

Biological Assessment

**H.B. Robinson Steam Electric Plant,
Unit 2 (Nuclear)**

License Renewal Review

Hartsville, South Carolina

April 2003

**U.S. Nuclear Regulatory Commission
Rockville, Maryland**

Biological Assessment of the Effects of the H. B. Robinson Steam Electric Plant, Unit 2 (Nuclear) License Renewal on Threatened and Endangered Species

Executive Summary

This Biological Assessment evaluates the potential impacts of the license renewal of the H.B. Robinson Steam Electric Plant, Unit 2 (Nuclear) (RNP) on Federally listed endangered and threatened species. There will be no major construction, refurbishment or replacement activities associated with this action. The Nuclear Regulatory Commission (NRC) has determined that license renewal for RNP will have no effect on the bald eagle, shortnose sturgeon, Atlantic sturgeon, or the Carolina heelsplitter and may affect, but is not likely to adversely affect the red-cockaded woodpecker, Canby's dropwort, chaffseed, or the rough-leaved loosestrife.

Project Description

The NRC licenses the operation of domestic nuclear power plants in accordance with the Atomic Energy Act of 1954, as amended, and NRC implementing regulations. Carolina Power and Light (CP&L), a Progress Energy company, operates the RNP plant pursuant to NRC Operating License DPR-23. The license will expire July 31, 2010. The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decision makers (NRC 1996). The renewed operating license would allow an additional 20 years of plant operation beyond the current RNP licensed operating period of 40 years.

There will be no major refurbishment or replacement actions to maintain the functionality of important systems, structures, and components during the RNP license renewal period. In addition, there will be no construction activities associated with the RNP license renewal.

Description of Project Area

The Robinson site is located in northeastern South Carolina, approximately 8 km (5 miles) west-northwest of Hartsville, SC (Fig. 1). The nearest large city is Columbia, South Carolina, approximately 88 km (55 miles) west-southwest. The site is approximately 48 km (30 miles) south of the North Carolina border and 145 km (90 miles) from the Atlantic Ocean. The site encompasses more than 2,000 ha (5,000 acres) of CP&L property in northwestern Darlington and southwestern Chesterfield Counties, including the 827-ha (2,250-acre) Lake Robinson. Approximately 98 ha (243 acres) consist of generation and maintenance facilities, laydown areas, parking lots, roads, and mowed grass (Kiker 1996). The remaining portion of the site

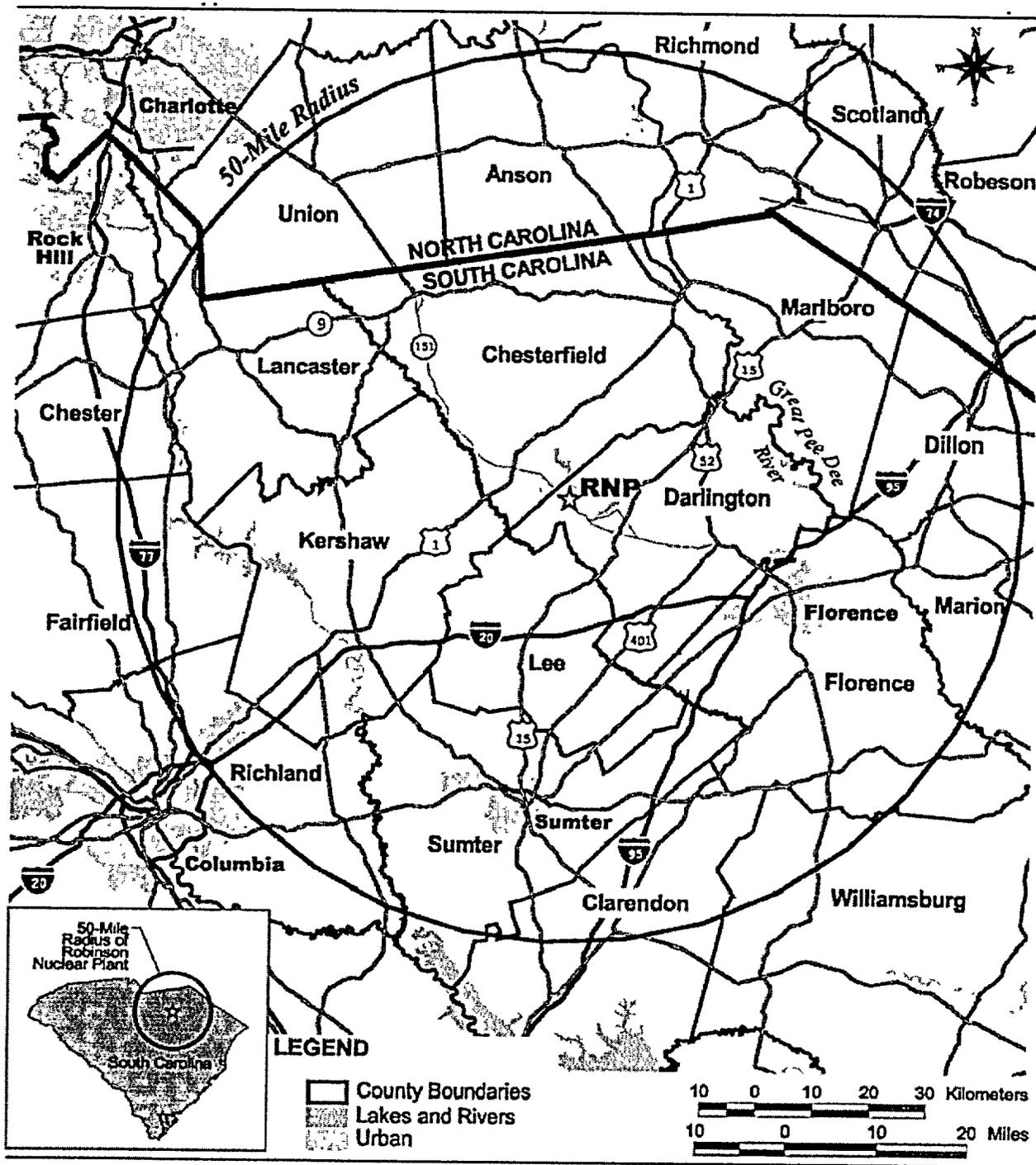


Figure 1. Robison Site (RNP) and Surrounding Area

consists primarily of forested areas, residences, recreation leases, and farm rentals. Numerous dwellings are located along the eastern shoreline of Lake Robinson. The Robinson site is along the boundary of the Carolina Sandhills, a region of uneven topography with enough relief to adequately drain the higher elevations, and the Upper Coastal Plain, a region of low relief and generally poor drainage.

The primary terrestrial plant community in the vicinity of the site is the pine-turkey oak-wire grass community typical of the Sandhills (Barry 1980). This community is characterized by longleaf pine (*Pinus palustris*) and loblolly pine (*P. taeda*) with a midstory of oaks, chiefly turkey oak (*Quercus laevis*), along with blackjack oak (*Q. marilandica*), upland willow oak (*Q. incana*), and post oak (*Q. stellata*). Most of the upland CP&L property west of Lake Robinson and south of Secondary State Route 346 consists of forest from which timber has been harvested in recent years. After timber is removed, areas are replanted with tree species appropriate to the terrain, soils, and drainage characteristics of the site. Harvested areas are usually replanted in loblolly pine, slash pine (*P. elliotii*), or longleaf pine. Approximately 140 ha (346 acres) of CP&L property at the north of the site is leased to the South Carolina Department of Natural Resources (SCDNR) and is managed by SCDNR as a wildlife management area for activities such as public hunting and fishing.

The Pee Dee River Basin, also referred to as the Great Pee Dee River Basin, encompasses 27 watersheds and 887,075 ha (3,425 square miles) within South Carolina, excluding the Lynches River and Black River Basins. The Pee Dee River flows across the North Carolina/South Carolina state line and accepts drainage from Thompson Creek, Crooked Creek, Cedar Creek, Three Creeks, and then Black Creek, where Lake Robinson is located. The Pee Dee River then accepts drainage from Jeffries Creek, Catfish Creek, the Lynches River, the Little Pee Dee River and the Black River Basin before draining into Winyah Bay (SCDHEC 2001).

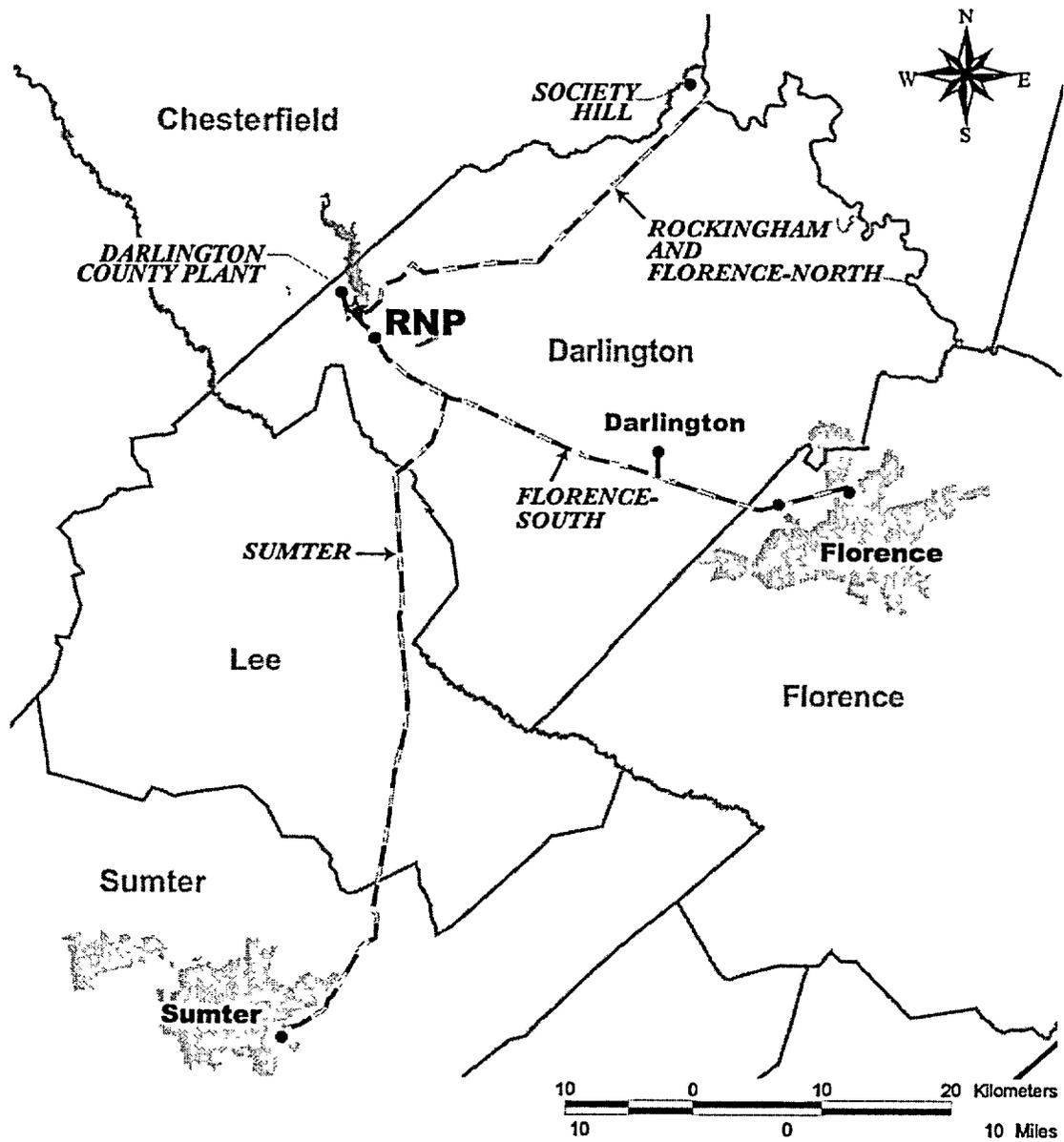
Black Creek was impounded in the late 1950's to create Lake Robinson and provide cooling water for the Unit 1 coal-fired power plant and Unit 2 nuclear plant. RNP is located on the southwest shore of Lake Robinson, approximately 113 river kilometers (70 river miles) upstream from Black Creek's junction with the Pee Dee River. The lake provides some limited marsh habitat in shallow backwaters at the north (upstream) end of the impoundment. These marshes and adjacent shallows are used by various waterfowl such as the mallard (*Anas platyrhynchos*), green-winged teal (*A. crecca*), wood duck (*Aix sponsa*), and Canada goose (*Branta canadensis*). The impoundment at Lake Robinson has no fish passage facilities, precluding access to the lake by anadromous fish species. Bottomland forest habitat occurs along Black Creek and is characterized by cypress (*Taxodium distichum*), white cedar (*Chamaecyparis thyoides*), red maple (*Acer rubrum*), water oak (*Q. nigra*), red bay (*Persea borbonia*), sweet bay (*Magnolia virginiana*), and black willow (*Salix nigra*) (NRC 1975). Roughly 8 km (5 river miles) downstream from Lake Robinson, Black Creek enters the Prestwood Lake impoundment. The Prestwood Dam also lacks fish passage facilities.

Black Creek from Lake Robinson to Prestwood Lake is classified by SCDHEC as freshwaters (dissolved oxygen not less than 4 mg/l and pH between 5.0 and 8.5). Freshwaters are considered suitable for the survival and propagation of aquatic life, fishing, recreational contact, industrial and agricultural uses, and as a drinking water source. Based on almost 30 years of monitoring, the aquatic community of Lake Robinson appears to be healthy and indicative of a balanced, self-sustaining biological community (CP&L 2002). Thermal-related impacts are transient and evident only during the hottest summer months, with recovery evident by fall (CP&L 1996). There is no indication of long-term degradation of the aquatic community due to heated discharges. Changes in aquatic population distribution and abundance over the 1975-1995 period were attributed to normal population cycles and ecological succession, as mediated through annual variation in a variety of environmental factors (e.g., nutrient inputs and pH), predation, competition, and recovery of the ecosystem from copper toxicity. These changes occurred in both heated areas of the impoundment and in areas of the impoundment less influenced by thermal inputs. Overall, Lake Robinson continues to support a balanced, indigenous community of benthic macroinvertebrates, plankton, and fish, as demonstrated by monitoring studies conducted by CP&L (CP&L 1996).

Robinson-associated transmission corridors are situated within the Carolina Sandhills and Upper Coastal Plain physiographic regions (Fig. 2). The principal land use categories traversed by the transmission corridors are row crops, pasture, and forest. Wooded habitats along transmission corridors consist of pine forest, pine-hardwood forest, and bottomland hardwood forest.

CP&L conducts an annual assessment for the potential presence of Federally threatened and endangered (T&E) species at the site and associated transmission lines. The South Carolina Heritage Trust maintains a database of rare, endangered, and threatened species in South Carolina. The database lists the geographic locations of these populations and their habitats. No T&E species have been reported on the Robinson property or transmission lines. Programs are in place to manage and protect T&E species on Robinson property, should they be identified.

There is no designated critical habitat for endangered species on the Robinson site or along associated transmission lines. The transmission corridors also do not cross any State or Federal parks, wildlife refuges, or wildlife management areas. The transmission corridors are maintained by mowing, trimming of undesirable vegetation from the sides of the corridors, and by use of non-restricted use herbicides. Under normal circumstances, the mowing and herbicide schedule follows a three-year cycle. CP&L participates with the U.S. Department of Agriculture Natural Resources Conservation Service, SCDNR, and other organizations in a wildlife management program designed to help landowners whose property is crossed by transmission line corridors create productive habitat for wildlife.



LEGEND

- Substations
- ▲ Transmission Lines
- County Boundaries
- ▨ Lakes and Rivers
- ▤ Urban

Figure 2. Robinson Site (RNP) and Associated Transmission Lines

List of Species

The NRC has identified seven species listed as threatened or endangered under the Federal Endangered Species Act and one candidate species with the potential to be affected by this action (Table 1). The NRC is unaware of any other species proposed for listing by the FWS or National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) [formerly National Marine Fisheries Service (NMFS)] or species that may warrant listing in the future, but have no current statutory protection under the Endangered Species Act, that occur on the Robinson site or along associated transmission line rights-of-way.

Table 1. Federal Endangered, Threatened, and Candidate species for Chesterfield, Darlington, Florence, Lee, and Sumter Counties. This list was based on information received from the FWS (FWS, 2001b), NOAA Fisheries, and the SCDNR.

Scientific Name	Common Name	Federal Status ^(a)	Determination
Invertebrates			
<i>Lasmigona decorata</i>	Carolina heelsplitter	E	no effect
Fish			
<i>Acipenser brevirostrum</i>	shortnose sturgeon	E	no effect
<i>Acipenser oxyrinchus</i>	Atlantic sturgeon	C	no effect
Birds			
<i>Haliaeetus leucocephalus</i>	bald eagle	T	no effect
<i>Picoides borealis</i>	red-cockaded woodpecker	E	not likely to adversely affect
Plants			
<i>Oxypolis canbyi</i>	Canby's dropwort	E	not likely to adversely affect
<i>Schwalbea americana</i>	chaffseed	E	not likely to adversely affect
<i>Lysimachia asperulaefolia</i>	rough-leaved loosestrife	E	not likely to adversely affect
(a) E = endangered, T = threatened, C = candidate			
Sources: Based on FWS [http://endangered.fws.gov], and Southeast Regional Office and NOAA Fisheries [http://caldera.sero.nmfs.gov/protect/sc_cand.htm]			

Species Evaluated

Terrestrial Species

1. *Haliaeetus leucocephalus*, Bald eagle.

Bald eagles are Federally listed as threatened. Bald eagles are occasionally observed at Lake Robinson (CP&L 1998), but there are no known eagle nests in the vicinity of the impoundment (SCDNR 2001a). Bald eagles are generally found in close proximity to impoundments, rivers, and coastal areas (FWS 2001a). Bald eagles are known to nest in Florence County (SCDNR

2001b), but there are no known nests in the vicinity of the Robinson site or the associated transmission line corridors (SCDNR 2001a). Therefore, the NRC staff has determined that the proposed license renewal would have no effect on the bald eagle.

Within the past decade various species of waterfowl and birds of prey (including at least 70 bald eagles) in the SE United States, have died from a condition now known as avian vacuolar myelinopathy (AVM). Although the actual cause of death has not been determined, it appears that waterfowl and their predators are being killed by an environmental toxin that produces brain lesions (Interagency AVM Website 2003). AVM has been identified at numerous lakes in the southern United States and is often associated with the introduced aquatic plant hydrilla (*Hydrilla verticillata*) and one or more species of blue-green algae. CP&L employees and contractors are aware of the problem and monitoring activities have not recorded any unexplained avian deaths at Lake Robinson and hydrilla is not known to occur there. There is no indication that activities associated with license renewal would have any effect on the presence of AVM at Lake Robinson.

2. *Picoides borealis*, Red-cockaded woodpecker

Red-cockaded woodpeckers are Federally listed as endangered and are known to occur in Darlington, Chesterfield, Lee, Sumter, and Florence Counties (SCDNR 2001b). Active nest cavities of this cooperative breeder occur in open, mature pine stands with sparse midstory vegetation (FWS 2001a). An active red-cockaded woodpecker colony is located in Sandhills State Forest, approximately 8.3 km (5.2 miles) northwest of the Robinson site (SCDNR 2001a). Two abandoned red-cockaded woodpecker cavity trees are located on the Robinson site near the Darlington County Plant (a gas turbine power plant owned by CP&L) which is approximately 1.6 km (1 mile) north of the Robinson site (Fig. 2). Both of these cavity trees have been abandoned for many years. CP&L conducted a field survey for the red-cockaded woodpecker in 1999 throughout the Robinson site; the survey identified no active cavity trees and no foraging habitat for this species. CP&L requires surveys to be conducted when there is timber harvesting or clearing of pine trees at the site. In accordance with a Safe Harbor Agreement with the State of South Carolina, CP&L manages the site to maintain and enhance habitat for red-cockaded woodpeckers (CP&L 1999). There are no known active or abandoned cavity trees adjacent to Robinson-associated transmission line corridors (SCDNR 2001a). No individuals have been recorded, no active nests are present, there is no foraging habitat, and no new construction activities are expected during the renewal term. However, the NRC staff has determined that due to the proximity of active nest sites and the presence of abandoned nests on the Robinson site, the proposed license renewal of RNP may affect, but is not likely to adversely affect the red-cockaded woodpecker.

3. *Oxypolis canbyi*, Canby's dropwort

Canby's dropwort is Federally listed as endangered. This perennial plant is known to occur in Lee, Sumter, and Florence Counties (SCDNR 2001b). This coastal plain species grows in wet meadows, wet pineland savannas, ditches, sloughs, and along the edges of cypress-pine

ponds (FWS 2001a). There are no recorded occurrences of this species on the site or along the transmission line corridors associated with RNP (SCDNR 2001a). Because habitat for this species may exist within the site and/or transmission corridors and may even be maintained by CP&L activities, the NRC staff has determined that the proposed license renewal may affect, but is not likely to adversely affect the Canby's dropwort.

4. *Schwalbea americana*, Chaffseed

Chaffseed is Federally listed as endangered. Habitat for this perennial herb consists of open, moist flatwoods, fire-maintained savannas, ecotones between peaty wetlands and xeric sandy soils, and other open grass-sedge systems. Factors such as fire, mowing, or fluctuating water tables are necessary to maintain the open to partly open conditions that chaffseed requires (FWS 2001a). Chaffseed has been recorded in Lee, Florence, and Sumter Counties (SCDNR 2001b), but there are no recorded occurrences on the site or along the transmission line corridors associated with RNP (SCDNR 2001a). Because habitat for this species may exist within the site and/or transmission corridors and may even be maintained by CP&L activities, the NRC staff has determined that the proposed license renewal may affect, but is not likely to adversely affect the chaffseed.

5. *Lysimachia asperulifolia*, Rough-leaved loosestrife

Rough-leaved loosestrife is Federally listed as endangered. Habitat for this perennial herb consists of Carolina bays and the ecotones between longleaf pine uplands and pond pine pocosins, an upland swamp community type (FWS 2001a). The species has been recorded in Darlington County (SCDNR 2001b), but there are no recorded occurrences on the site or along the transmission line corridors associated with RNP (SCDNR 2001a). Because habitat for this species may exist within the site and/or transmission corridors and may even be maintained by CP&L activities, the NRC staff has determined that the proposed license renewal may affect, but is not likely to adversely affect the rough-leaved loosestrife.

Aquatic Species

1. *Acipenser brevirostrum*, shortnose sturgeon

Shortnose sturgeons are Federally listed as endangered. Shortnose sturgeon occur in most major river systems along the eastern seaboard of the United States. In South Carolina they are found in the river systems that empty into Winyah Bay (including the Pee Dee River) and in the Santee/Cooper River complex (Fig. 3). Shortnose sturgeon were documented in the Winyah Bay system during the late 1970's and early 1980's (Dadswell et al. 1984). Fed by the Waccamaw, Pee Dee, and Black Rivers, this coastal plain watershed produced over 100 collections of juveniles and adults during the study period. No data on population dynamics exist (NMFS 1998).

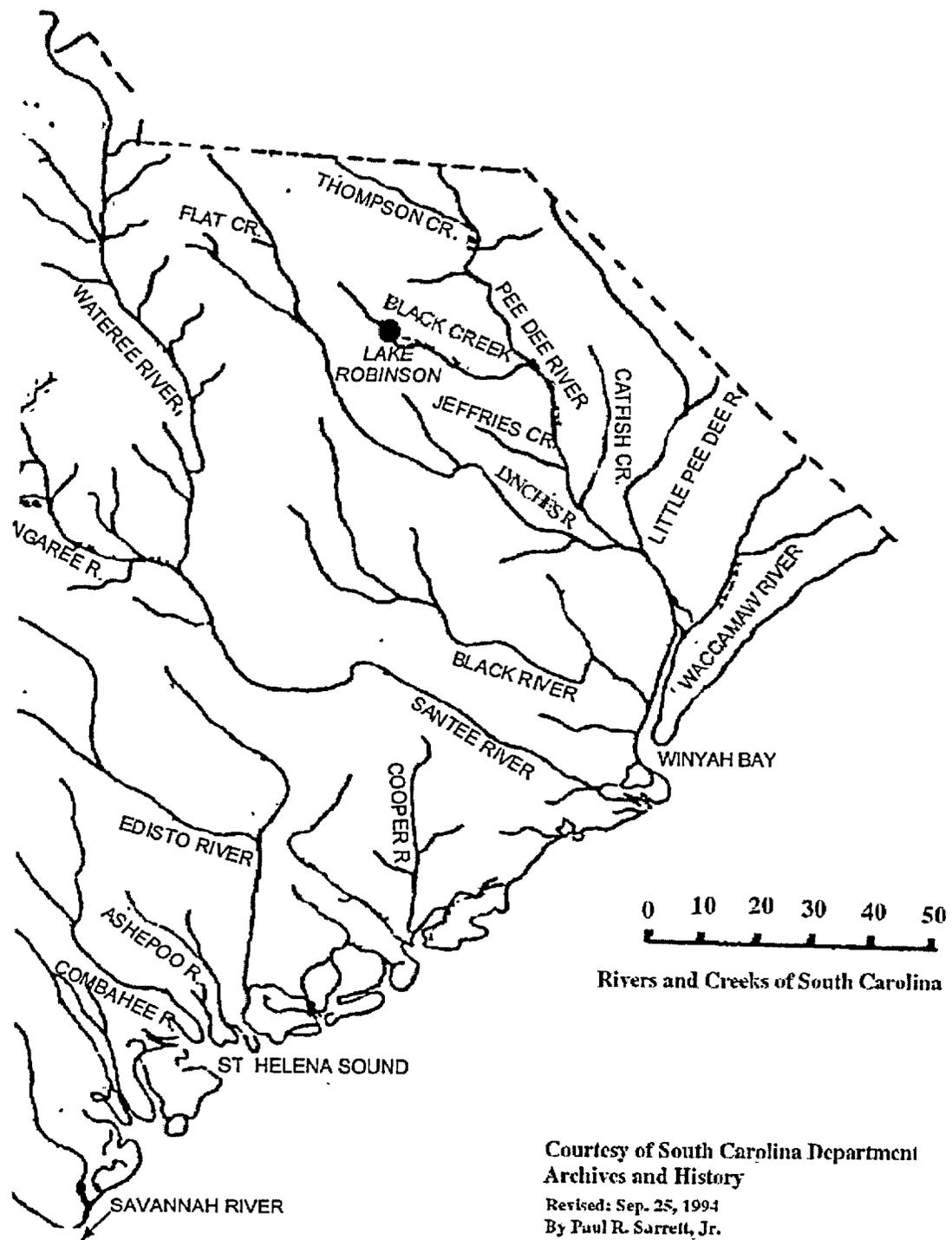


Figure 3. The Pee Dee River and its Tributaries

These anadromous fish live mainly in slower moving riverine waters or in nearshore marine waters, and migrate periodically into faster moving fresh water areas to spawn. Feeding and overwintering activities may occur in both fresh and saline habitats (NMFS 1998). The shortnose sturgeon is listed in Chesterfield, Darlington, Florence and Sumter Counties by the USFWS Southeast Regional Office on their website (FWS 1999), but the species is not known to occur in Black Creek. Typically, the first dam on the river marks the upstream limit of the shortnose sturgeon population's range (Kynard 1997). Thus, it is assumed that the impoundments at Prestwood Lake and Lake Robinson, which lack fish passage facilities, prevent sturgeon from accessing Lake Robinson and from being impacted by RNP cooling water intake effects, such as impingement and entrainment.

Because shortnose sturgeon do not inhabit Lake Robinson or Black Creek in the region above Prestwood Lake, the NRC staff has determined that the proposed license renewal would have no effect on the shortnose sturgeon.

2. *Acipenser oxyrinchus*, Atlantic sturgeon

Atlantic sturgeons were listed in 1988 as a candidate for Federal listing by NMFS. Candidate species are not protected under the Endangered Species Act, but concerns about their status indicate that they may warrant listing in the future. This designation was reiterated in 1998 when an exhaustive status review of the species was conducted, detailing the biology, analysis of threats, conservation efforts, and recommendations for further studies (NMFS/FWS 1998). NOAA Fisheries has retained the Atlantic sturgeon on its list of candidate species to monitor the sturgeon's status and the implementation and effectiveness of protective measures.

Because juvenile Atlantic sturgeon leave their apparent natal river at 2-5 years of age and may wander extensively, visiting other rivers and estuaries, direct evidence for existence of a population in a specific river requires capture of very young fish (age 0-1) or mature fish on the spawning grounds. In South Carolina there appear to be populations in the Savannah River, one or more of the rivers flowing into St. Helena Sound (Ashepoo, Combahee, and Edisto Rivers), the Santee River, one or more Winyah Bay rivers (Pee Dee, Waccamaw, and Black), and probably the Cooper River (Fig. 3) (SCDNR 2003). Specifically, the 1998 status report stated that captures of age 1 juveniles from the Waccamaw River during the early 1980's suggests that a reproducing population of Atlantic sturgeon may persist in that river, although the fish could have been from the nearby Pee Dee River (Collins and Smith 1997). It is possible that the Pee Dee and Black Rivers support spawning populations.

Because Atlantic sturgeon are not present in the upper reaches Black Creek due to the creek's small size and because of the lack of fish passage facilities at the Prestwood Lake or Lake Robinson dams, the Atlantic sturgeon will not be impacted by continued operation of RNP. Thus, the NRC staff has determined that the proposed license renewal would have no effect on the Atlantic sturgeon.

3. *Lasmigona decorata*, Carolina heelsplitter

Prior to a 1987 FWS survey, the Carolina heelsplitter had not been recorded in the state since the mid-19th century (Keferl and Shelly 1988 as cited in FWS 1993, Keferl 1991 as cited in FWS 1993). This Federally listed (endangered) freshwater mussel was historically found in South Carolina in the Pee Dee River system (Clarke 1985 as cited in FWS 1993, Keferl and Shelly 1988 as cited in FWS 1993, Keferl 1991 as cited in FWS 1993). The FWS conducted intensive surveys between 1987 and 1990 and found only two surviving populations of the Carolina heelsplitter in the Pee Dee River system; the Goose Creek and Lynches River/Flat Creek populations (Fig. 3) (Keferl 1991 as cited in FWS 1993). The population nearest the plant was found in the Lynches River along the western boundary of Chesterfield County (FWS 1993) During the FWS surveys, a total of only 12 live individuals were found in Flat Creek (1987-1990) and 2 individuals were found in the Lynches River (both found in 1990). Because the Carolina heelsplitter populations exist only in other tributaries to the Pee Dee River and not in Black Creek, the NRC staff has determined that the proposed license renewal would have no effect on the Carolina heelsplitter.

Conclusions

The NRC has identified seven species listed as threatened or endangered under the Federal Endangered Species Act and one candidate species with the potential to be affected by the license renewal of RNP. There will be no major refurbishment, construction or replacement activities associated with this action. The NRC has determined that license renewal for RNP will have no effect on the bald eagle, shortnose sturgeon, Atlantic sturgeon, and the Carolina heelsplitter and may affect, but is not likely to adversely affect the red-cockaded woodpecker, Canby's dropwort, chaffseed, and the rough-leaved loosestrife.

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