. S. Fish and Wildlife Service. This status means that the U. S. Fish and Wildlife Service has already determined that it should be listed and the species is awaiting listing. It is known from the Piedmont of South Carolina on Iredell and other basic and circumneutral soils in openings and in disturbed areas. In York County, however, it occurs in the western portion of the county on more acidic soils associated with the Kings Mountain geological belt. Although several populations of the aster are found north of the Allison Creek Tap to Ripp Switching transmission in Cherokee County, no plants of this species were found along the actual rights-of-way or within the Catawba Exclusion Area.

**Dwarf-flowered Heartleaf.** The western portion of the Allison Creek Tap to Ripp Switching transmission right-of-way passes through the northeastern corner of Cherokee County, South Carolina. Dwarf-flowered heartleaf, federally-listed as threatened (Table 2), is known from Cherokee County. Most populations of the rare heartleaf, however, are found in central and western Cherokee County. The plant has not been reported from the Kings Mountain geological belt in northeastern Cherokee County. In the spring of 1999, I examined several populations of heartleaves in the Kings Mountain belt of North and South Carolina—all populations turned out to be the Piedmont heartleaf (*Hexastylis minor*). Several populations of what I assumed to be Piedmont heartleaf are found in ravines and on bluffs of the Allison Creek Tap to Ripp Switching transmission right-of-way south of Ripp Switching Station. Spring inventories of these sites will be conducted for positive determination of species. None of these populations, however, actually occur within the right-of-way of the transmission line.

#### State-Listed Species Known from York and Cherokee Counties

Table 2 presents South Carolina state-listed species that are known to occur or have occurred in York and Cherokee counties. Of the 40 state-listed species known from York County, 36 are vascular plants, two are amphibians, one is a mollusk, and one is a fish. Additionally, South Carolina Department of Natural Resources lists two habitat types—monadnock and [rock] outcrop—as noteworthy types in York County. Species underlined in Table 2 are found within 0.5 mile (0.8 km) of the Catawba site Exclusion Area or one of its related transmission lines.

No state-listed species were found in the Exclusion Area or within the rights-of-way of any transmission lines related to the Catawba relicensing project. One plant new to South Carolina—showy skullcap (*Scutellaria serrata*)—was growing on a rich bluff just south of one of the transmission rights-of-way. This record will be brought to the attention of the South Carolina Department of Natural Resources and will be included in Duke Power's vegetation management database.

#### Wetlands of the Project Area

The wetlands of the project area are discussed in detail in the section Plant Communities and Habitats Present within the Project Area above. Figure 1 illustrates eleven wetlands within the Catawba site Exclusion Area and three wetlands just outside of the Exclusion Area. Duke Power (1999) also contains information and maps on the wetlands of the Catawba site.

As discussed earlier, the wetlands of the project area are small bottomlands, beaver ponds, disturbed seepages, creek banks, and artificial impoundments. Most of the wetlands, with the exception of the bottomlands and creek banks, are in an early successional stage. Only 7.1 percent of the Exclusion Area is wetland. About 75-90 percent of these wetlands would probably be considered jurisdictional in the sense of the U. S. Army Corps of Engineers (1987). Site environmental work policies filed by Duke Power prohibit construction work in wetlands.

### Significant Natural Areas

Several mature mixed hardwood ravines were found on the shores of Lake Wylie in the southern portion of the Catawba Site Exclusion Area (Figure 1). Here, good stands of chalk maple are found in the understory of middle-aged mixed hardwood stands. The most significant natural community within the project area, however, is a northwest-facing dry bluff adjacent to Catawba Park, a boat-landing/recreation area in the northern portion of the Exclusion Area.

Here, scattered mature southern red oak, white oak, black oak [trees to 28 inches (71 cm) in diameter at breast height], slippery elm (*Ulmus rubra*), and mockernut hickory dominate the bluff with widely scattered shortleaf pine. Sourwood, eastern red cedar, dogwood, and excellent open stands of mature chalk maple are found in the understory. The herbaceous layer is also relatively open with spotted wintergreen, round-leaved beggar-ticks (*Desmodium rotundifolium*), and common heartleaf (*Hexastylis arifolia*) were common. This community resembles the Oak-Chalk Maple glade type that is known from mafic and calcareous sites in the Piedmont of the Carolinas. In most known dry, open, glade-like chalk maple communities, however, the canopy dominant is usually chestnut oak (*Quercus prinus*); here, the dominant tree is black oak (*Quercus velutina*). This site therefore harbors what may be a rare and little-known Piedmont community type in South Carolina.

### Transmission Rights-of-Way Related to the Catawba Relicensing Project

Transmission rights-of-way related to the relicensing of the Catawba Nuclear Station include approximately 42.4 miles (68.3 km) of right-of-way. These rights-of-way are listed in Table 3. Duke Energy has a well-established set of management practices for transmission line right-of-way maintenance (Duke, 1996). These best management practices include: erosion and sediment control, soil stabilization, stream and wetland protection, and protection of sensitive areas and sensitive species. Vegetation control of the transmission lines of the project has historically involved mowing and/or treatment with herbicides.

Table 3. Power Transmission Lines in Miles (Kilometers) Related to the Relicensing Permit  
for the Catawba Nuclear Station, York County, South Carolina.

	Catawba-Allen	Catawba-Ripp	Catawba-Pacolet	Catawba-Newport (Allison Creek B&W)	Catawba-Newport (Newport B&W)	Totals
Total R/W Length mi(km)	10.9(17.5)	24.4(39.3)	1.2(1.9)	0.7 (1.1)	5.2(8.4)	42.4(68.3)
Comments	9.6(15.5) rebuilt; 1.3(2.1) new	24.4(39.3) all new	Extended line 1.2(1.9) from former Allison Creek tie; no work performed on remainder of line	0.7(1.1) new line; 4.5(7.2) removed from service	5.2(8.4) all new	

The vegetation in the transmission rights-of-way associated with the project was predominantly herbaceous and graminaceous and varied considerably with moisture regime and slope position. Although tag alder and black willow often sprouted along seepages wetlands and on the back waters of beaver ponds, most of the vegetation of the rights-of-way consists of old-field and disturbed area nonforested species such as grasses of the genera *Andropogon* (bluestems), *Aristida* (wire-grasses) and herbs of the composite family such as *Helianthus* (sunflowers), *Solidago* (goldenrods), and *Aster* (asters). The vascular plant species list in the Appendix includes all vascular plant species encountered along the transmission line rights-of-way.

Intensive surveys were done on the western portion of the Allison Creek Tap to Ripp Switching right-of-way for Georgia aster, which has been reported from near the right-of-way, and for dwarf-flowered heartleaf, which is known from Cherokee County. The central portion of the transmission line was checked for granite flatrocks along a two-mile (3.2 km) section near where populations of one-flowered stichwort (*Minuartia uniflora*) and pool sprite (*Amphianthus pusillus*), two listed plant species (Table 2), are known to exist. Several populations of Schweinitz' sunflower have been reported from near the Catawba Switching to Newport Tie right-of-way along SC Highway 274. Here, an intensive inventory for Schweinitz' sunflower was conducted along the right-of-way in early autumn, but no plants of the rare sunflower could be found.

In summary, no federally-listed or state-listed plants or animals or good habitat for such species were found within the rights-of-way of transmission lines related to the relicensing of the Catawba Nuclear Station.



## SUMMARY AND CONCLUSIONS

The Catawba Nuclear Station relicensing project area consists of a 450.5-acre (182.4 ha) Exclusion Area [a circle with a 2500-foot (757.6 m) radius centered at the reactors] and approximately 42.4 miles (68.3 km) of related power transmission line right-of-way. The findings of an inventory for endangered species, wetlands, and natural areas carried out in the summer and fall of 2000 are summarized below:

1. Five major plant community/habitat types were found within the Exclusion Area. Most of the Exclusion Area is non-forested, open land and open water; currently, approximately 36% of the Exclusion Area is forested.
2. Eleven small wetlands totaling approximately 34 acres (ca. 14 ha) occur within the Exclusion Area. Several significant natural areas, including mixed hardwood ravines and one small mature stand of a dry slope oak-chalk maple forest, were found during the course of the biological inventory of the Exclusion Area.
3. Intensive surveys of the Exclusion Area and related power transmission line rights-of-way revealed that no state- or federally-listed species or critical habitat for such species occur within the Exclusion Area or within the related rights-of-way.

### Literature Cited

- Duke Power Company. 1975. Catawba Nuclear Station Environmental Report. Volume 2. Sections 3.0-12.0 plus Appendix.
- Duke Power Company. 1996. Duke Power Best Management Practices for Vegetation Management, Stormwater Management, and Erosion Control on Power Transmission Rights-of-Way. Duke Policy and Procedures Manual. Charlotte, North Carolina.
- Duke Power Company. 1999. Environmental Work Practice 3.2. Wetlands (Environmentally Sensitive Areas)—Catawba Nuclear Site. Charlotte, North Carolina.
- Federal Interagency Committee for Wetland Delineation. 1989. Federal manual for Identifying and Delineating Jurisdictional Wetlands. U. S. Army Corps of Engineers, U. S. Environmental Protection Agency, U. S. Fish and Wildlife Service, and U. S. D. A. Soil Conservation Service. Washington, D. C. Cooperative Technical Publication. 131 pp.
- U. S. Nuclear Regulatory Commission. 1973. Environmental Statement related to the proposed Catawba Nuclear Station Units 1 and 2. Doc. Nos. 50-413 and 50-414.

## Appendix

VASCULAR PLANTS OF THE CATAWBA NUCLEAR STATION AND  
ASSOCIATED TRANSMISSION LINE RIGHTS-OF-WAY

COMMUNITIES

P-Pine

PMH—Pine-Mixed Hardwoods

MH—Mixed Hardwoods

WET—Wetlands

ROW/CL—Power Line Rights-of-Way/Cleared Areas

\*Introduced species

*Acer leucoderme* (chalk maple) MH

*Acer negundo* (box elder) WMH

*Acer rubrum* (red maple) MH, WET, PMH

\**Albizzia julibrisin* (mimosa) ROW

*Allium bivalve* (false garlic) ROW

*Alnus serrulata* (tag alder) WET

*Amelanchier arborea* (sarvisberry) MH

*Amorpha fruticosa* (lead bush) MH

\**Analeima keisak* (Asiatic dayflower) WET

*Andropogon virginicus* (broomsedge) ROW

*Antennaria plantaginifolia* (pussy-toes) MH

*Apios americanus* (ground nut) WET

*Aristolochia serpentaria* (Virginia snakeroot) MH

*Aster solidagineus* (flat-topped aster) ROW

*Baccharis halimifolia* (salt bush) WET

*Bidens bipinnatifida* (Spanish needles) WET

*Bignonia capreolata* (cross vine) MH, WET

*Boehmeria cylindrica* (false nettle) WET

*Botrychium virginianum* (rattlesnake fern) MH

*Campsis radicans* (trumpet creeper) ROW, WET

*Carex crinita* (fringed sedge) MA

*Carex flaccosperma* (thin-fruited sedge) WET

*Carex frankii* (Frank's sedge) WET

*Carex lurida* (shallow sedge) WET

*Carex nigromarginata* (black-edged sedge) PMH, MH

*Carex striatula* (striatulate sedge) MH

*Carpinus caroliniana* (ironwood) WET, MH

*Carya glabra* (pignut hickory) MH

*Carya tomentosa* (mockernut hickory) PMH, MH

*Celtis occidentalis* (sugarberry) MH

*Cephalanthus occidentalis* (buttonbush) WET

*Cercis canadensis* (redbud) MH

*Chimaphila maculata* (pipsissewa) PMH, MH  
*Clitoria mariana* (butterfly-pea) ROW, PMH  
*Commelina virginiana* (Virginia dayflower) WET  
*Cornus florida* (dogwood) MH  
*Crataegus* sp. (hawthorn) ROW  
*Cynoglossum virginianum* (Virginia hound's tongue) MH  
*Cyperus* sp. 1 (flat-sedge) ROW  
*Cyperus* sp. 2 (flat-sedge) WET  
*Danthonia* sp. (oat grass) ROW  
*Daucus carota* (Queen Anne's lace) ROW  
*Desmodium nudiflorum* (beggar-ticks) MH  
*Desmodium rotundifolium* (round-leaved beggar-ticks) MH  
*Desmodium virginianum* (Virginia beggar-ticks) PMH, MH, ROW  
*Dioscorea villosa* (wild yam) MH  
*Diospyros virginiana* (persimmon) MH  
*Duchesnea indica* (Indian strawberry) ROW  
*\*Eleagnus umbellata* (silverberry) MH, PMH  
*Eleocharis baldwinii* (Baldwin's spikerush) WET  
*Elephantopus* sp. (elephant's foot) ROW  
*Elymus* sp. (wild rye grass) ROW, WET  
*Eragrostis* sp. (love grass) ROW  
*Erechtites hieracifolia* (fireweed) ROW  
*Erianthus* sp. (plume grass) ROW  
*Erigeron pulchellus* (daisy fleabane) MH  
*Erigeron* sp. (fleabane) ROW  
*Eryngium prostratum* (creeping eryngium) WET  
*Euonymus americanus* (American euonymus, hearts-a-bursting) MH, PMH  
*Eupatorium album* (white thoroughwort) PMH, MH  
*Eupatorium capillifolium* (dog fennel) ROW/CL  
*Eupatorium* sp. (thoroughwort) ROW  
*Euphorbia corollata* (spurge) MH  
*Fagus grandifolia* (American beech) MHP  
*\*Festuca* sp. (fescue) ROW  
*Fraxinus americana* (white ash) MH  
*Fraxinus pennsylvanica* (green ash) WET  
*Galium circaezans* (bedstraw) MH  
*Gelsemium sempervirens* (yellow jessamine) ROW  
*Gnaphalium* sp. (rabbit tobacco) ROW  
*Helenium* sp. (sneezeweed) ROW  
*Helianthus atrorubens* (red-stemmed sunflower) ROW  
*Helianthus* sp. (sunflower) ROW  
*Heliathus microcephalus* (small-headed sunflower) PMH  
*Hepatica americana* (American liverleaf) MH  
*Heterotheca subaxillaris* (camphorweed) ROW  
*Hexastylis arifolia* (common heartleaf) MH  
*Houstonia purpurea* (broad-leaved bluet) MH

*Hypericum punctatum* (spotted St. Johns-wort) ROW  
*Hypericum hypericoides* (St. Johns-wort) MHP, P, ROW  
*Ilex opaca* (American holly) MH, PMH  
*Juncus canadensis* (Canada needlerush) WET  
*Juncus coriaceous* (tough needlerush) WET  
*Juncus effusus* (common needlerush) WET, ROW  
*Juncus* sp. (needlerush) ROW  
*Juniperus virginiana* (eastern red cedar) PMH, MH, ROW  
*Leersia lenticularis* (flat-seeded cutgrass) WET  
*\*Lespedeza cuneata* (sericea) ROW  
*Liatris squarrosa* (spreading blazing star) ROW  
*\*Ligustrum sinensis* (Chinese privet) ROW, WET  
*Liquidambar styraciflua* (sweet gum) P, MH, PMH, WET  
*Liriodendron tulipifera* (tulip poplar) MH, PMH, WET  
*\*Lonicera japonica* (Japanese honeysuckle) PMH, P, MH, ROW  
*Lotus* sp. (trefoil) ROW  
*Ludwigia alternifolia* (alternate-leaved seedbox) ROW  
*Ludwigia glandulosa* (glandular seedbox) WET  
*\*Ludwigia uruguayensis* (Uruguayan seedbox) WET  
*Lycopodium flabelliforme* (ground cedar) P  
*\*Melia azedarach* (Chinaberry) ROW/CL  
*\*Melilotus albus* (tall white clover) ROW/CL  
*\*Microstegium vimineum* (Nepalese browntop) ROW  
*Morus rubra* (red mulberry) MH  
*Nyssa biflora* (swamp tupelo) WET  
*Nyssa sylvatica* (black gum) MH  
*Obolaria virginica* (pennywort) MH  
*Oenothera* sp. (evening primrose) ROW/CL  
*Oxydendrum arboreum* (sourwood) MH  
*Panicum boscii* (Bosc's panic grass) MH  
*Panicum dichotomum* (fall panicum) MHP  
*Parthenocissus quinquefolia* (Virginia creeper) PMH  
*Phytolacca americana* (pokeweed) ROW  
*Pinus echinata* (shortleaf pine) PMH  
*Pinus virginiana* (Virginia pine) P  
*Plantago lanceolata* (lance-leaved plantain) ROW  
*Platanus occidentalis* (sycamore) WET  
*Polystichum acrostichoides* (Christmas fern) MHP  
*Prenanthes trifoliata* (trifoliate rattlesnake root) PMH, MH  
*Prenanthes* sp. (gall-of-the-earth) P, PMH  
*\*Prunella vulgaris* (self-heal) ROW  
*Prunus serotina* (black cherry) ROW, P, PMH, MH  
*\*Pueraria lobata* (kudzu) ROW/CL  
*Quercus alba* (white oak) MH  
*Quercus falcata* (southern red oak) PMH, MH  
*Quercus marilandica* (blackjack oak) PMH

*Quercus nigra* (water oak) PMH  
*Quercus phellos* (willow oak) WET, MH  
*Quercus rubra* (red oak) MH  
*Quercus stellata* (post oak) MH, PMH  
*Quercus velutina* (black oak) MH  
*Rhus copallina* (winged sumac) ROW  
*Rhus glabra* (smooth sumac) ROW  
*Rhus radicans* (poison ivy) ROW, P, MH, PMH  
*Robinia pseudoacacia* (black locust) ROW, PMH  
*Rubus* sp. (blackberry) ROW  
*Ruellia carolinensis* (Carolina wild petunia) MH  
*Salix nigra* (black willow) WET, ROW  
*Sambucus canadensis* (elderberry) WET  
*Sanicula* sp. (snakeroot) MH  
*Schrankia microphylla* (sensitive brier) ROW  
*Scleria triglomerata* (nutrush) P, PMH, MH  
*Scutellaria integrifolia* (skullcap) MH  
*Scutellaria serrata* (serrate-leaved skullcap) ROW, MH  
*Senecio anonymus* (Small's ragwort) ROW  
*Silene virginica* (fire pink) ROW  
*Silphium angustifolium* (narrow-leaved rosinweed) ROW  
*Smilacina racemosa* (false Solomon's seal) MH  
*Smilax bona-nox* (cat-brier) ROW  
*Smilax rotundifolia* (round-leaved greenbrier) P, PMH  
*Smilax* sp. (greenbrier) PMH  
*Solidago altissima* (tall goldenrod) ROW  
*Solidago odora* (licorice goldenrod) ROW, PMH, MH  
*Solidago* sp. (goldenrod) ROW  
*Spiranthes grayi* (Gray's ladies-tresses) MH  
*Stellaria media* (chickweed) MH  
*Tiarella cordifolia* (foamflower) MH  
*Tipularia discolor* (crane-fly orchid) MH  
*Tragia urens* (tragia) PMH  
*Ulmus alata* (winged elm) MH, PMH  
*Ulmus americana* (American elm) WET, MH  
*Ulmus rubra* (slippery elm, red elm) MH  
*Uvularia perfoliata* (perfoliate bellwort) MH  
*Vaccinium arboreum* (sparkleberry) P, MHP, MH  
*Vaccinium stamineum* (squawberry) P, PMH, MH  
*Vernonia* sp. (ironweed) WET  
*Viburnum prunifolium* (black haw) P, PMH, MH  
*\*Vinca minor* (lesser periwinkle) PMH  
*Viola* sp. (violet) MH  
*Vitis aestivalis* (summer grape) MH  
*Vitis rotundifolia* (muscadine) PMH, WET, MH