

CP&L

BSEP-00

Memo

To: Mr. J. W. Johnson
Mr. J. C. Nuckles, Jr.
Mr. A. Eaddy

From: Cam Wheeler

Date: August 12, 1998

Subject: Threatened and Endangered Species
Self-Assessment Report

As earlier requested, attached are self assessment reports for compliance with threatened and endangered species at the three CP&L nuclear facilities. These assessments are in response to the NRC-issued report entitled "Threatened and Endangered Species for 75 Licensed Commercial Nuclear Power Generating Plants" (March 1997). The assessments have been prepared by the Biological Assessment Unit of the Environmental Services Section.

If there are questions, please let me know at Caronet 772-3288.



CCW/bjw

cc: Mr. G. B. Baird
Ms L. Cooper
Mr. W. R. Garrett
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Self Assessment of Carolina Power & Light Company's
Brunswick Steam Electric Plant for Compliance with
Threatened and Endangered Species
August 12, 1998

In March 1997, the Ecology Group of Pacific Northwest National Laboratory (PNNL) issued a report to the U.S. Nuclear Regulatory Commission entitled "Threatened and Endangered Species Evaluation for 75 Licensed Nuclear Power Generating Plants" (PNNL-11524). The purpose of the report was to evaluate the Nuclear Regulatory Commission's licensing of commercial nuclear generating facilities to determine compliance with the Endangered Species Act of 1973 (ESA). Such an evaluation was necessary because the ESA requires that federal agencies ensure that actions by one another do not jeopardize the species protected under the ESA.

The PNNL report included the Brunswick Steam Electric Plant and listed threatened and endangered species that might be impacted by plant activities. The PNNL assigned low, medium, or high priority for follow up regarding the potential for impacts to species at the nuclear facilities. Those facilities with a high-priority ranking were deemed, according to the PNNL report, in need of detailed follow-up evaluations before full ESA compliance can be assured. The Brunswick was given High Priority for sea turtles, manatees, terrestrial species, and other aquatic species.

The purpose of this CP&L self assessment is to evaluate the PNNL report to determine what activities by Brunswick personnel need to be considered for compliance with the ESA for any species actually or likely occurring on Company property at the site. Transmission rights-of-way were assessed only to the Company property boundary. Beyond the property boundary, CP&L has easements on power line corridors on land that is privately owned. However, any known locations on power line corridors in North Carolina of rare, threatened, or endangered species are protected by management agreement with the North Carolina Natural Heritage Program.

This self assessment was carried out by considering the species identified in the PNNL report, assessing the potential for their actual occurrence at the site, and what activities, if any, need to be considered to prevent such species impact. The CP&L self assessment compared the list of potential species from the PNNL report to the current federally protected species and any considered state threatened, endangered, and special concern species as listed by the North Carolina Natural Heritage Program.

The results of the self assessment for the Brunswick Steam Electric Plant are shown in Table 1. This table lists the species of animals and plants identified in the PNNL report, the current U.S. Fish & Wildlife Service list of protected species for North Carolina, and the species from the natural heritage program for North Carolina. The latter state list identifies species at the county level in which the nuclear facility is located. The status of each species (e.g., whether endangered, threatened, etc.) at the federal or state level is also identified in Table 1 showing their

known occurrence in proximity to the nuclear plants (in some cases adjacent counties), and actions, if any, required to avoid impact to these species.

An evaluation was made of the species that reasonably could be impacted by plant activities. The results of the evaluation are provided in Exhibit 1. Recommended actions required of CP&L are also suggested.

A proposed modification addition to the Environmental Self-Assessment Program "Other Items" Compliance Checklist is included as Exhibit 2 as a means of continuing this assessment on an on-going basis.

Included as Exhibit 3 is the current federally listed plants and animals for North Carolina.

Attached as Exhibit 4 is a Literature Review and Sources Used for this self assessment.

Summary:

The report issued by the PNNL included species of plants and animals that were in part extracted from state natural heritage program lists, and were thus not federally endangered or threatened. For this reason, this CP&L self assessment was expanded to include reviews of currently listed endangered, threatened, special concern species, as well as other species designations made by heritage program staff of North Carolina. While this state list does not carry the same regulatory status as the federal U.S. Fish & Wildlife Service list, it is included in this self assessment to more accurately assess the species of concern. The state listed species have the potential for future federal listing and, hence, they are "candidate species."

The self-assessment evaluation of the Brunswick Steam Electric Plant shows there are six federally protected species that could be impacted by plant operations, facility expansion, or other activities. The results of the assessment show that the only known instances where nuclear plant operations are having an effect on a federally listed species are sea turtles at the Brunswick Steam Electric Plant. In that case, CP&L is currently cooperating with the Nuclear Regulatory Commission and the National Marine Fisheries under a Section 7 Consultation of the Endangered Species Act. Resolution is expected later in 1998.

Ongoing communication, regarding activities that potentially could affect threatened and endangered species, is recommended between plant personnel and personnel in CP&L's Environmental Service Section, Real Estate Management Section, and the Transmission Department.

Exhibit 1. Federally Protected Species at or near CP&L's Brunswick Steam Electric Plant Requiring Action to Prevent Impact to Species

Species	Recommendations for Reducing Impact to Listed Species*
Red-cockaded woodpecker	Facility expansion or construction requiring removal of pine trees requires on-site assessment for occurrence.
Loggerhead sea turtle	Potential for impingement; blocker panel maintenance; canal patrols
Green sea turtle	Potential for impingement; blocker panel maintenance; canal patrols
Kemp's Ridley sea turtle	Potential for impingement; blocker panel maintenance; canal patrols
Rough-leaved loosestrife (plant)	Population is known on ROW off site and is protected and managed by CP&L in agreement with N.C. Natural Heritage Program.
Cooley's meadowrue (plant)	Population is known on ROW off site and is protected and managed by CP&L in agreement with N.C. Natural Heritage Program.

*Note: CP&L resources for consultation include personnel in the Environmental Service Section, Real Estate Management Section, and the Transmission Department.

Under the Endangered Species Act, a Section 7 Consultation among federal agencies is required if a listed species is being impacted. One avenue for resolution includes an incidental take statement.

Exhibit 3. U.S. Fish & Wildlife Service List of Endangered and Threatened Species in North Carolina.

North Carolina--53 species

Animals--27 species

- E - Bat, Indiana (*Myotis sodalis*)
- E - Bat, Virginia big-eared (*Plecotus townsendii virginianus*)
- E - Butterfly, Saint Francis' satyr (*Neonympha mitchellii francisci*)
- T - Chub, spotfin (=turquoise shiner) (*Cyprinella (=Hybopsis) monacha*)
- T - Eagle, bald (*Haliaeetus leucocephalus*)
- E - Elktoe, Appalachian (*Alasmidonta raveneliana*)
- E - Falcon, American peregrine (*Falco peregrinus anatum*)
- E - Heelsplitter, Carolina (*Lasmigona decorata*)
- E - Manatee, West Indian (=Florida) (*Trichechus manatus*)
- E - Mussel, dwarf wedge (*Alasmidonta heterodon*)
- E - Pearlymussel, little-wing (*Pegias fabula*)
- E - Plover, piping (*Charadrius melodus*)
- E - Shiner, Cape Fear (*Notropis mekistocholas*)
- T - Shrew, Dismal Swamp southeastern (*Sorex longirostris fisheri*)
- T - Silverside, Waccamaw (*Menidia extensa*)
- T - Snail, noonday (*Mesodon clarki nantahala*)
- E - Spider, spruce-fir moss (*Microhexura montivaga*)
- E - Spiny mussel, Tar River (*Elliptio steinstansana*)
- E - Squirrel, Carolina northern flying (*Glaucomys sabrinus coloratus*)
- E - Tern, roseate (*Sterna dougallii dougallii*)
- E - Turtle, Kemp's (=Atlantic) ridley sea (*Lepidochelys kempii*)
- T - Turtle, green sea (*Chelonia mydas*)
- E - Turtle, hawksbill sea (*Eretmochelys imbricata*)
- E - Turtle, leatherback sea (*Dermochelys coriacea*)
- T - Turtle, loggerhead sea (*Caretta caretta*)
- E - Wolf, red (*Canis rufus*)
- E - Woodpecker, red-cockaded (*Picoides borealis*)

Plants--26 species

- E - American chaffseed (*Schwalbea americana*)
- T - Blue Ridge goldenrod (*Solidago spithamea*)
- E - Bunched arrowhead (*Sagittaria fasciculata*)
- E - Canby's dropwort (*Oxypolis canbyi*)
- E - Cooley's meadowrue (*Thalictrum cooleyi*)
- T - Dwarf-flowered heartleaf (*Hexastylis naniflora*)
- E - Green pitcher-plant (*Sarracenia oreophila*)
- E - Harperella (*Ptilimnium nodosum (=fluviatile)*)
- T - Heller's blazingstar (*Liatris helleri*)

- E - Michaux's sumac (*Rhus michauxii*)
- T - Mountain golden heather (*Hudsonia montana*)
- E - Mountain sweet pitcher-plant (*Sarracenia rubra* ssp. *jonesii*)
- E - Pondberry (*Lindera melissifolia*)
- E - Roan Mountain bluet (*Hedyotis purpurea* var. *montana*)
- E - Rock gnome lichen (*Gymnoderma lineare*)
- E - Rough-leaved loosestrife (*Lysimachia asperulaefolia*)
- E - Schweinitz's sunflower (*Helianthus schweinitzii*)
- T - Seabeach amaranth (*Amaranthus pumilus*)
- T - Sensitive joint-vetch (*Aeschynomene virginica*)
- T - Small whorled pogonia (*Isotria medeoloides*)
- E - Small-anthered bittercress (*Cardamine micranthera*)
- E - Smooth coneflower (*Echinacea laevigata*)
- E - Spreading avens (*Geum radiatum*)
- T - Swamp pink (*Helonias bullata*)
- T - Virginia spiraea (*Spiraea virginiana*)
- E - White irisette (*Sisyrinchium dichotomum*)

Code:

E = Endangered

T = Threatened

Exhibit 4. Literature Review and Sources Used for Self Assessment.

- Amoroso, Jame L. 1997. Natural Heritage Program List of the Rare Plant Species of North Carolina. N.C. Department of Environment, Health and Natural Resources, Raleigh, N.C.**
- Amoroso, Jame L. N.C. Department of Environment, Health and Natural Resources, Raleigh, N.C. Personal Communications. June 16, 1998, with Richard C. Yates (CP&L).**
- LeGrand, Harry E. N.C. Department of Environment, Health and Natural Resources, Raleigh, N.C. Personal Communications. June 16, 1998, with Richard C. Yates (CP&L).**
- LeBlond, Richard J. 1995. Inventory of the Natural Areas and Rare Species of Brunswick County North Carolina. N.C. Department of Environment, Health and Natural Resources, Raleigh.**
- LeGrand, Harry E., and Stephen P. Hall. 1997. Natural Heritage Program List of the Rare Animal Species of North Carolina. N.C. Department of Environment, Health and Natural Resources, Raleigh.**
- North Carolina Natural Heritage Program. 1995. Natural Heritage Areas Priority List. N.C. Department of Environment, Health and Natural Resources, Raleigh.**
- North Carolina Natural Heritage Program. 1997. County Species List. N.C. Department of Environment, Health and Natural Resources, Raleigh.**
- Sackschewsky, M. R. 1997. Threatened and Endangered Species Evaluation for 75 Licensed Commercial Nuclear Power Generating Plants. Pacific Northwest National Laboratory, Richland, WA.**
- United States Fish & Wildlife Service. 1998. Endangered Species Home Page [Internet Site]. <http://www.fws.gov/r9endspp/endspp.html>**

8/12/98

Table 1. Evaluation of Threatened and Endangered Species Reported at Carolina Power and Light Company's Brunswick Steam Electric Plant.

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
Birds <i>Aimophila aestivalis</i>	Bachman's sparrow	FSC/SC	Not known on site.	None known	Coastal plain and piedmont species; open longleaf pine forests and old fields Documented in the longleaf pine savannas of the Green Swamp in central Brunswick Co.
<i>Ammodramus henslowii</i>	Henslow's sparrow	FSC/SR	Transitory on site. Has been sighted in the surrounding Southport/Oak Island area during the annual Christmas bird count since 1987.	None known	Coastal plain species; clearcut pososins and other damp weedy fields
<i>Charadrius melodus</i>	piping plover	T/T	Transitory on site. One specimen has occasionally been sighted in the BSEP's return basin during the annual Christmas bird count since 1987.	None known	Tidewater areas; ocean beaches and island-end flats
<i>Falco peregrinus</i>	peregrine falcon	E/E	Transitory on site. Has been sighted in the surrounding Southport/Oak Island area during the annual Christmas bird count since 1987.	None known	Cliffs (for nesting); coastal ponds and mudflats
<i>Haliaeetus leucocephalus</i>	bald eagle	T/E	Transitory on site.	None known	Mature forests near large

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
			Has been sighted in the surrounding Southport/Oak Island area during the annual Christmas bird count since 1987.		bodies of water; lakes and sounds
<i>Mycteria americana</i>	wood stork	E/E	Not known on site as a regular visitor. Company biologist observed two specimens in the BSEP return basin for a period of 2-3 days during 1987.	None known	Tidewater areas: fresh or brackish ponds
<i>Passerina ciris ciris</i>	Eastern painted bunting	FSC/SR	Company biologist have routinely observed this species foraging along the intake canal road. Has also been observed along the discharge canal at Caswell Beach.	None known	Tidewater areas: maritime shrub thickets and forest edges
<i>Picoides borealis</i>	red-cockaded woodpecker	E/E	Historically known near site. Has been sighted in the surrounding Southport/Oak Island area during the annual Christmas bird count since 1987.	None known	Facility expansion involving removal of large, old long-leaf pine trees will need to be assessed for its occurrence
<i>Sterna dougalii dougalii</i> +	roseate tern	E/E	Not known on site.	None known	sand flats on maritime islands
Insects <i>Agrotis nr. buchholzi</i>	Buchholzi' dart moth	FSC/SR	Not known on site.	None known	Flatwoods with pixie moss in the coastal plain

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Problema bulenta</i>	Rare skipper	FSC/SR	Not known on site.	None known	Fresh to brackish marshes in the Wilmington area. Host plant is southern wild rice.
<i>Neonympha mitchellii francisci</i> +	Saint Francis' satyr butterfly	E/SR	Not known on site	None known	Boggy areas, beaver ponds, and pocosin margins with sedges in sandhills. Host plant sedges.
Clams <i>Elliptio waccamawensis</i>	Waccamaw spike (mussel)	FSC/T	Not known on site	None known	Lake Waccamaw and vicinity
Snails <i>Planorbella magnifica</i> *(N)	magnificent rams-horn	FSC/E	Not known on site	None known	The only two remaining populations known are located at Orton Pond and on the Pleasant Oaks Plantation north of the BSEP.
<i>Helisoma eucosmium</i> = <i>Taphius eucosmius eucosmius</i> *(N)	Greenfield rams-horn	FSC/SR	Not known on site	None known	The only known remaining population is located in Town Creek, north of the BSEP.
<i>Triodopsis soelneri</i> *(N)	Cape Fear threetooth	FSC/T	Not known on site	None known	Swampy habitats in the extreme southeastern corner of the state. Endemic to North Carolina. Has been documented at Sunny Point Military Ocean Terminal (MOTSU).
Amphibians <i>Rana areolata capito</i> (= <i>R. capito capito</i>)	Carolina crawfish frog (= gopher frog)	FSC/SC	Not known on site	None known	Breeds in temporary fish-free pools; forages in sandy woods, especially pine-oak sandhills. Species has been documented at MOTSU and the White Spring Ponds complex located along the MOTSU access road.
Reptiles <i>Caretta caretta</i>	loggerhead sea turtle	T/T	Has been collected in	Potential for entrapment	Nest on local beaches. Forages

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			the intake canal	on the trash racks at the Plant. Intake modifications to reduce impingement of organisms including turtle blocker panels should minimize entry into the intake canal. Procedures are in place for the live capture, tagging, and release of sea turtles should one enter the canal.	in the middle and lower estuary. CP&L has participated in section 7 consultation with the NRC, USFWS, and the NMFS (January 1998).
<i>Chelonia mydas</i>	green sea turtle	T/T	Has occasionally been collected in the intake canal.	Same as for <i>Caretta caretta</i> .	Same as for <i>Caretta caretta</i> .
<i>Dermochelys coriacea</i>	leatherback sea turtle	E/E	None on site	None known	Remains in the ocean, rarely enters the estuary.
<i>Eretmochelys imbricata</i>	hawksbill sea turtle	E/E	None on site	None known	Remains in the ocean, rarely enters the estuary.
<i>Lepidochelys kempii</i>	Kemp's Ridley sea turtle	E/E	Has occasionally been collected in the intake canal.	Same as for <i>Caretta caretta</i> .	Same as for <i>Caretta caretta</i> .
<i>Ophisaurus mimicus</i>	mimic glass lizard	FSC/SC	Not known on site	None known	Habitat is pine flatwoods, pine/oak sandhills, other pine-oak forests
<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	FSC/SC	Not known on site	None known	Habitat is dry and sandy woods, mainly pine-oak sandhills
<i>Alligator mississippiensis</i> *	American alligator	T(SA)/T	Widespread distribution in the Walden Creek, Intake and Discharge canals	None known. No alligator has ever died as a result of operation of the BSEP. Construction and timbering activities may disturb nest sites.	The American alligator is listed as threatened solely due to similarity of appearance with other rare crocodylians. This species is not biologically endangered or threatened and is not subject to section 7 consultation.

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Malaclemys terrapin centrata*</i>	Carolina diamondback terrapin	/SC	Has occasionally been collected in Walden Crk. And the intake canal during biological sampling.	Potential for impingement of adults. Intake modifications designed to reduce impingement should minimize impact.	Salty or brackish marshes, southern half of the coast
<i>Sistrurus miliarius</i>	Pigmy rattlesnake *	/SR	Not known on site. Closest documented location was approximately 1-mile west of the Plant site adjacent to H.W. 133.	None known.	Pine flatwoods, pine/oak sandhills, other pine/oak forest Proposed for SC status but not adopted by NCWRC. Species is protected from taking.
Fishes					
<i>Acipenser brevirostrum</i>	shortnose sturgeon	E/E	Species is known from the lower Cape Fear river and thus the larvae and adults could be vulnerable to plant impact during spawning in late winter to early spring	None known; population is small and no individuals have ever been collected at BSEP.	Nine adults have been captured in the Cape Fear since 1987
<i>Acipenser oxyrhynchus *</i>	Atlantic sturgeon	/SC	Has occasionally been collected during biological sampling at the BSEP	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	Spawns in the upper Cape Fear River Estuary. Historically, this species was commercially fished in the Brunswick River.
<i>Elassoma boehlkei</i>	Carolina pigmy sunfish	FSC/T	Not known on site	None known	Unsuitable habitat; fresh water
<i>Menidia extensa</i>	Waccamaw silverside	T/T	Not known on site	None known	Unsuitable habitat; fresh water
<i>Hypsoblennius ionthus *</i>	freckled blenny	/SR	Has occasionally been collected during	potential entrainment of larvae and impingement	Prefers oyster reefs and hard substrates in the middle and

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
			biological sampling at the BSEP	of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	lower estuary. Ranges from North Carolina to the northern Gulf of Mexico.
<i>Microphis brachyurus</i> *	opposum pipefish	/SR	Has occasionally been collected during biological sampling at the BSEP	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	Ranges from North Carolina to the northern Gulf of Mexico. Species is rare throughout its entire range.
<i>Eleotris pisonis</i> *	spinycheek sleeper	/SR	Has occasionally been collected during biological sampling at the BSEP	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	Fresh to brackish ponds and estuaries; This species is at the extreme northern end of its range, thus this species is not abundant.
<i>Evorthodus lyricus</i> *	lyre goby	/SR	Has occasionally been collected during biological sampling at the BSEP	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	Shallow tidal water, salt marsh pools. This species is at the extreme northern end of its range, thus this species is not abundant.
<i>Gobionellus stigmaticus</i> *	marked goby	/SR	Has occasionally been collected during biological sampling at the BSEP.	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential	Shallow salt and brackish water This species is at the extreme northern end of its range, thus this species is not abundant.

Class/Species	Common Name	Status Fed/State	Location	Impact++ impact.	Comments
Mammals					
<i>Felis concolor cougar</i>	eastern cougar	E/E	Unconfirmed sightings on property in last three years.	None known	Extensive forest, remote areas
<i>Trichechus manatus</i>	West Indian manatee	E/E	Not known on site	None known	Warm estuarine waters, river mouths
<i>Sorex longirostris fisheri</i> +	Dismal Swamp Southeastern shrew	T/T	Not known on site	None known	Woodlands and brushy fields, especially where damp, in lower coastal plain
Plants					
<i>Asclepias pedicellata</i> *	savanna milkweed	/C	Not known on site	None known	Known in Brunswick County; dry savannas and moist flatwoods
<i>Amaranthus pumilus</i>	seabeach amaranth	T/T	Not known on site	None known	Occurs on ocean beaches and island-end flats including Brunswick County
<i>Amorpha georgiana confusa</i> *	savanna indigo bush	FSC/T	Not known on site	None known	Known in Brunswick County; wet savannas
<i>Amorpha georgiana georgiana</i>	Georgia indigo bush = Georgia lead-plant	FSC/T	Not known on site	None known	Possible suitable habitat of wet savannas on site
<i>Asplenium heteroresiliens</i>	Carolina spleenwort	FSC/E	Not known on site	None known	Not known in Brunswick County.
<i>Astragalus michauxii</i>	Sandhills milkvetch	FSC/C-PT	Not known on site	None known	Not known in Brunswick County
<i>Balduina atropupurea</i>	honeycomb head	SC/C	Not known on site	None known	Known <i>only</i> in Brunswick County in savannas
<i>Campylopus carolinae</i>	savannah campylopus	SC/C	Not known on site	None known	Known in Brunswick County in sandhills and savannas
<i>Carex chapmanii</i>	Chapman's sedge	SC/WI	Not known on site	None known	Known in Brunswick County in moist bottomlands; associated with marl
<i>Dichanthelium</i>	erectleaf witch grass	/SR	Not known on site	None known	Known in Brunswick County;

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>erectifolium</i> *					wet savannas
<i>Dionaea muscipula</i>	Venus flytrap	SC/C-SC	Known on power line ROWs from BSEP	None known	Expansion or construction activities need to consider possible presence of this species;
<i>Eleocharis robbinsii</i> *	Robbin's spikerush	/C	Not known on site	None known	Known in Brunswick County; limesink and beaver ponds and lakes
<i>Eleocharis rostellata</i> *	beaked spikerush	/C	Not known on site	None known	Known in Brunswick County; brackish marshes, limesink ponds
<i>Eupatorium leptophyllum</i> *	limesink dog fennel	/C	Not known on site	None known	Known in Brunswick County; limesink ponds and clay based Carolina bays
<i>Fimbristylis perpusilla</i>	Harper's fimbry	SC/T	Not known on site	None known	Known to exist in drawdown zones of blackwater rivers; occurs in Brunswick and Columbus counties
<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E/E	Not known on site	None known	Unsuitable habitat; nearest population is in the Piedmont N.C.
<i>Kalmia cuneata</i>	white-wicky	SC/E-SC-PC	Not known on site	None known	Unsuitable habitat; not known in Brunswick County
<i>Lachnocaulon beyrichianum</i> *	southern bogbutton	/SR	Not known on site	None known	Known in Brunswick County; sandhills, sandhill/pocosin ecotones
<i>Lilaeopsis carolinensis</i> *	Carolina grasswort	/T	Not known on site	None known	Known in Brunswick County; freshwater marshes and pools
<i>Lindera melissifolia</i>	pondberry (=Southern spicebush)	E/E	Not known on site	None known	Unsuitable habitat; not known in Brunswick County
<i>Litsea aestivalis</i>	pondspice	SC/C	Not known on site	None known	Species is known in Brunswick County; habitat is lime sinkponds and pools
<i>Ludwigia linifolia</i> *	flaxleaf seedbox	/SR	Not known on site	None known	Known in Brunswick County; limesink ponds
<i>Ludwigia suffruticosa</i> *	shrubby seedbox	/SR	Not known on site	None known	Limesink ponds, clay-based

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<i>Lysimachia asperulaefolia</i>	rough-leaved loosestrife	E/E	Known on BSEP power line ROWs off site	On site: none known; the off-site population is registered and protected with the N.C. Natural Heritage Program	Carolina bays Known in Brunswick County pocosin/savanna ecotones
<i>Macbridea caroliniana</i>	Carolina birds-in-a-nest (=Carolina bogmint)	SC/C-PT	Not known on site	None known	Species is present in Brunswick County; habitat is possibly on the site
<i>Myriophyllum laxum</i>	loose watermilfoil	FSC/T	Not known on site	None known	Known in Brunswick County; habitat is limesink ponds and natural lakes
<i>Oxypolis canbyi</i>	Canby's dropwort (=Canby's cowbane)	E/E	Not known on site	None known	Nearest population is Scotland County; clay-based Carolina bays habitat
<i>Oxypolis ternata</i>	Savanna cowbane (= Piedmont cowbane = Canby's cowbane)	SC/W	Not known on site	None known	Pine savannas/sandhills seeps
<i>Panicum tenerum</i> *	southeastern panic grass	/SR	Not known on site	None known	Known in Brunswick County; wet savannas and limesink ponds
<i>Parnassia caroliniana</i>	Carolina grass-of-parnassus	SC/E	Not known on site	None known	Known in Brunswick County in wet savannas
<i>Peltandra saggitifolia</i> *	spoonflower	/SR	Not known on site	None known	Known in Brunswick County; pocosins, other wet peaty sites
<i>Plantago sparsiflora</i>	pineland plantain	SC/E	Not known on site	None known	Known in Brunswick County in wet savannas
<i>Polygonum hirsutum</i> *	hairy smartweed	/SR	Not known on site	None known	Known in Brunswick County; limesink ponds, clay-based Carolina bays, drawdown zones of blackwater riverbanks
<i>Rhexia aristosa</i>	awned meadow-beauty	SC/T	Not known on site	None known	Known in Brunswick County; habitat is clay-based Carolina bays and limesink ponds
<i>Rhexia cubensis</i> *	West Indies meadow-beauty	/SR	Not known on site	None known	Known in Brunswick County; limesink ponds
<i>Rhynchospora decurrens</i>	swamp forest beaked-rush	SC/C	Not known on site	None known	Known in Brunswick County;

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Rhynchospora pleiantha</i> *	(=beaksedge) coastal beaksedge	/C	Not known on site	None known	habitat is swamp forest Known in Brunswick County; limesink ponds
<i>Rhynchospora scirpoides</i> *	long-beak baldsedge	/SR	Not known on site	None known	Known in Brunswick County; limesink and beaver ponds, wet savannas
<i>Rhynchospora thornei</i>	Thorne's beaked-rush (=beaksedge)	SC/C-PE	Not known on site	None known	Known in Brunswick County; habitat wet savannas
<i>Rhynchospora traceyi</i> *	Tracy's beaksedge	/SR	Not known on site	None known	Known in Brunswick County; limesink ponds, clay-based Carolina bays
<i>Rudbeckia heliopsidis</i>	blackeyed Susan (=sun-facing coneflower)	SC/E	Not known on site	None known	Not known in Brunswick County; habitat is pine flatwoods and woodland borders in Moore and Harnett counties
<i>Sagittaria isoetiformis</i> *	quillwort arrowhead	/SR	Not known on site	None known	Known in Brunswick County; limesink and beaver ponds, clay-based Carolina bays, natural lakes
<i>Schwalbea americana</i>	American chaffseed	E/E	Not known on site	None known	Not know in Brunswick County; habitat is moist to dry pinelands with frequent fires
<i>Scleria georgiana</i> *	Georgia-nutrush	/SR	Not known on site	None known	Known in Brunswick County; savannas
<i>Solidago pulchra</i>	Carolina goldenrod	SC/E	Not known on site	None known	Known in Brunswick County; savannas
<i>Solidago verna</i>	spring-flowering goldenrod	SC/E-PT	Not known on site	None known	Known in Brunswick County; habitat is mesic to moist pinelands and pocosin ecotones
<i>Sporobolus teretifolius</i>	wireleaf dropseed	FSC/T	Not known on site	None known	Known in only Brunswick and Columbus counties; habitat is wet savannas
<i>Sphagnum fitzgeraldii</i> *	Fitzgerald's peatmoss	/SR	Not known on site	None known	Known in Brunswick County; pocosins and savannas
<i>Stylisma pickeringii</i> (=Bonanmia)	Pickering's morning-glory (=dawnflower)	SC/E	Not known on site	None known	Unsuitable habitat; known in sandhills counties

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Thalictrum cooleyi</i>	Cooley's meadowrue	E/E	Known power line ROWs off-site	Species is managed under ROWs in agreement with the N.C. Natural Heritage Program	Habitat is wet savannas; facilities expansion or additional power lines would require assessments
<i>Tofieldia glabra</i>	smooth bog-asphodel (= Carolina asphodel)	SC/C	Not known on site	None known	Known in Brunswick County; habitat is savannas, moist sandhills, and pocosin ecotones
<i>Trichostema sp.1</i>	blue curls (=dune bluecurls), undescribed species	SC/C	Not known on site	None known	Known in Brunswick County; habitat is dunes, openings in maritime forest and scrub.
<i>Utricularia olivacea*</i>	dwarf bladderwort	/T	Not known on site	None known	Known in Brunswick County; limesink and beaver ponds
<i>Xyris brevifolia *</i>	shortleaf yellow-eyed grass	/SR	Not known on site	None known	Known in Brunswick County; savannas, other wet areas

Key:

C—Probable candidate for endangered or threatened status

C-PE—Candidate for proposed endangered status

C-PT—Candidate for proposed threatened status

C-SC—Candidate for Special Concern status

E—Endangered

E-PT—Currently endangered but a candidate for proposed threatened status

FSC—Federal Species of Concern

PC—Proposed candidate for listing status

SC—Special concern

SR—Significantly rare

T—Threatened

T(S/A)—Threatened due to Similarity of Appearance

W—State of N.C. "Watch" list

Species with no superscript designation are the species identified in the Pacific Northwest National Laboratory report for the NRC. A few species are dually listed on the PNNL report AND a state list; those are identified with an "N," meaning the PNNL report for the NRC.

Species noted with an asterisk (*) are listed by the State of N. C. Natural Heritage Program. No location data of these species is to be distributed to the general public (i.e., through newspapers, magazines, etc.) without the permission from the N. C. Natural Heritage Program of the North Carolina Department of Environment and Natural Resources. Species noted with a (+) are listed on the U. S. Fish and Wildlife Service, Region 4 endangered species list for North Carolina.

++CP&L resources for contact by plant personnel for updated information include personnel in the Environmental Services Section, Real Estate Management Section, and Transmission Department.

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CP&L

BSEP

MEMO

To: Mr. J. W. Johnson
Mr. J. C. Nuckles, Jr.
Mr. A. Eaddy

From: Cam Wheeler

Date: August 12, 1998

Subject: Threatened and Endangered Species
Self-Assessment Report

As earlier requested, attached are self assessment reports for compliance with threatened and endangered species at the three CP&L nuclear facilities. These assessments are in response to the NRC-issued report entitled "Threatened and Endangered Species for 75 Licensed Commercial Nuclear Power Generating Plants" (March 1997). The assessments have been prepared by the Biological Assessment Unit of the Environmental Services Section.

If there are questions, please let me know at Caronet 772-3288.



CCW/bjw

cc: Mr. G. B. Baird
Ms L. Cooper
Mr. W. R. Garrett
Mr. M. R. Greeson
Mr. R. S. Hobbs
Mr. K. T. Kirkland

Mr. T. E. Thompson
Mr. R. T. Wilson
Mr. R. C. Yates

Self Assessment of Carolina Power & Light Company's
Harris Nuclear Plant for Compliance with
Threatened and Endangered Species
August 12, 1998

In March 1997, the Ecology Group of Pacific Northwest National Laboratory (PNNL) issued a report to the U.S. Nuclear Regulatory Commission entitled "Threatened and Endangered Species Evaluation for 75 Licensed Nuclear Power Generating Plants" (PNNL-11524). The purpose of the report was to evaluate the Nuclear Regulatory Commission's licensing of commercial nuclear generating facilities to determine compliance with the Endangered Species Act of 1973 (ESA). Such an evaluation was necessary because the ESA requires that federal agencies ensure that actions by one another do not jeopardize the species protected under the ESA.

The PNNL report included the Harris Nuclear Plant and listed threatened and endangered species that might be impacted by plant activities. The PNNL assigned low, medium, or high priority for follow up regarding the potential for impacts to species at the nuclear facilities. Those facilities with a high-priority ranking were deemed, according to the PNNL report, in need of detailed follow-up evaluations before full ESA compliance can be assured. The Harris was given High Priority for the Cape Fear shiner (a fish), the red-cockaded woodpecker, rare plants, etc.

The purpose of this CP&L self assessment is to evaluate the PNNL report to determine what activities by Harris plant personnel need to be considered for compliance with the ESA for any species actually or likely occurring on Company property at the site. Transmission rights-of-way were assessed only to the Company property boundary. Beyond the property boundary, CP&L has easements on power line corridors on land that is privately owned. However, any known locations on power line corridors in North Carolina of rare, threatened, or endangered species are protected by management agreement with the North Carolina Natural Heritage Program.

This self assessment was carried out by considering the species identified in the PNNL report, assessing the potential for their actual occurrence at the site, and what activities, if any, need to be considered to prevent such species impact. The CP&L self assessment compared the list of potential species from the PNNL report to the current federally protected species and any considered state threatened, endangered, and special concern species as listed by the North Carolina Natural Heritage Program.

The results of the self assessment for the Harris Nuclear Plant are shown in Table 1. This table lists the species of animals and plants identified in the PNNL report, the current U.S. Fish & Wildlife Service list of protected species for North Carolina, and the species from the natural heritage program for North Carolina. The latter state list identifies species at the county level in which the nuclear facility is located. The status of each species (e.g., whether endangered, threatened, etc.) at the federal or state level is also identified in Table 1 showing their known

occurrence in proximity to the nuclear plants (in some cases adjacent counties), and actions, if any, required to avoid impact to these species.

An evaluation was made of the species that reasonably could be impacted by plant activities. The results of the evaluation are provided in Exhibit 1. Recommended actions required of CP&L are also suggested.

A proposed modification addition to the Environmental Self-Assessment Program "Other Items" Compliance Checklist is included as Exhibit 2 as a means of continuing this assessment on an on-going basis.

Included as Exhibit 3 is the current federally listed plants and animals for North Carolina.

Attached as Exhibit 4 is a Literature Review and Sources Used for this self assessment.

Summary:

The report issued by the PNNL included species of plants and animals that were in part extracted from state natural heritage program lists, and were thus not federally endangered or threatened. For this reason, this CP&L self assessment was expanded to include reviews of currently listed endangered, threatened, special concern species, as well as other species designations made by heritage program staff of North Carolina. While this state list does not carry the same regulatory status as the federal U.S. Fish & Wildlife Service list, it is included in this self assessment to more accurately assess the species of concern. The state listed species have the potential for future federal listing and, hence, they are "candidate species."

The self-assessment evaluation of the Harris Nuclear Plant shows there is one federally protected species that could be impacted by plant operations, facility expansion, or other activities.

Ongoing communication, regarding activities that potentially could affect threatened and endangered species, is recommended between plant personnel and personnel in CP&L's Environmental Service Section, Real Estate Management Section, and the Transmission Department.

**Exhibit 1. Federally Protected Species at or near CP&L's Harris Nuclear Plant
Requiring Action to Prevent Impact to Species**

Species	Recommendations for Reducing Impact to Listed Species*
Red-cockaded woodpecker	Facility expansion or construction requiring removal of pine trees requires assessment for occurrence on site of this species.

***Note: CP&L resources for consultation include personnel in the Environmental Service Section, Real Estate Management Section, and the Transmission Department.**

Under the Endangered Species Act, a Section 7 Consultation among federal agencies is required if a listed species is being impacted. One avenue for resolution includes an incidental take statement.

Exhibit 2

ENVIRONMENTAL SELF-ASSESSMENT PROGRAM

OTHER ITEMS

COMPLIANCE CHECKLIST

Completed by _____

Date _____

ENDANGERED SPECIES

1. Has the Environmental Services Section identified any new endangered or threatened species which may be potentially impacted by plant operations, maintenance, or facility expansion?
(Contact Environmental Services Section for update.)

YES () NO ()

Comments:

If yes, describe:

2. Are any endangered or threatened species or endangered or threatened species habitats being impacted by operation (other than those addressed by existing Biological Opinions), by planned maintenance, or future modification or expansion of the nuclear facility?
(Consult Environmental Services Section, Real Estate Management Section, and Transmission Department.)

YES () NO ()

Comments:

If yes, describe:

3. If the answer to number 2 above is "yes," what actions have been taken by the nuclear plant personnel to eliminate impacts to endangered or threatened species, which are occurring on plant property?

Comments:

Describe actions taken:

(For example, did you alter plans after contacting personnel in CP&L's Environmental Services Section, Real Estate Management Section, and the Transmission Department?)

Exhibit 3. U.S. Fish & Wildlife Service List of Endangered and Threatened Species in North Carolina.

North Carolina--53 species

Animals--27 species

- E - Bat, Indiana (*Myotis sodalis*)
- E - Bat, Virginia big-eared (*Plecotus townsendii virginianus*)
- E - Butterfly, Saint Francis' satyr (*Neonympha mitchellii francisci*)
- T - Chub, spotfin (=turquoise shiner) (*Cyprinella (=Hybopsis) monacha*)
- T - Eagle, bald (*Haliaeetus leucocephalus*)
- E - Elktoe, Appalachian (*Alasmidonta raveneliana*)
- E - Falcon, American peregrine (*Falco peregrinus anatum*)
- E - Heelsplitter, Carolina (*Lasmigona decorata*)
- E - Manatee, West Indian (=Florida) (*Trichechus manatus*)
- E - Mussel, dwarf wedge (*Alasmidonta heterodon*)
- E - Pearlymussel, little-wing (*Pegias fabula*)
- E - Plover, piping (*Charadrius melodus*)
- E - Shiner, Cape Fear (*Notropis mekistocholas*)
- T - Shrew, Dismal Swamp southeastern (*Sorex longirostris fisheri*)
- T - Silverside, Waccamaw (*Menidia extensa*)
- T - Snail, noonday (*Mesodon clarki nantahala*)
- E - Spider, spruce-fir moss (*Microhexura montivaga*)
- E - Spiny mussel, Tar River (*Elliptio steinstansana*)
- E - Squirrel, Carolina northern flying (*Glaucomys sabrinus coloratus*)
- E - Tern, roseate (*Sterna dougallii dougallii*)
- E - Turtle, Kemp's (=Atlantic) ridley sea (*Lepidochelys kempii*)
- T - Turtle, green sea (*Chelonia mydas*)
- E - Turtle, hawksbill sea (*Eretmochelys imbricata*)
- E - Turtle, leatherback sea (*Dermochelys coriacea*)
- T - Turtle, loggerhead sea (*Caretta caretta*)
- E - Wolf, red (*Canis rufus*)
- E - Woodpecker, red-cockaded (*Picoides borealis*)

Plants--26 species

- E - American chaffseed (*Schwalbea americana*)
- T - Blue Ridge goldenrod (*Solidago spithamea*)
- E - Bunched arrowhead (*Sagittaria fasciculata*)
- E - Canby's dropwort (*Oxypolis canbyi*)
- E - Cooley's meadowrue (*Thalictrum cooleyi*)
- T - Dwarf-flowered heartleaf (*Hexastylis naniflora*)
- E - Green pitcher-plant (*Sarracenia oreophila*)
- E - Harperella (*Ptilimnium nodosum (=fluviatile)*)
- T - Heller's blazingstar (*Liatris helleri*)

- E - Michaux's sumac (*Rhus michauxii*)
- T - Mountain golden heather (*Hudsonia montana*)
- E - Mountain sweet pitcher-plant (*Sarracenia rubra* ssp. *jonesii*)
- E - Pondberry (*Lindera melissifolia*)
- E - Roan Mountain bluet (*Hedyotis purpurea* var. *montana*)
- E - Rock gnome lichen (*Gymnoderma lineare*)
- E - Rough-leaved loosestrife (*Lysimachia asperulaefolia*)
- E - Schweinitz's sunflower (*Helianthus schweinitzii*)
- T - Seabeach amaranth (*Amaranthus pumilus*)
- T - Sensitive joint-vetch (*Aeschynomene virginica*)
- T - Small whorled pogonia (*Isotria medeoloides*)
- E - Small-anthered bittercress (*Cardamine micranthera*)
- E - Smooth coneflower (*Echinacea laevigata*)
- E - Spreading avens (*Geum radiatum*)
- T - Swamp pink (*Helonias bullata*)
- T - Virginia spiraea (*Spiraea virginiana*)
- E - White irisette (*Sisyrinchium dichotomum*)

Code:

E = Endangered

T = Threatened

Exhibit 4. Literature Review and Sources Used for Self Assessment.

- Amoroso, Jame L. 1997. Natural Heritage Program List of the Rare Plant Species of North Carolina. N.C. Department of Environment, Health and Natural Resources, Raleigh, N.C.
- Amoroso, Jame L. N.C. Department of Environment, Health and Natural Resources, Raleigh, N.C. Personal Communications. June 16, 1998, with Richard C. Yates (CP&L).
- LeGrand, Harry E. N.C. Department of Environment, Health and Natural Resources, Raleigh, N.C. Personal Communications. June 16, 1998, with Richard C. Yates (CP&L).
- LeBlond, Richard J. 1995. Inventory of the Natural Areas and Rare Species of Brunswick County North Carolina. N.C. Department of Environment, Health and Natural Resources, Raleigh.
- LeGrand, Harry E., and Stephen P. Hall. 1997. Natural Heritage Program List of the Rare Animal Species of North Carolina. N.C. Department of Environment, Health and Natural Resources, Raleigh.
- North Carolina Natural Heritage Program. 1995. Natural Heritage Areas Priority List. N.C. Department of Environment, Health and Natural Resources, Raleigh.
- North Carolina Natural Heritage Program. 1997. County Species List. N.C. Department of Environment, Health and Natural Resources, Raleigh.
- Sackschewsky, M. R. 1997. Threatened and Endangered Species Evaluation for 75 Licensed Commercial Nuclear Power Generating Plants. Pacific Northwest National Laboratory, Richland, WA.
- United States Fish & Wildlife Service. 1998. Endangered Species Home Page [Internet Site]. <http://www.fws.gov/r9endspp/endspp.html>

8/12/98

Table 1. Evaluation of Threatened and Endangered Species Reported at Carolina Power and Light Company's Harris Nuclear Plant.

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
Birds					
<i>Aimophila aestivalis</i>	Bachman's sparrow	SC/SC	Recorded near the confluence of Buckhorn Creek and the Cape Fear River.	None known	Open long-leaf pine forest, open fields
<i>Haliaeetus leucocephalus</i>	bald eagle	T/E	Occasional siting around the lake. No known nesting.	None known	Mature forest near large bodies of water
<i>Lanius ludovicianus</i>	loggerhead shrike	/SC	Not known on site	None known	Fields and pastures
<i>Picoides borealis</i>	red-cockaded woodpecker	E/E	Historically known near plant site	None known	Facility expansion involving removal of large pine trees need to be assessed for its occurrence
<i>Vermivora bachmanii</i>	Bachman's warbler	E/E	Not known on site	None known	Incidental visits to piedmont. Densely wooded swamps and thickets in S.C., Ala, Ark, and Mi.
Clams/Mollusks/ Bivalves					
<i>Alasmidonta heterodon</i>	dwarf wedge mussel	E/E	Not known on site	None known	Found in Tar and Neuse River drainages near Fall Line
<i>Alasmidonta varicosa</i>	brook floater	SC/T	Not known on site	None known	Found in Piedmont systems and along Blue Ridge Escarpment of Catawba River system
<i>Elliptio judithae</i> (included as a taxon within <i>E. roanokensis</i>)	Neuse slabshell (= Roanoke slabshell)	/T	Not known	None known	Cape Fear north to the Roanoke river systems
<i>Elliptio lanceolata</i>	yellow lance	FSC/T	Not known on site	None known	Found in Tar and Neuse River drainages near Fall Line

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Elliptio steinstansana</i>	Tar spiny mussel= Tar River spiny mussel	E/E	Not known on site	None known	Found in Tar River drainage (Swift Creek)
<i>Fusconaia masoni</i>	Atlantic pigtoe	FSC/T	Not known on site	None known	In lower Piedmont and Coastal Plain, including Black River
<i>Lampsilis cariosa</i>	Yellow lampmussel	FSC/T	Not known on site	None known	A number of river systems; mainly near the Fall Line
<i>Lasmigona subviridis</i>	Green floater	FSC/E	Not known on site	None known	Known in Cape Fear River system
<i>Strophitus undulatus*</i>	Squawfoot	/T	Recorded in Buckhorn Crk. Downstream of Harris Lake	None known	Found in the Tar, Neuse, Cape Fear, and Pee Dee river systems
Fishes					
<i>Acipenser brevirostrum</i>	shortnose sturgeon	E/E	Known from Pee Dee and Cape Fear rivers	No impact	Remains in the lower Cape Fear near the head of the Estuary just north of Wilmington. Nine have been collected near Wilmington since 1987.
<i>Maxostoma robustum</i>	robust redhorse	FSC/SC	Known in Pee Dee River drainage	No impact	Not known in Cape Fear drainage
<i>Notropis mekistocholas</i>	Cape Fear shiner	E/E	Known in nearby river systems	No impact	Restricted to the Cape Fear River system near the fall line. Nearest recorded specimen was from Parker's Creek near Cokesbury, NC.
<i>Noturus insignis (new subspecies)</i>	spotted (marginated) madtom	FSC/SR	Known from Dan River basin	No impact	
<i>Noturus sp. * (new species)</i>	broadtail madtom	/SC	Not known on site	None known	Cape Fear, Waccamaw, and Lumber drainages
Amphibians					
<i>Hemidactylium scutatum*</i>	four-toed salamander	/SC	Nearest specimens were recorded from the intersection of Utley Branch and the headwaters of White	No impact	Distribution spotty with disjunct populations in many states. Associated with sphagnum and boggy woodland ponds.

Class/Species	Common Name	Status Fed/State	Location	Impact++	Comments
			Oak Creek. Specimens also recorded near the confluence of Buck Horn Creek and the Cape Fear River.		
Insects					
<i>Gomphus septima</i>	Septima's clubtail	FSC/SR	Not known on site	No impact	
<i>Speyeria diana</i>	Diana fritillary	FSC/SR	Currently known only in N.C. mountains	No impact	Mountains, piedmont; rich woods and adjacent edges, host plant violets; believed extirpated from the lower piedmont
<i>Lithophane lemmeri*</i>	Lemmer's pinion	/SR	Recorded near the intersection of the Harris Plant access road and S.R. 1127.	No impact	Cedar glades and Atlantic White Cedar forest in the coastal plain.
Mammals					
<i>Canis rufus</i>	red wolf	E/E	Not known on site	None known	mountains, coastal plains; extensive forest, swamps, pocosins;
<i>Felis concolor cougar</i>	eastern cougar	E/E	Not known on site	None known	Extensive forest in remote areas
<i>Myotis austroriparius</i>	Southeastern myotis	FC/SC	Not known on site	None known	Coastal plains, piedmont; roost and buildings, hollow trees
<i>Neotoma floridana haematorea</i>	Southern Appalachian eastern woodrat	FSC/SC	Not known on site	None known	Mountains, piedmont; rocky areas in deciduous, mixed forest
Plants					
<i>Amorpha georgiana</i> var. <i>georgiana</i>	Georgia lead-plant (= indigo plant)	SC/E	Unsuitable habitat at Harris	No impact	Nearest known populations are in Bladen County and other eastern counties; it is a wet savanna species

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Astragalus michauxii</i>	sandhills milk-vetch	SC/C-PT	Unsuitable habitat at Harris	No impact	Nearest known populations are in Moore County; it is a sandhills species
<i>Echinacea laevigata</i>	smooth coneflower	E/E-SC	Not known on site	None known	Probable habitat; nearby populations are in Orange and Durham counties
<i>Eupatorium resinsum</i>	pine-barrens boneset (= resinous boneset)	SC/T-SC	Not known on site	None known	Nearby populations are known in Harnett and Hoke counties; preferred habitat is seepage bogs, beaver ponds, & shores
<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E/E	Not known on site	None known	Nearest known populations are in the western Piedmont in Randolph County
<i>Hexastylis lewisii*</i>	Lewis's heartleaf	/SR	Species recorded near the intersection of the Harris Plant access road and S.R. 1127.	None known	forest and pocosin edges
<i>Isoetes virginica</i>	Virginia quillwort	SC/C	Not know on site	None known	Nearby populations in Chatham County; possible habitat on site: upland wet depressions with clayey soils
<i>Lilium iridollae</i>	panhandle lily (= Sandhills bog lily)	SC/C-PT	Unsuitable habitat at Harris	No impact	Nearby populations in Moore County under CP&L power lines; very rare. Probable reclassification as a new species.
<i>Lindera melissifolia</i>	pondberry (= Southern spicebush)	E/E	Unsuitable habitat at Harris	No impact	Nearest populations in Bladen and Cumberland counties; preferred habitat is Carolina bays
<i>Lindera subcoriacea</i>	bog spicebush	FSC/E	Unsuitable habitat at Harris	No impact	Nearest populations are in Hoke and Lee counties
<i>Lysimachia asperulaefolia</i>	rough-leaved loosestrife	E/E	Not known on site.	None known.	Nearest populations in Harnett and Hoke counties; habitat preference is pocosin/savanna ecotones
<i>Monotropsis odorata</i>	sweet pinesap	SC/C	Not known on site;	None known	Preferred habitat is dry forests

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Oxypolis canbyi</i>	Canby's cowbane	E/E	suitable habitat probably exists Not known on site	None known	and bluffs; populations are known in Wake County. Nearest population is in Scotland County
<i>Oxypolis ternata</i>	Piedmont cowbane	FSC/W	Not known on site	None known	Nearest population is Harnett and Hoke counties; pine savanna sandhill seeps
<i>Parnassia caroliniana</i>	Carolina grass-of-parnassus	SC/E	Not known on site; unsuitable habitat	No impact	Nearest population is in Harnett County; prefers wet savannas and sandhill seeps
<i>Parthenium radfordii</i>	waveleaf wild-quinine	FSC/W	Not known on site	None known	Nearest population is Harnett and Hoke counties; clay soils in sandhills
<i>Phacelia covillei*</i>	Buttercup phacelia	/C	located near the confluence of Buckhorn Ck. And the Cape Fear River	No impact	Nearby populations occur in Chatham and Harnett counties, found in bottomlands and rich lower slopes
<i>Ptilimnium nodosum</i>	Harperella	E/E	Not known on site; suitable habitat probably exists	None known	Nearby populations occur in Chatham County; preferred habitat is rocky river beds
<i>Pyxidanthera barbulata brevifolia</i>	Well's pixie-moss (= Sandhills pixie-moss)	E/SC	Not known on site; unsuitable habitat	None known	Nearby populations in Harnett, Moore, & Hoke; preferred habitat is sandhills
<i>Rhus michauxii</i>	Michaux's sumac	E/E-SC	Not known on site.	None known	Nearest population is on southern loop of Raleigh belt line—some 20 miles away from Harris lands.
<i>Rudbeckia heliopsidis</i>	blackeyed Susan (= sunfacing coneflower)	SC/E	Not known on site	None known	Nearby populations in Harnett & Moore
<i>Schwalbea americana</i>	American chaffseed	E/E	Not known on site; not suitable habitat	None known	Nearby populations in Cumberland, Hoke & Moore; prefers fire-maintained savannas
<i>Solidago verna</i>	spring-flowering goldenrod	SC/E-PT	Not known on site; possible suitable habitat on site	None known	Nearest populations in Harnett County; prefers mesic to moist pine lands/pocosin ecotones

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Stylisma pickeringii</i> var. <i>pickeringii</i>	Pickering's dawn flower	SC/E	Not known on site; not suitable habitat	None known	Nearest population is in Moore County; prefers sandhills habitat
<i>Tofieldia glabra</i>	smooth bog-asphodel	SC/C	Not known on site; unsuitable habitat	None known	Nearest population is in Harnett & Moore; prefers savannas and sandhill seeps
<i>Trillium pusillum</i> <i>pusillum</i>	Carolina least trillium	SC/E	Not known on site; possible suitable habitat	None known	Nearby populations in Wake County; prefers nonriverine wet hardwoods and savanna ecotones
<i>Xyris scabrifolia</i>	roughleaf yellow-eyed grass	SC/C	Not known on site; unsuitable habitat	None known	Nearest populations in Harnett & Hoke; prefers sandhill seeps and bogs

Key:

- C—Probable candidate for Endangered or Threatened Status
- CPT—Candidate for proposed threatened status
- E—Endangered
- E-PT—Currently endangered but a candidate for proposed threatened status
- FSC—Federal species of concern
- SC—Special concern
- SR—Significantly rare
- T—Threatened
- T(S/A)—Threatened by Similarity of Appearance
- W—Watch list for proposed classification

Species with no superscript designation are the species identified in the Pacific Northwest National Laboratory report for the NRC. A few species are dually listed on the PNNL report AND a state list; those are identified with an "N."

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++CP&L resources for contact by plant personnel for updated information include personnel in the Environmental Services Section, Real Estate Management Section, and Transmission Department.

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Self Assessment of Carolina Power & Light Company's
Robinson Steam Electric Plant for Compliance with
Threatened and Endangered Species
August 12, 1998

In March 1997, the Ecology Group of Pacific Northwest National Laboratory (PNNL) issued a report to the U.S. Nuclear Regulatory Commission entitled "Threatened and Endangered Species Evaluation for 75 Licensed Nuclear Power Generating Plants" (PNNL-11524). The purpose of the report was to evaluate the Nuclear Regulatory Commission's licensing of commercial nuclear generating facilities to determine compliance with the Endangered Species Act of 1973 (ESA). Such an evaluation was necessary because the ESA requires that federal agencies ensure that actions by one another do not jeopardize the species protected under the ESA.

The PNNL report included the Robinson Steam Electric Plant and listed threatened and endangered species that might be impacted by plant activities. The PNNL assigned low, medium, or high priority for follow up regarding the potential for impacts to species at the nuclear facilities. Those facilities with a high-priority ranking were deemed, according to the PNNL report, in need of detailed follow-up evaluations before full ESA compliance can be assured. The Robinson facility was given Moderate-to-High Priority for the occurrence of the red-cockaded woodpecker and other species.

The purpose of this CP&L self assessment is to evaluate the PNNL report to determine what activities by Robinson plant personnel need to be considered for compliance with the ESA for any species actually or likely occurring on Company property at the site. Transmission rights-of-way were assessed only to the Company property boundary. Beyond the property boundary, CP&L has easements on power line corridors on land that is privately owned.

This self assessment was carried out by considering the species identified in the PNNL report, assessing the potential for their actual occurrence at the site, and what activities, if any, need to be considered to prevent such species impact. The CP&L self assessment compared the list of potential species from the PNNL report to the current federally protected species and any considered state threatened, endangered, and special concern species as listed by the South Carolina Heritage Trust Program.

The results of the self assessment for the Robinson Steam Electric Plant are shown in Table 1. This table lists the species of animals and plants identified in the PNNL report, the current U.S. Fish & Wildlife Service list of protected species for South Carolina. The latter state list identifies species at the county level in which the nuclear facility is located. The status of each species (e.g., whether endangered, threatened, etc.) at the federal or state level is also identified in Table 1 showing their known occurrence in proximity to the nuclear plants (in some cases adjacent counties), and actions, if any, required to avoid impact to these species.

An evaluation was made of the species that reasonably could be impacted by plant activities. The results of the evaluation are provided in Exhibit 1. Recommended actions required of CP&L are also suggested.

A proposed modification addition to the Environmental Self-Assessment Program "Other Items" Compliance Checklist is included as Exhibit 2 as a means of continuing this assessment on an on-going basis.

Included as Exhibit 3 is the current federally listed plants and animals for South Carolina.

Attached as Exhibit 4 is a Literature Review and Sources Used for this self assessment.

Summary:

The report issued by the PNNL included species of plants and animals that were in part extracted from state heritage trust program lists, and were thus not federally endangered or threatened. For this reason, this CP&L self assessment was expanded to include reviews of currently listed endangered, threatened, special concern species, as well as other species designations made by the S. C. Heritage Trust program staff of South Carolina. While this state list does not carry the same regulatory status as the federal U.S. Fish & Wildlife Service list, it is included in this self assessment to more accurately assess the species of concern. The state listed species have the potential for future federal listing and, hence, they are "candidate species."

The self-assessment evaluation of the Robinson Steam Electric Plant shows there is one federally protected species that could be impacted by plant operations, facility expansion, or other activities.

Ongoing communication, regarding activities that potentially could affect threatened and endangered species, is recommended between plant personnel and personnel in CP&L's Environmental Service Section, Real Estate Management Section, and the Transmission Department.

**Exhibit 1. Federally Protected Species at or near CP&L's Robinson Steam Electric Plant
Requiring Action to Prevent Impact to Species**

Species	Recommendations for Reducing Impact to Listed Species*
Red-cockaded woodpecker	Facility expansion or construction requiring removal of pine trees requires on-site assessment for occurrence.

***Note: CP&L resources for consultation include personnel in the Environmental Service Section, Real Estate Management Section, and the Transmission Department.**

Under the Endangered Species Act, a Section 7 Consultation among federal agencies is required if a listed species is being impacted. One avenue for resolution includes an incidental take statement.

Exhibit 2

ENVIRONMENTAL SELF-ASSESSMENT PROGRAM

OTHER ITEMS

COMPLIANCE CHECKLIST

Completed by _____

Date _____

ENDANGERED SPECIES

1. Has the Environmental Services Section identified any new endangered or threatened species which may be potentially impacted by plant operations, maintenance, or facility expansion?
(Contact Environmental Services Section for update.)

YES () NO ()

Comments:

If yes, describe:

2. Are any endangered or threatened species or endangered or threatened species habitats being impacted by operation (other than those addressed by existing Biological Opinions), by planned maintenance, or future modification or expansion of the nuclear facility?
(Consult Environmental Services Section, Real Estate Management Section, and Transmission Department.)

YES () NO ()

Comments:

If yes, describe:

3. If the answer to number 2 above is "yes," what actions have been taken by the nuclear plant personnel to eliminate impacts to endangered or threatened species, which are occurring on plant property?

Comments:

Describe actions taken:

(For example, did you alter plans after contacting personnel in CP&L's Environmental Services Section, Real Estate Management Section, and Transmission Department?)

Exhibit 3. U.S. Fish & Wildlife Service List of Endangered and Threatened Species in South Carolina.

South Carolina--34 species

Animals--15 species

- E - Bat, Indiana (*Myotis sodalis*)
- T - Eagle, bald (*Haliaeetus leucocephalus*)
- E - Falcon, American peregrine (*Falco peregrinus anatum*)
- E - Heelsplitter, Carolina (*Lasmigona decorata*)
- E - Manatee, West Indian (=Florida) (*Trichechus manatus*)
- E - Plover, piping (*Charadrius melodus*)
- T - Snake, eastern indigo (*Drymarchon corais couperi*)
- E - Stork, wood (*Mycteria americana*)
- E - Tern, roseate (*Sterna dougallii dougallii*)
- E - Turtle, Kemp's (=Atlantic) ridley sea (*Lepidochelys kempii*)
- T - Turtle, green sea (*Chelonia mydas*)
- E - Turtle, hawksbill sea (*Eretmochelys imbricata*)
- E - Turtle, leatherback sea (*Dermochelys coriacea*)
- T - Turtle, loggerhead sea (*Caretta caretta*)
- E - Woodpecker, red-cockaded (*Picoides borealis*)

Plants--19 species

- E - American chaffseed (*Schwalbea americana*)
- E - Black-spored quillwort (*Isoetes melanospora*)
- E - Bunched arrowhead (*Sagittaria fasciculata*)
- E - Canby's dropwort (*Oxypolis canbyi*)
- T - Dwarf-flowered heartleaf (*Hexastylis naniflora*)
- E - Harperella (*Ptilimnium nodosum* (=fluviatile))
- T - Little amphianthus (*Amphianthus pusillus*)
- T - Miccosukee gooseberry (*Ribes echinellum*)
- E - Michaux's sumac (*Rhus michauxii*)
- E - Mountain sweet pitcher-plant (*Sarracenia rubra* ssp. *jonesii*)
- E - Persistent trillium (*Trillium persistens*)
- E - Pondberry (*Lindera melissifolia*)
- E - Relict trillium (*Trillium reliquum*)
- E - Rough-leaved loosestrife (*Lysimachia asperulaefolia*)
- E - Schweinitz's sunflower (*Helianthus schweinitzii*)
- T - Seabeach amaranth (*Amaranthus pumilus*)
- T - Small whorled pogonia (*Isotria medeoloides*)
- E - Smooth coneflower (*Echinacea laevigata*)
- T - Swamp pink (*Helonias bullata*)

Code:

E = Endangered

T = Threatened

Exhibit 4. Literature Review and Sources Used for Self Assessment.

Sackschewsky, M. R. 1997. Threatened and Endangered Species Evaluation for 75 Licensed Commercial Nuclear Power Generating Plants. Pacific Northwest National Laboratory, Richland, WA.

South Carolina Heritage Trust. [1998]. Distributions of Threatened and Endangered Species in South Carolina. S. C. Department of Natural Resources, Columbia, S.C.

Taylor, Michelle. South Carolina Heritage Trust, Columbia, S.C. Personal Communications. January 29 and April 20, 1998, with Bobby J. Ward (CP&L).

Taylor, Michelle. South Carolina Heritage Trust, Columbia, S.C. Personal Communications. June 19, 1998, with Richard C. Yates (CP&L).

United States Fish & Wildlife Service. 1998. Endangered Species Home Page [Internet Site]. <http://www.fws.gov/r9endspp/endspp.html>

8/12/98

Table 1. Evaluation of Threatened and Endangered Species Reported at Carolina Power and Light Company's H. B. Robinson Steam Electric Plant.

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
Birds					
<i>Charadrius melodus</i>	piping plover	FT/	Not known on site	None known	Ocean beaches and island-end flats
<i>Falco peregrinus</i>	peregrine falcon	FE/	Not known on site	None known	Mountain cliffs and tidewater coastal ponds and sounds
<i>Haliaeetus leucocephalus</i>	bald eagle	FT/SE	Infrequent visitor around the lake; no known nesting	None known	Mature forests near large bodies of water; lakes and sounds
<i>Lanius ludovicianus</i>	loggerhead shrike	/SC	Inhabits open land (e.g., ROWs/fields) in site area	None known	Coastal plain fields and pastures
<i>Mycteria americana</i>	wood stork	FE/	Not known on site	None known	Tidewater fresh or brackish ponds
<i>Picoides borealis</i>	red-cockaded woodpecker	FE/	Historically inhabited Darlington Co. CT lands	None known	Surveys will be required if there is timber harvest or construction and land clearing of mature longleaf pine trees; Chesterfield Co., Darlington Co.
<i>Limnothlypis swainsonii</i> *	Swainson's warbler	/SC	Seasonal resident; nests in Black Creek bottomland upstream of Robinson Impoundment	None known	Chesterfield Co.
Clams					
<i>Lasmigona decorata</i>	Carolina heelsplitter	FE			Chesterfield Co.
<i>Villosa constricta</i> *	notched rainbow bivalve	/SC	Not known on site	None known	Chesterfield Co.
Amphibians					
<i>Hyla andersonii</i> *	pine barrens treefrog	/ST	Not known on site	None known	Sandhills wetlands with open herbaceous/shrub bogs; occurs

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
					in Chesterfield Co.
Reptiles					
<i>Pituophis melanoleucus*</i>	pine or gopher snake	/SC	Not known on site	None known	Chesterfield Co.
<i>Caretta caretta</i>	loggerhead sea turtle	FT/	Not known on site	None known	Species is coastal and oceanic; nests on well-drained sites on sandy beaches
<i>Ophisaurus mimicus</i>	Mimic glass lizard	SC	Not known on site	None known	Pine flatwoods, savannas, and pine/oak sandhills
Fishes					
<i>Acipenser brevirostrum</i>	shortnose sturgeon	FE/	Not known on site	None known	Found in lower estuaries in winter and upstream as far as fall line in summer. Known in Pec Dee River
<i>Notropis mekistocholas</i>	Cape Fear shiner	FE/ #	Not known on site	None known	Known only from Cape Fear River drainage in N.C.
<i>Etheostoma flabellare*</i>	fantail darter	/SC	Not known on site	None known	Chesterfield Co.
<i>Notropis chiliticus*</i>	redlip shiner	/SC	Not known on site	None known	Chesterfield Co.
<i>Semotilus lumbee*</i>	sandhills chub	/ST	Not known on site	None known	Found in slow-flowing sandhill creeks with sand or gravel bottoms where vegetation is sparse; known in Chesterfield Co.
Mammals					
<i>Felis concolor cougar</i>	eastern cougar	FE/	Not known on site	None known	Extensive forests in remote areas
<i>Corynorhinus (=Plecotus) rafinesquii</i>	Rafinesque's big-eared bat	/SE	Not known on site	None known	Roosts in caves, rock houses, and various man-made shelters; known in Darlington Co.
<i>Condylura cristata*</i>	star-nosed mole	/SC	Known to inhabit Black Creek bottomland upstream of Robinson Impoundment	Not known	One record was found in stomach of largemouth bass collected by CP&L in Chesterfield Co.

Class/Species	Common Name	Status Fed/State	Location	Impact++	Comments
Plants					
<i>Amaranthus pumilus</i> +(N)	Seabeach amaranth	FT/	Not known on site	None known	Ocean beaches and island-end flats
<i>Amorpha georgiana georgiana</i> *	Georgia lead-plant (= savanna indigo bush)	FSC/SC	Not known on site	None known	Moist sandhills areas and sandy terraces; Darlington Co.
<i>Amphianthus pusillus</i>	little amphianthus	FT/	Not known on site	None known	Found on vernal pools on granite outcrops
<i>Arabis missouriensis</i> * (= <i>A. laevigata</i> var. <i>missouriensis</i>)*	Missouri rock-cress	/SC	Not known on site	None know	Thin soils around basic rock outcrops; Darlington Co.
<i>Aristolochia tomentosa</i> *	wooly dutchman's-pipe	/SC	Not known on site	None known	Known near Savannah River
<i>Asplenium bradleyi</i> *	Bradley's spleenwort	/RC	Not known on site	None known	Chesterfield Co.
<i>Aster georgianus</i>	Georgia aster	NC/SC	Not known on site	None known	Piedmont open roads and roadsides
<i>Astragalus michauxii</i>	sandhills milk-vetch	NC/SC	Not known on site	None known	Sandhills; Chesterfield Co., Darlington Co.
<i>Balduina atropurpurea</i> *(N)	purple balduina = honeycomb head	SC/SC	Not known on site	None known	Savannas; Darlington Co.; known in dense bottomland hardwood near Hartsville
<i>Balduina uniflora</i> *	one-flower baldunia	/SC	Not known on site	None known	Darlington Co.
<i>Burmannia biflora</i> *	northern burmannia	/SC	Not known on site	None known	Chesterfield Co. [Power line right of way]
<i>Calamovilfa brevipilis</i> *	pine-barrens reed-grass	/SC	Not known on site	None known	Chesterfield Co.; [Power line right of way]
<i>Calopogon barbatus</i> *	bearded grass-pink (orchid)	/SC	Not known on site	None known	Darlington Co.
<i>Carex collinsii</i> *	Collin's sedge	/SC	Not known on site	None known	Chesterfield Co., Darlington Co.
<i>Chrysoma pauciflosculosa</i> * (= <i>Solidago paucifolosculosa</i>)*	woody goldenrod	/SC	Not known on site	None known	Sandhills; Chesterfield Co.
<i>Circaea lutetiana ssp canadensis</i> *	enchanter's nightshade	/SC	Not known on site	None known	Darlington Co.
<i>Cladium mariscoides</i> *	twig rush	/SC	Not known on site	None known	Bogs, fens, brackish marshes and sandhill seepage bogs;

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Danthonia epilis</i> *	bog oat-grass	/SC	Not known on site	None known	Darlington Co.
<i>Draba reptans</i> *	Carolina whitlow-grass (=creeping draba)	/SC	Not known on site	None known	Seepage bogs; Chesterfield Co. Darlington Co.
<i>Dryopteris spinulosa</i> *	spinulose wood-fern	/SC	Not known on site	None known	Darlington Co.
<i>Echinacea laevigata</i>	smooth coneflower	FE/	Not known on site	None known	Glades, woodlands, and open areas over mafic rocks
<i>Eriocaulon texense</i> *	pipewort (=Texas hatpins)	/SC	Not known on site	None known	Sphagnum bogs; Chesterfield Co.
<i>Gentiana autumnalis</i> *	pine barren gentian	/SC	Not known on site	None known	Chesterfield Co.
<i>Helenium pinnatifidum</i> *	southeastern sneezeweed (dissected sneezeweed)	/SC	Not known on site	None known	Savannas and open, wet and mucky sites; Darlington Co.
<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	FE/	Not known on site	None known	Open woods and roadsides
<i>Hudsonia ericoides</i> *	Golden-heather	/RC	Not known on site	None known	Chesterfield Co.
<i>Ilex amelanchier</i> *	sarvis holly	/SC	Not known on site	None known	Blackwater swamps and riverbanks, and clay-based Carolina bays; Darlington Co.
<i>Isoetes melanospora</i>	black-spored quillwort	FE/	Not known on site	None known	Vernal pools on granite outcrops
<i>Isoetes virginica</i> *(N)	Quillwort	/SC	Not known on site	None known	Upland depression swamp forests and clayey soils; Darlington Co.
<i>Kalmia cuneata</i>	white-wicky	NC/	Not known on site	None known	Pocosins; Chesterfield Co., Darlington Co.
<i>Lepuropetalon spathulatum</i> *	southern lepuropetalon	/SC	Not known on site	None known	Darlington Co.
<i>Lindera melissifolia</i>	pondberry (=Southern spicebush)	FE/	Not known on site	None known	Carolina bays, upland depressions, and other wet areas
<i>Lygodium palmatum</i> *	climbing fern	/SC	Not known on site	None known	Darlington Co.
<i>Lysimachia asperulaefolia</i>	rough-leaved loosestrife	FE/	Not known on site	None known	Upland bogs with evergreen shrubs, pocosin and savanna ecotones; known in Darlington Co.
<i>Macbridea caroliniana</i>	Carolina birds-in-a-nest	FSC/	Not known on site	None known	Blackwater swamps, savanna/pocosin ecotones and ditches; Darlington Co.

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Menispermum canadense</i> *	Canada moonseed	/SC	Not known on site	None known	Darlington Co.
<i>Myriophyllum laxum</i> *	piedmont water-milfoil	/RC	Not known on site	None known	Limesink ponds, waters of natural lakes; Chesterfield Co.
<i>Nestronia umbellula</i> *	nestronia	/SC	Not know on site	None known	Upland forests; Chesterfield Co.
<i>Ophioglossum vulgatum</i> *	adder's tongue	/SC	Not known on site	None known	Darlington Co.
<i>Oxypolis canbyi</i>	Canby's dropwort	FE/	Not known on site	None known	Clay-based Carolina bays and similar open wetlands
<i>Oxypolis ternata</i>	Piedmont cowbane	SC/	Not known on site	None known	Pine savannas and sandhill seeps
<i>Paspalum bifidum</i> *	beard-grass	/SC	Not known on site	None known	Chesterfield Co.; Sandhills State Forest
<i>Pleea tenuifolia</i> *	rush false-asphodel	/SC	Not known on site	None known	Darlington Co.
<i>Potamogeton confervoides</i> *	algae-like pondweed	/SC	Not known on site	None known	Beaver ponds and old millponds on blackwater creeks
<i>Psilotum nudum</i> *	whisk fern	/SC	Not known on site	None known	Acid swamps; Darlington Co.
<i>Pyxidantha barbulata barbulata</i> *	Well's pixie-moss	/SC	Not known on site	None known	Sandhills; Chesterfield Co.
<i>Pyxidantha barbulata</i> *	Flowering pixie moss	/NC	Not known on site	None known	Sandhills; Chesterfield Co., Darlington Co.
<i>Pyxidantha brevifolia</i> * (= <i>P. barbulata</i> var. <i>Brevifolia</i>)	Sandhills pixie moss	/NC	Not known on site	None known	Sandhills; Chesterfield Co.,
<i>Rhexia aristosa</i> *(N)	awned meadowbeauty	/SC	Not known on site	None known	Clay-based Carolina bays and limesink ponds; Darlington Co.
<i>Rhus michauxii</i>	Michaux's sumac	FE/	Not known on site	None known	Open uplands
<i>Rhynchospora alba</i> *	white beakrush (=Northern white beaksedge)	/SC	Not known on site	None known	Fens, bogs, pocosin openings, limesink ponds; Chesterfield Co.

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Rhynchospora stenophylla</i> *	Chapman beakrush	/SC	Not known on site	None known	Moist open areas; Chesterfield Co.
<i>Ruellia caroliniensis</i> ssp <i>ciliosa</i> *	wild "petunia"	/SC	Not known on site	None known	Darlington Co.
<i>Sarracenia rubra</i> *	sweet pitcher-plant	/SC	Collected East of Trans. D in 7/75 at HBR	None known	Chesterfield Co., Darlington Co.; a survey should be done at the location to determine current occurrence of the species to determine any action to be taken.
<i>Schwalbea americana</i>	American chaffseed	FE/	Not known on site	None known	Savannas and moist to dryish pinelands with frequent fire
<i>Scirpus etuberculatus</i> *	canby bulrush	/SC	Collected at Trans. G in 1975	To be determined	Chesterfield Co.
<i>Scirpus subterminalis</i> *	water bulrush	/SC	Not known on site	None known	Darlington Co.
<i>Scutellaria parvula</i> *	small skullcap	/SC	Not known on site	None known	Darlington Co.
<i>Sporobolus sp 1</i> *	Carolina dropseed	/SC	Not known on site	None known	Chesterfield Co.
<i>Sporobolus teretifolius</i>	wire-leaved dropseed	NC/	Not known on site	None known	Chesterfield Co.
<i>Solidago bicolor</i> *	white goldenrod	/SC	Not known on site	None known	Darlington Co.
<i>Solidago verna</i> *(N)	spring-flowering goldenrod	NC/	Not known on site	None known	Mesic to moist pinelands, pocosin ecotones; Chesterfield Co.
<i>Syngonanthus flavidulus</i> *	yellow pipewort	/SC	Not known on site	None known	Chesterfield Co.; ditches, pocosins ecotones, savannas.
<i>Thalictrum cooleyi</i>	Cooley's meadowrue	FE/ #	Not known on site	None known	Wet savannas
<i>Tofieldia glabra</i> *(N)	smooth bog-asphodel	/SC	Not known on site	None known	Savannas, sandhill seeps, moist sandhills/pocosin ecotones; Darlington Co.
<i>Tridens carolinianus</i> *	Carolina fluff-grass	/SC	Not known on site	None known	Sandhills and pine flatwoods;

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Utricularia olivacea</i> *	piedmont bladderwort	/SC	Not known on site	None known	Chesterfield Co. Limesink ponds & beaver ponds; Chesterfield Co.
<i>Xyris scabrifolia</i> *	Harper's yellow-eyed grass (=roughleaf yellow-eyed grass)	/SC	Not known on site	None known	Sandhill seeps and bogs; Chesterfield Co.

FSC—Federal species of concern

FE—Federal endangered

FT—Federal threatened

PFT—Proposed Federal threatened

CF—Candidate for review (Federal)

NC—Of concern, nationally (unofficial- plants only)

RC—Of concern, regionally (unofficial - plants only)

SE—State of S.C. endangered

ST—State of S.C. threatened

SC—Of concern (State of S.C.)

SX—State extirpated (no longer exists)

PE/PT/C—Proposed candidate for federal listing

T(S/A)—Threatened due to Similarity of Appearance

Species with no superscript designation are the species identified in the Pacific Northwest National Laboratory report for the NRC. A few species are dually listed on the PNNL report AND a state list; those are identified with an "N."

Species noted with an asterisk (*) are listed by the State of S.C. Heritage Trust Program. No location data of these species is to be distributed to the general public (i.e., through newspapers, magazines, etc.) without the permission from the S.C. Heritage Trust Program of the South Carolina Department of Natural Resources.

Indicates that the species is not tracked by the South Carolina Heritage Trust.

++CP&L resources for contact by plant personnel for updated information include personnel in the Environmental Services Section, Real Estate Management Section, and Transmission Department.

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CP&L

BSEP-00

MEMO

To: Mr. J. W. Johnson
 Mr. J. C. Nuckles, Jr.
 Mr. A. Eaddy

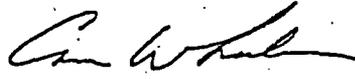
From: Cam Wheeler

Date: August 12, 1998

Subject: Threatened and Endangered Species
 Self-Assessment Report

As earlier requested, attached are self assessment reports for compliance with threatened and endangered species at the three CP&L nuclear facilities. These assessments are in response to the NRC-issued report entitled "Threatened and Endangered Species for 75 Licensed Commercial Nuclear Power Generating Plants" (March 1997). The assessments have been prepared by the Biological Assessment Unit of the Environmental Services Section.

If there are questions, please let me know at Caronet 772-3288.



CCW/bjw

cc: Mr. G. B. Baird
 Ms L. Cooper
 Mr. W. R. Garrett
 Mr. M. R. Greeson
 Mr. R. S. Hobbs
 Mr. K. T. Kirkland

 Mr. T. E. Thompson
 Mr. R. T. Wilson
 Mr. R. C. Yates

Self Assessment of Carolina Power & Light Company's
Brunswick Steam Electric Plant for Compliance with
Threatened and Endangered Species
August 12, 1998

In March 1997, the Ecology Group of Pacific Northwest National Laboratory (PNNL) issued a report to the U.S. Nuclear Regulatory Commission entitled "Threatened and Endangered Species Evaluation for 75 Licensed Nuclear Power Generating Plants" (PNNL-11524). The purpose of the report was to evaluate the Nuclear Regulatory Commission's licensing of commercial nuclear generating facilities to determine compliance with the Endangered Species Act of 1973 (ESA). Such an evaluation was necessary because the ESA requires that federal agencies ensure that actions by one another do not jeopardize the species protected under the ESA.

The PNNL report included the Brunswick Steam Electric Plant and listed threatened and endangered species that might be impacted by plant activities. The PNNL assigned low, medium, or high priority for follow up regarding the potential for impacts to species at the nuclear facilities. Those facilities with a high-priority ranking were deemed, according to the PNNL report, in need of detailed follow-up evaluations before full ESA compliance can be assured. The Brunswick was given High Priority for sea turtles, manatees, terrestrial species, and other aquatic species.

The purpose of this CP&L self assessment is to evaluate the PNNL report to determine what activities by Brunswick personnel need to be considered for compliance with the ESA for any species actually or likely occurring on Company property at the site. Transmission rights-of-way were assessed only to the Company property boundary. Beyond the property boundary, CP&L has easements on power line corridors on land that is privately owned. However, any known locations on power line corridors in North Carolina of rare, threatened, or endangered species are protected by management agreement with the North Carolina Natural Heritage Program. 2

This self assessment was carried out by considering the species identified in the PNNL report, assessing the potential for their actual occurrence at the site, and what activities, if any, need to be considered to prevent such species impact. The CP&L self assessment compared the list of potential species from the PNNL report to the current federally protected species and any considered state threatened, endangered, and special concern species as listed by the North Carolina Natural Heritage Program.

The results of the self assessment for the Brunswick Steam Electric Plant are shown in Table 1. This table lists the species of animals and plants identified in the PNNL report, the current U.S. Fish & Wildlife Service list of protected species for North Carolina, and the species from the natural heritage program for North Carolina. The latter state list identifies species at the county level in which the nuclear facility is located. The status of each species (e.g., whether endangered, threatened, etc.) at the federal or state level is also identified in Table 1 showing their

known occurrence in proximity to the nuclear plants (in some cases adjacent counties), and actions, if any, required to avoid impact to these species.

An evaluation was made of the species that reasonably could be impacted by plant activities. The results of the evaluation are provided in Exhibit 1. Recommended actions required of CP&L are also suggested.

A proposed modification addition to the Environmental Self-Assessment Program "Other Items" Compliance Checklist is included as Exhibit 2 as a means of continuing this assessment on an on-going basis.

Included as Exhibit 3 is the current federally listed plants and animals for North Carolina.

Attached as Exhibit 4 is a Literature Review and Sources Used for this self assessment.

Summary:

The report issued by the PNNL included species of plants and animals that were in part extracted from state natural heritage program lists, and were thus not federally endangered or threatened. For this reason, this CP&L self assessment was expanded to include reviews of currently listed endangered, threatened, special concern species, as well as other species designations made by heritage program staff of North Carolina. While this state list does not carry the same regulatory status as the federal U.S. Fish & Wildlife Service list, it is included in this self assessment to more accurately assess the species of concern. The state listed species have the potential for future federal listing and, hence, they are "candidate species." 3

The self-assessment evaluation of the Brunswick Steam Electric Plant shows there are six federally protected species that could be impacted by plant operations, facility expansion, or other activities. The results of the assessment show that the only known instances where nuclear plant operations are having an effect on a federally listed species are sea turtles at the Brunswick Steam Electric Plant. In that case, CP&L is currently cooperating with the Nuclear Regulatory Commission and the National Marine Fisheries under a Section 7 Consultation of the Endangered Species Act. Resolution is expected later in 1998.

Ongoing communication, regarding activities that potentially could affect threatened and endangered species, is recommended between plant personnel and personnel in CP&L's Environmental Service Section, Real Estate Management Section, and the Transmission Department.

Exhibit 1. Federally Protected Species at or near CP&L's Brunswick Steam Electric Plant Requiring Action to Prevent Impact to Species

<u>Species</u>	<u>Recommendations for Reducing Impact to Listed Species*</u>
Red-cockaded woodpecker	Facility expansion or construction requiring removal of pine trees requires on-site assessment for occurrence.
Loggerhead sea turtle	Potential for impingement; blocker panel maintenance; canal patrols
Green sea turtle	Potential for impingement; blocker panel maintenance; canal patrols
Kemp's Ridley sea turtle	Potential for impingement; blocker panel maintenance; canal patrols
Rough-leaved loosestrife (plant)	Population is known on ROW off site and is protected and managed by CP&L in agreement with N.C. Natural Heritage Program.
Cooley's meadowrue (plant)	Population is known on ROW off site and is protected and managed by CP&L in agreement with N.C. Natural Heritage Program.

*Note: CP&L resources for consultation include personnel in the Environmental Service Section, Real Estate Management Section, and the Transmission Department.

Under the Endangered Species Act, a Section 7 Consultation among federal agencies is required if a listed species is being impacted. One avenue for resolution includes an incidental take statement.

Exhibit 3. U.S. Fish & Wildlife Service List of Endangered and Threatened Species in North Carolina.

North Carolina--53 species

Animals--27 species

- E - Bat, Indiana (*Myotis sodalis*)
- E - Bat, Virginia big-eared (*Plecotus townsendii virginianus*)
- E - Butterfly, Saint Francis' satyr (*Neonympha mitchellii francisci*)
- T - Chub, spotfin (=turquoise shiner) (*Cyprinella* (=Hybopsis) *monacha*)
- T - Eagle, bald (*Haliaeetus leucocephalus*)
- E - Elktoe, Appalachian (*Alasmidonta raveneliana*)
- E - Falcon, American peregrine (*Falco peregrinus anatum*)
- E - Heelsplitter, Carolina (*Lasmigona decorata*)
- E - Manatee, West Indian (=Florida) (*Trichechus manatus*)
- E - Mussel, dwarf wedge (*Alasmidonta heterodon*)
- E - Pearlymussel, little-wing (*Pegias fabula*)
- E - Plover, piping (*Charadrius melodus*)
- E - Shiner, Cape Fear (*Notropis mekistocholas*)
- T - Shrew, Dismal Swamp southeastern (*Sorex longirostris fisheri*)
- T - Silverside, Waccamaw (*Menidia extensa*)
- T - Snail, noonday (*Mesodon clarki nantahala*)
- E - Spider, spruce-fir moss (*Microhexura montivaga*)
- E - Spiny mussel, Tar River (*Elliptio steinstansana*)
- E - Squirrel, Carolina northern flying (*Glaucomys sabrinus coloratus*)
- E - Tern, roseate (*Sterna dougallii dougallii*)
- E - Turtle, Kemp's (=Atlantic) ridley sea (*Lepidochelys kempii*)
- T - Turtle, green sea (*Chelonia mydas*)
- E - Turtle, hawksbill sea (*Eretmochelys imbricata*)
- E - Turtle, leatherback sea (*Dermochelys coriacea*)
- T - Turtle, loggerhead sea (*Caretta caretta*)
- E - Wolf, red (*Canis rufus*)
- E - Woodpecker, red-cockaded (*Picoides borealis*)

Plants--26 species

- E - American chaffseed (*Schwalbea americana*)
- T - Blue Ridge goldenrod (*Solidago spithamea*)
- E - Bunched arrowhead (*Sagittaria fasciculata*)
- E - Canby's dropwort (*Oxypolis canbyi*)
- E - Cooley's meadowrue (*Thalictrum cooleyi*)
- T - Dwarf-flowered heartleaf (*Hexastylis naniflora*)
- E - Green pitcher-plant (*Sarracenia oreophila*)
- E - Harperella (*Ptilimnium nodosum* (=fluviatile))
- T - Heller's blazingstar (*Liatris helleri*)

- E - Michaux's sumac (*Rhus michauxii*)
- T - Mountain golden heather (*Hudsonia montana*)
- E - Mountain sweet pitcher-plant (*Sarracenia rubra* ssp. *jonesii*)
- E - Pondberry (*Lindera melissifolia*)
- E - Roan Mountain bluet (*Hedyotis purpurea* var. *montana*)
- E - Rock gnome lichen (*Gymnoderma lineare*)
- E - Rough-leaved loosestrife (*Lysimachia asperulaefolia*)
- E - Schweinitz's sunflower (*Helianthus schweinitzii*)
- T - Seabeach amaranth (*Amaranthus pumilus*)
- T - Sensitive joint-vetch (*Aeschynomene virginica*)
- T - Small whorled pogonia (*Isotria medeoloides*)
- E - Small-anthered bittercress (*Cardamine micranthera*)
- E - Smooth coneflower (*Echinacea laevigata*)
- E - Spreading avens (*Geum radiatum*)
- T - Swamp pink (*Helonias bullata*)
- T - Virginia spiraea (*Spiraea virginiana*)
- E - White irisette (*Sisyrinchium dichotomum*)

Code:

E = Endangered

T = Threatened

Exhibit 4. Literature Review and Sources Used for Self Assessment.

- Amoroso, Jame L. 1997. Natural Heritage Program List of the Rare Plant Species of North Carolina. N.C. Department of Environment, Health and Natural Resources, Raleigh, N.C.
- Amoroso, Jame L. N.C. Department of Environment, Health and Natural Resources, Raleigh, N.C. Personal Communications. June 16, 1998, with Richard C. Yates (CP&L).
- LeGrand, Harry E. N.C. Department of Environment, Health and Natural Resources, Raleigh, N.C. Personal Communications. June 16, 1998, with Richard C. Yates (CP&L).
- LeBlond, Richard J. 1995. Inventory of the Natural Areas and Rare Species of Brunswick County North Carolina. N.C. Department of Environment, Health and Natural Resources, Raleigh.
- LeGrand, Harry E., and Stephen P. Hall. 1997. Natural Heritage Program List of the Rare Animal Species of North Carolina. N.C. Department of Environment, Health and Natural Resources, Raleigh.
- North Carolina Natural Heritage Program. 1995. Natural Heritage Areas Priority List. N.C. Department of Environment, Health and Natural Resources, Raleigh.
- North Carolina Natural Heritage Program. 1997. County Species List. N.C. Department of Environment, Health and Natural Resources, Raleigh. 7
- Sackschewsky, M. R. 1997. Threatened and Endangered Species Evaluation for 75 Licensed Commercial Nuclear Power Generating Plants. Pacific Northwest National Laboratory, Richland, WA.
- United States Fish & Wildlife Service. 1998. Endangered Species Home Page [Internet Site]. <http://www.fws.gov/r9endspp/endspp.html>

8/12/98

Table 1. Evaluation of Threatened and Endangered Species Reported at Carolina Power and Light Company's Brunswick Steam Electric Plant.

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
Birds <i>Aimophila aestivalis</i>	Bachman's sparrow	FSC/SC	Not known on site.	None known	Coastal plain and piedmont species; open longleaf pine forests and old fields Documented in the longleaf pine savannas of the Green Swamp in central Brunswick Co.
<i>Ammodramus henslowii</i>	Henslow's sparrow	FSC/SR	Transitory on site. Has been sighted in the surrounding Southport/Oak Island area during the annual Christmas bird count since 1987.	None known	Coastal plain species; clearcut pososins and other damp weedy fields
<i>Charadrius melodus</i>	pipin plover	T/T	Transitory on site. One specimen has occasionally been sighted in the BSEP's return basin during the annual Christmas bird count since 1987.	None known	Tidewater areas; ocean beaches and island-end flats
<i>Falco peregrinus</i>	peregrine falcon	E/E	Transitory on site. Has been sighted in the surrounding Southport/Oak Island area during the annual Christmas bird count since 1987.	None known	Cliffs (for nesting); coastal ponds and mudflats
<i>Haliaeetus leucocephalus</i>	bald eagle	T/E	Transitory on site.	None known	Mature forests near large

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
			Has been sighted in the surrounding Southport/Oak Island area during the annual Christmas bird count since 1987.		bodies of water, lakes and sounds
<i>Mycteria americana</i>	wood stork	E/E	Not known on site as a regular visitor. Company biologist observed two specimens in the BSEP return basin for a period of 2-3 days during 1987.	None known	Tidewater areas: fresh or brackish ponds
<i>Passerina ciris ciris</i>	Eastern painted bunting	FSC/SR	Company biologist have routinely observed this species foraging along the intake canal road. Has also been observed along the discharge canal at Caswell Beach.	None known	Tidewater areas: maritime shrub thickets and forest edges.
<i>Picoides borealis</i>	red-cockaded woodpecker	E/E	Historically known near site. Has been sighted in the surrounding Southport/Oak Island area during the annual Christmas bird count since 1987.	None known	Facility expansion involving removal of large, old long-leaf pine trees will need to be assessed for its occurrence.
<i>Sterna dougalii dougalii</i> +	roseate tern	E/E	Not known on site.	None known	sand flats on maritime islands
Insects <i>Agrotis nr. buchholzi</i>	'Buchholzi' dart moth	FSC/SR	Not known on site.	None known	Flatwoods with pixie moss in the coastal plain

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Problema bulenta</i>	Rare skipper	FSC/SR	Not known on site.	None known	Fresh to brackish marshes in the Wilmington area. Host plant is southern wild rice.
<i>Neonympha mitchellii francisci</i> +	Saint Francis' satyr butterfly	E/SR	Not known on site.	None known	Boggy areas, beaver ponds, and pocosin margins with sedges in sandhills. Host plant sedges.
Clams <i>Elliptio waccamawensis</i>	Waccamaw spike (mussel)	FSC/T	Not known on site	None known	Lake Waccamaw and vicinity
Snails <i>Planorbella magnifica</i> *(N)	magnificent rams-horn	FSC/E	Not known on site	None known	The only two remaining populations known are located at Orton Pond and on the Pleasant Oaks Plantation north of the BSEP.
<i>Helisoma eucosmium</i> = <i>Taphius eucosmius eucosmius</i> *(N)	Greenfield rams-horn	FSC/SR	Not known on site	None known	The only known remaining population is located in Town Creek, north of the BSEP.
<i>Triodopsis soelneri</i> *(N)	Cape Fear threetooth	FSC/T	Not known on site.	None known	Swampy habitats in the extreme southeastern corner of the state. Endemic to North Carolina. Has been documented at Sunny Point Military Ocean Terminal (MOTSU).
Amphibians <i>Rana areolata capito</i> (= <i>R. capito capito</i>)	Carolina crawfish frog (= gopher frog)	FSC/SC	Not known on site	None known	Breeds in temporary fish-free pools; forages in sandy woods, especially pine-oak sandhills. Species has been documented at MOTSU and the White Spring Ponds complex located along the MOTSU access road.
Reptiles <i>Caretta caretta</i>	loggerhead sea turtle	T/T	Has been collected in	Potential for entrapment	Nest on local beaches. Forages

Class/Species	Common Name	Status Fed/State	Location	Impact++	Comments
			the intake canal	on the trash racks at the Plant. Intake modifications to reduce impingement of organisms including turtle blocker panels should minimize entry into the intake canal. Procedures are in place for the live capture, tagging, and release of sea turtles should one enter the canal.	in the middle and lower estuary. CP&L has participated in section 7 consultation with the NRC, USFWS, and the NMFS (January 1998).
<i>Chelonia mydas</i>	green sea turtle	T/T	Has occasionally been collected in the intake canal.	Same as for <i>Caretta caretta</i> .	Same as for <i>Caretta caretta</i> .
<i>Dermochelys coriacea</i>	leatherback sea turtle	E/E	None on site	None known	Remains in the ocean, rarely enters the estuary.
<i>Eretmochelys imbricata</i>	hawksbill sea turtle	E/E	None on site	None known	Remains in the ocean, rarely enters the estuary.
<i>Lepidochelys kempii</i>	Kemp's Ridley sea turtle	E/E	Has occasionally been collected in the intake canal.	Same as for <i>Caretta caretta</i> .	Same as for <i>Caretta caretta</i> .
<i>Ophisaurus mimicus</i>	mimic glass lizard	FSC/SC	Not known on site	None known	Habitat is pine flatwoods, pine/oak sandhills, other pine-oak forests
<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	FSC/SC	Not known on site	None known	Habitat is dry and sandy woods, mainly pine-oak sandhills
<i>Alligator mississippiensis*</i>	American alligator	T(SA)/T	Widespread distribution in the Walden Creek, Intake and Discharge canals	None known. No alligator has ever died as a result of operation of the BSEP. Construction and timbering activities may disturb nest sites.	The American alligator is listed as threatened solely due to similarity of appearance with other rare crocodilians. This species is not biologically endangered or threatened and is not subject to section 7 consultation.

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Malaclemys terrapin centrata*</i>	Carolina diamondback terrapin	/SC	Has occasionally been collected in Walden Crk. And the intake canal during biological sampling.	Potential for impingement of adults. Intake modifications designed to reduce impingement should minimize impact.	Salty or brackish marshes, southern half of the coast
<i>Sistrurus miliarius</i>	Pigmy rattlesnake *	/SR	Not known on site. Closest documented location was approximately 1-mile west of the Plant site adjacent to H.W. 133.	None known.	Pine flatwoods, pine/oak sandhills, other pine/oak forest Proposed for SC status but not adopted by NCWRC. Species is protected from taking.
Fishes					
<i>Acipenser brevirastrum</i>	shortnose sturgeon	E/E	Species is known from the lower Cape Fear river and thus the larvae and adults could be vulnerable to plant impact during spawning in late winter to early spring	None known; population is small and no individuals have ever been collected at BSEP.	Nine adults have been captured in the Cape Fear since 1987
<i>Acipenser oxyrinchus *</i>	Atlantic sturgeon	/SC	Has occasionally been collected during biological sampling at the BSEP.	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	Spawns in the upper Cape Fear River Estuary. Historically, this species was commercially fished in the Brunswick River.
<i>Elassoma boehlkei</i>	Carolina pigmy sunfish	FSC/T	Not known on site	None known	Unsuitable habitat; fresh water
<i>Menidia extensa</i>	Waccamaw silverside	T/T	Not known on site	None known.	Unsuitable habitat; fresh water
<i>Hypsoblenius ionthas *</i>	freckled blenny	/SR	Has occasionally been collected during	potential entrainment of larvae and impingement	Prefers oyster reefs and hard substrates in the middle and

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
			biological sampling at the BSEP	of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	lower estuary. Ranges from North Carolina to the northern Gulf of Mexico.
<i>Microphis brachyurus</i> *	opposum pipefish	/SR	Has occasionally been collected during biological sampling at the BSEP	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	Ranges from North Carolina to the northern Gulf of Mexico. Species is rare throughout its entire range.
<i>Eleotris pisonis</i> *	spinycheck sleeper	/SR	Has occasionally been collected during biological sampling at the BSEP.	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	Fresh to brackish ponds and estuaries; This species is at the extreme northern end of its range, thus this species is not abundant.
<i>Evorthodus lyricus</i> *	lyre goby	/SR	Has occasionally been collected during biological sampling at the BSEP	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	Shallow tidal water, salt marsh pools. This species is at the extreme northern end of its range, thus this species is not abundant.
<i>Gobionellus stigmaticus</i> *	marked goby	/SR	Has occasionally been collected during biological sampling at the BSEP.	Potential entrainment of larvae and impingement of adults. Intake modifications designed to reduce entrainment and impingement should minimize potential impact.	Shallow salt and brackish water. This species is at the extreme northern end of its range, thus this species is not abundant.

Class/Species	Common Name	Status Fed./State	Location	Impact++ impact.	Comments
Mammals					
<i>Felis concolor cougar</i>	eastern cougar	E/E	Unconfirmed sightings on property in last three years.	None known	Extensive forest, remote areas
<i>Trichechus manatus</i>	West Indian manatee	E/E	Not known on site	None known	Warm estuarine waters, river mouths
<i>Sorex longirostris fisheri</i> +	Dismal Swamp Southeastern shrew	T/T	Not known on site	None known	Woodlands and brushy fields, especially where damp, in lower coastal plain
Plants					
<i>Asclepias pedicellata</i> *	savanna milkweed	/C	Not known on site	None known	Known in Brunswick County; dry savannas and moist flatwoods
<i>Amaranthus pumilus</i>	seabeach amaranth	T/T	Not known on site	None known	Occurs on ocean beaches and island-end flats including Brunswick County
<i>Amorpha georgiana confusa</i> *	savanna indigo bush	FSC/T	Not known on site	None known	Known in Brunswick County; wet savannas
<i>Amorpha georgiana georgiana</i>	Georgia indigo bush = Georgia lead-plant	FSC/T	Not known on site	None known	Possible suitable habitat of wet savannas on site
<i>Asplenium heteroresiliens</i>	Carolina spleenwort	FSC/E	Not known on site	None known	Not known in Brunswick County.
<i>Astragalus michauxii</i>	Sandhills milkvetch	FSC/C-PT	Not known on site	None known	Not known in Brunswick County
<i>Balduina atropurpurea</i>	honeycomb head	SC/C	Not known on site	None known	Known <i>only</i> in Brunswick County in savannas
<i>Campylopus carolinae</i>	savannah campylopus	SC/C	Not known on site	None known	Known in Brunswick County in sandhills and savannas
<i>Carex chapmanii</i>	Chapman's sedge	SC/W1	Not known on site	None known	Known in Brunswick County in moist bottomlands; associated with marl
<i>Dichanthelium</i>	erectleaf witch grass	/SR	Not known on site	None known	Known in Brunswick County;

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Rhynchospora pleiantha</i> *	(=beaksedge) coastal beaksedge	/C	Not known on site	None known	habitat is swamp forest Known in Brunswick County; limesink ponds
<i>Rhynchospora scirpoides</i> *	long-beak baldsedge	/SR	Not known on site	None known	Known in Brunswick County; limesink and beaver ponds, wet savannas
<i>Rhynchospora thornei</i>	Thorne's beaked-rush (=beaksedge)	SC/C-PE	Not known on site	None known	Known in Brunswick County; habitat wet savannas
<i>Rhynchospora traceyi</i> *	Tracy's beaksedge	/SR	Not known on site	None known	Known in Brunswick County; limesink ponds, clay-based Carolina bays
<i>Rudbeckia heliopsidis</i>	blackeyed Susan (=sun-facing coneflower)	SC/E	Not known on site	None known	Not known in Brunswick County; habitat is pine flatwoods and woodland borders in Moore and Harnett counties
<i>Sagittaria isoetiformis</i> *	quillwort arrowhead	/SR	Not known on site	None known	Known in Brunswick County; limesink and beaver ponds, clay-based Carolina bays, natural lakes
<i>Schwalbea americana</i>	American chaffseed	E/E	Not known on site	None known	Not known in Brunswick County; habitat is moist to dry pinelands with frequent fires
<i>Scleria georgiana</i> *	Georgia nutrush	/SR	Not known on site	None known	Known in Brunswick County; savannas
<i>Solidago pulchra</i>	Carolina goldenrod	SC/E	Not known on site	None known	Known in Brunswick County; savannas
<i>Solidago verna</i>	spring-flowering goldenrod	SC/E-PT	Not known on site	None known	Known in Brunswick County; habitat is mesic to moist pinelands and pocosin ecotones
<i>Sporobolus teretifolius</i>	wireleaf dropseed	FSC/T	Not known on site	None known	Known in only Brunswick and Columbus counties; habitat is wet savannas
<i>Sphagnum fitzgeraldii</i> *	Fitzgerald's peatmoss	/SR	Not known on site	None known	Known in Brunswick County; pocosins and savannas
<i>Stylisma pickeringii</i> (=Bonanmia)	Pickering's morning-glory (=dawnflower)	SC/E	Not known on site	None known	Unsuitable habitat; known in sandhills counties

Class/Species	Common Name	Status Fed./State	Location	Impact++	Comments
<i>Thalictrum cooleyi</i>	Cooley's meadowrue	E/E	Known power line ROWs off-site	Species is managed under ROWs in agreement with the N.C. Natural Heritage Program.	Habitat is wet savannas; facilities expansion or additional power lines would require assessments
<i>Tofieldia glabra</i>	smooth bog-asphodel (= Carolina asphodel)	SC/C	Not known on site	None known	Known in Brunswick County; habitat is savannas, moist sandhills, and pocosin ecotones
<i>Trichostema sp.1</i>	blue curls (=dune bluecurls), undescribed species	SC/C	Not known on site	None known	Known in Brunswick County; habitat is dunes, openings in maritime forest and scrub.
<i>Utricularia olivacea</i> *	dwarf bladderwort	T	Not known on site	None known	Known in Brunswick County; limesink and beaver ponds
<i>Xyris brevifolia</i> *	shortleaf yellow-eyed grass	/SR	Not known on site	None known	Known in Brunswick County; savannas; other wet areas

Key:

- C—Probable candidate for endangered or threatened status
- C-PE—Candidate for proposed endangered status
- C-PT—Candidate for proposed threatened status
- C-SC—Candidate for Special Concern status
- E—Endangered
- E-PT—Currently endangered but a candidate for proposed threatened status
- FSC—Federal Species of Concern
- PC—Proposed candidate for listing status
- SC—Special concern
- SR—Significantly rare
- T—Threatened
- T(S/A)—Threatened due to Similarity of Appearance
- W—State of N.C. "Watch" list

Species with no superscript designation are the species identified in the Pacific Northwest National Laboratory report for the NRC. A few species are dually listed on the PNNL report AND a state list; those are identified with an "N," meaning the PNNL report for the NRC.

Species noted with an asterisk (*) are listed by the State of N. C. Natural Heritage Program. No location data of these species is to be distributed to the general public (i.e., through newspapers, magazines, etc.) without the permission from the N. C. Natural Heritage Program of the North Carolina Department of Environment and Natural Resources. Species noted with a (+) are listed on the U. S. Fish and Wildlife Service, Region 4 endangered species list for North Carolina.

++CP&L resources for contact by plant personnel for updated information include personnel in the Environmental Services Section, Real Estate Management Section, and Transmission Department.

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