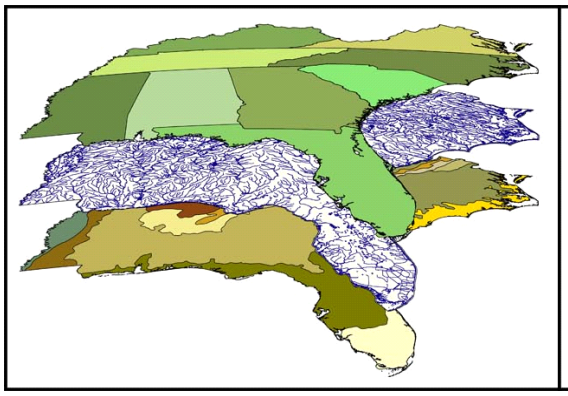


SOUTHEAST GAP ANALYSIS PROJECT

USGS science for a changing world | gap | Biodiversity and Spatial BaSIC Information Center | NARSAL

Species Modeling Report

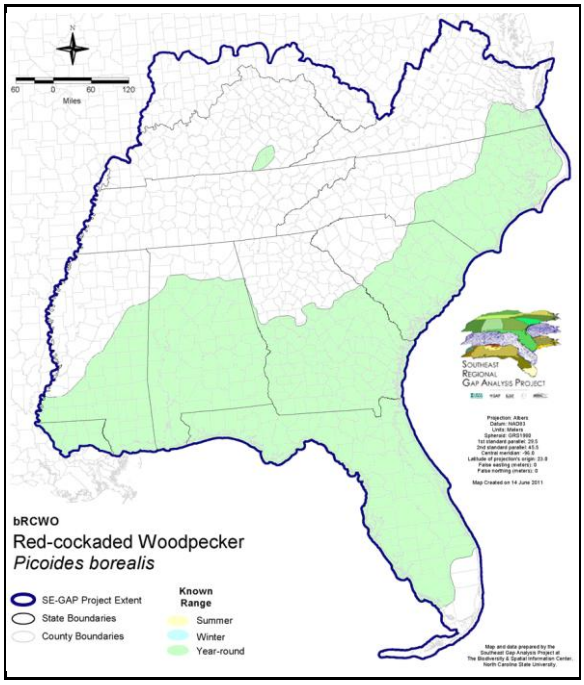
Red-cockaded Woodpecker

Picoides borealis

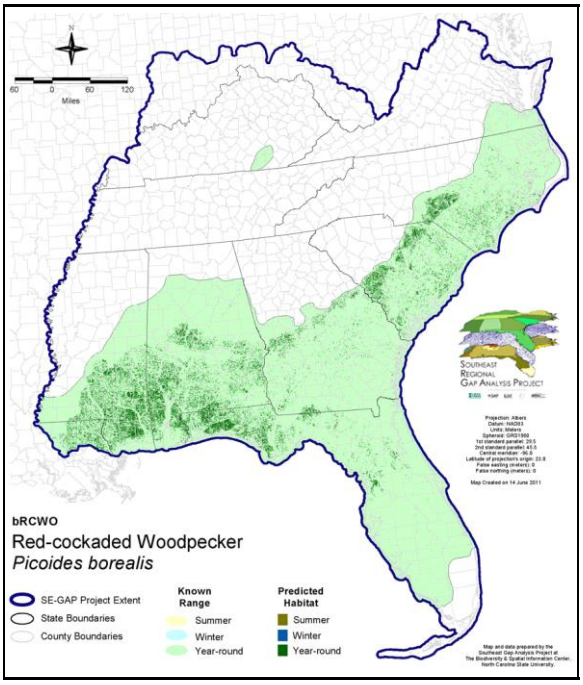
Taxa: Avian
Order: Piciformes
Family: Picidae

SE-GAP Spp Code: **bRCWO**
ITIS Species Code: 178257
NatureServe Element Code: ABNYF07060

KNOWN RANGE:



PREDICTED HABITAT:



Range Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE_Range_bRCWO.pdf
Predicted Habitat Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE_Dist_bRCWO.pdf
GAP Online Tool Link: http://www.gapserve.ncsu.edu/segap/segap/index2.php?species=bRCWO
Data Download: http://www.basic.ncsu.edu/segap/datazip/region/vert/bRCWO_se00.zip

PROTECTION STATUS:

Reported on March 14, 2011

Federal Status: LE

State Status: AL (SP), FL (FE), GA (E), KY (X), LA (Endangered), MD (X), MS (LE), NC (E), SC (SE-Endangered), TX (E), VA (LE)

NS Global Rank: G3

NS State Rank: AL (S2), AR (S2), FL (S2), GA (S2), KY (SX), LA (S2), MD (SHB), MO (SX), MS (S1), NC (S2), OK (S1), SC (S2), TN (SX), TX (S2B), VA (S1)

SUMMARY OF PREDICTED HABITAT BY MANAGMENT AND GAP PROTECTION STATUS:

	US FWS		US Forest Service		Tenn. Valley Author.		US DOD/ACOE	
	ha	%	ha	%	ha	%	ha	%
Status 1	2,315.0	< 1	531.1	< 1	0.0	0	0.0	0
Status 2	13,725.2	< 1	8,276.3	< 1	0.0	0	6.3	< 1
Status 3	0.0	0	304,723.3	7	0.0	0	207,676.9	5
Status 4	0.0	0	0.0	0	0.0	0	0.0	0
Total	16,040.2	< 1	313,530.7	7	0.0	0	207,683.2	5

	US Dept. of Energy		US Nat. Park Service		NOAA		Other Federal Lands	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	28.1	< 1	0.0	0	0.0	0
Status 2	0.0	0	49.7	< 1	187.3	< 1	29.9	< 1
Status 3	28,078.8	< 1	7.6	< 1	0.0	0	1,428.8	< 1
Status 4	0.0	0	0.0	0	0.0	0	0.0	0
Total	28,078.8	< 1	85.3	< 1	187.3	< 1	1,458.7	< 1

	Native Am. Reserv.		State Park/Hist. Park		State WMA/Gameland		State Forest	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	112.3	< 1	0.0	0	0.0	0
Status 2	0.0	0	0.0	0	15,610.9	< 1	0.0	0
Status 3	87.4	< 1	19,979.8	< 1	25,745.4	< 1	95,463.9	2
Status 4	0.0	0	0.0	0	15,704.7	< 1	23.8	< 1
Total	87.4	< 1	20,092.1	< 1	57,061.0	1	95,487.7	2

	State Coastal Reserve		ST Nat.Area/Preserve		Other State Lands		Private Cons. Easemt.	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	1,634.9	< 1	0.0	0	0.0	0
Status 2	152.4	< 1	2,122.8	< 1	0.0	0	428.7	< 1
Status 3	0.0	0	1,033.1	< 1	2,275.5	< 1	5,598.5	< 1
Status 4	0.0	0	0.0	0	0.0	0	0.0	0
Total	152.4	< 1	4,790.8	< 1	2,275.5	< 1	6,027.2	< 1

	Private Land - No Res.		Water		Overall Total	
	ha	%	ha	%	ha	%
Status 1	0.0	0	0.0	0	4,621.3	< 1
Status 2	0.0	0	0.0	0	40,589.4	< 1
Status 3	1.3	< 1	0.0	0	692,100.3	22
Status 4	3,441,755.9	76	348.4	< 1	3,473,537.5	77
Total	3,441,757.1	76	348.4	< 1	4,210,848.5	100

GAP Status 1: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a natural state within which disturbance events (of natural type, frequency, and intensity) are allowed to proceed without interference or are mimicked through management.

GAP Status 2: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a primarily natural state, but which may receive use or management practices that degrade the quality of existing natural communities.

GAP Status 3: An area having permanent protection from conversion of natural land cover for the majority of the area, but subject to extractive uses of either a broad, low-intensity type or localized intense type. It also confers protection to federally listed endangered and threatened species throughout the area.

GAP Status 4: Lack of irrevocable easement or mandate to prevent conversion of natural habitat types to anthropogenic habitat types. Allows for intensive use throughout the tract. Also includes those tracts for which the existence of such restrictions or sufficient information to establish a higher status is unknown.

PREDICTED HABITAT MODEL(S):

Year-round Model:

Habitat Description: Caveat to the GAP model: Several mechanisms for population regulation have been reported as potential causes for decline in Red-cockated woodpecker populations, all of which relate indirectly to habitat suitability. However only some of the potential mechanisms relate directly to habitat availability. Competition with other species for nest cavities, forest age and fire regime, are important factors in modeling realized (available) habitat. Thus a map of potential habitat produced by the southeast regional GAP, may not be an effective representation of realized potential (available) habitat. Many of the direct habitat mechanisms for population regulation occur at much finer scales than those scales used to produce GAP landcover maps; forest age is a case in point. K. Cook - 4-27-05

The following habitat notes are quoted directly from the State habitat notes, but have been reorganized. K. Cook -4-27-05

Restricted to southern pine forests, the largest red-cockated woodpecker populations are found in longleaf pine, although loblolly pine, short leaf pine, pond pine, slash pine, and rarely Virginia pine and pitch pine are also used. Open, park like pine savanna with little hardwood understory is preferred (NATURESERVE). The red-cockaded woodpecker has a cooperative breeding system (Walters et al. 1989). Cooperative breeding systems are very rare among birds (Koenig and Pitelka 1981, Walters 1991), and an understanding of the general ecology of red-cockaded woodpeckers requires an understanding of this system, especially since the system appears to be molded by the pyrogenic nature of the habitat (Jackson 1971). Evidence suggests that a forest fire interval of 1-5 years may be a necessary component in breeding habitat (Jackson et al. 1986). Fire during the growing season is recognized as a key factor in sustaining habitat (SNN 1990). A strong preference for living pines as foraging substrate has been demonstrated. Their most striking habitat requirement is that of mature living pines for cavity excavation (NATURESERVE). Cavities are excavated almost exclusively in living pine trees that are generally at least 70-years old (Hooper et al. 1980, Hooper 1982, Patterson and Robertson 1983). The almost exclusive use of living trees may reflect an evolutionary response to a situation where frequent fires reduced the abundance of standing dead trees (Jackson 1971). No other woodpecker demonstrates such strict requirements for nest or roost sites (Ligon 1970, Lay 1973, Harlow 1983), and habitat conditions that are suitable in every other way may not be occupied owing to an absence of cavities (Walters 1991). It takes many months, and often longer than a year, to excavate a cavity (Hooper et al. 1980, Walters 1991). The difficulty of cavity excavation is offset by the persistence of the cavity (Lay and Russell 1970, Jackson 1978a). Trees infected with red heart fungus are often selected, presumably because excavation is easier if the heartwood is rotten, and these are usually the oldest trees in the forest. Longleaf cavity trees usually average around 100 yrs. Of age, but, in the NC Sandhills, where older trees exist , many cavity trees are more than 200 years old. Similar ages have been reported for shortleaf and pond pine, whereas cavity trees average about 20 yrs. Younger in the faster growing slash and loblolly pines. They have consistently shown a preference for the oldest trees available in both foraging and cavity excavation, but because old-growth pine is so uncommon in the south today, it has not been possible to determine the ideal age of trees or habitat.

In Kentucky, basal area of active colonies was 48% pine and 52% nonpine (chiefly oak); hardwood abundance (88% of total stems) was much higher than recorded in habitat elsewhere (Kalisz and Boettcher 1991). Encroachment of hardwood midstory negatively impacts habitat. In eastern Texas, loss of forest habitat and fragmentation negatively affected woodpecker group size in small populations that had relatively isolated clusters of cavity trees, apparently by causing an insufficiency of foraging habitat and dispersal-demographic problems (Conner and Rudolph 1991, which see for contrasting results from another study).

In eastern Texas, bark beetles (54%), wind snap (30%), and fire (7%) were the major causes of cavity tree mortality; in Angelina National Forest, cavity enlargement by pileated woodpeckers was a significant factor in cavity loss for red-cockaded woodpeckers (Conner et al. 1991). In Texas, woodpeckers preferentially selected the oldest trees for cavity excavation; the current average age of cavity trees (85-130 years) may not provide optimum conditions (optimum may be represented by older trees that are not yet available) (Rudolph and Conner 1991); older/larger trees allow placement of cavities at a greater height, which reduces predation, fire damage, and girdling damage by woodpeckers. A moderate population occurs in the Sandhills, and several small populations are found in the southern Coastal Plain. Only scattered, relict populations remain in the northern Coastal Plain and Piedmont. The four largest populations in NC

(Sandhills, Camp Lejeune, Croatan National Forest, and Sunny Point Military Ocean Terminal) contained approx. 535 groups and 1300 adult birds in 1988. It is unlikely that there are more than 50 additional groups of woodpeckers (120 adults) elsewhere in the state. . Endemic to the southern US. Currently undergoing a range contraction due to loss of habitat. In the NC Sandhills there was apparently a significant decline in the mid-to-late 1970's. Many colonies in this region are now abandoned. There was a further decline of 16% in the number of groups between 1981 and 1983, and this was followed by a period of gradual decline of 3% / year through 1985.

Red-cockated woodpeckers forage on artjropods and some mast. A common foraging technique is to fip pine bark scales (often dislodging them) to prey on arthropods beneath the scales (Jackson 1992). They have beed reprted to forage in corn fields for corn earworms, also fruits of Prunus serotina, wax myrtle, magnolia grandiflora, Toxicodendron radicans, and swamp black gum, occasionaly forages on hardwood trunks (Stevenson and Anderson 1994).

Each member of a group usually has an exclusive roost cavity, although two nonbreeding birds sometimes briefly share a cavity (Hooper and Lennartz 1983b, Harris and Jerauld 1983, Jansen 1983). As many as 30 cavities may exist in a cluster of cavity trees (Hooper et al. 1980, Ligon et al. 1986), but the average number is usually less than six (Shapiro 1983, Hovis and Labisky 1985). Birds may roost under a limb or other protected site aswell (Jackson 1994).

Access to a cavity is important for roosting purposes, and it is critical to the nesting success of males (Ligon 1970, Hooper and Lennartz 1983). The nesting cavity is almost always the cavity of the single breeding male (Ligon 1970, Hooper and Lennartz 1983). ^The importance of attaining a cavity, contrasted with the extended time required to excavate a cavity, has led (in part) to different strategies among young birds for coping with the common situation wherein most suitable cavities are occupied by conspecifics (Walters 1990). One strategy is to disperse to an unoccupied area and begin excavating a new cavity, but this strategy is very rarely followed (Walters 1990). In eight years of study, Walters (1990) reported no instance of this "pioneering" behavior, although it has been reported elsewhere (Hooper, pers. Comm., in James, in press). Another strategy is to disperse from a natal territory and attempt to find a cavity (or attain breeding status) with a new group. This strategy is employed by almost all young females and by most (about 73%) young males (Walters et al. 1988). Yet another strategy is to remain on the natal territory in hopes of inheriting the natal territory or another nearby territory. This strategy is employed by 27% of the young males and less than 1% of young females (Walters et al. 1988). ^Birds that remain in natal territories may do so for many years and assist (i.e., "help") the breeding pair raise and care for new birds (Walters et al. 1988). The reason that almost all helpers are males may relate to their slightly closer genetic relationship, on average, with siblings (Wade 1979), or to their apparent dominance over young females (Jackson 1983a). The retention of young birds within their natal group is believed to be the most common pathway to a cooperative breeding system (Koening and Pitelka 1981). ^Once a male attains breeding status in a group, it usually retains that position until death. Females may switch groups after attaining breeding status, particularly when an offspring male inherits a territory (Walters et al. 1989). This behavior may help to avoid close inbreeding (Walters et al. 1989). ^In short, because of the time and energy required to construct a cavity, established territories with cavities are heavily preferred over areas with appropriate habitat conditions yet lacking cavities (Walters 1990). The presence of suitable cavities can lead some birds to occupy and defend an area that has unsuitable habitat conditions. Males acquire breeding position through inheritance of a natal territory, by dispersing and joining another group and inheriting the new territory, by dispersing and displacing another male, or by locating an unoccupied cavity cluster and attracting a unmated female.

Contiguous Patch Minimum Size (hectares): 40

Selected Map Units:

Functional Group	Map Unit Name
Forest/Woodland	Atlantic Coastal Plain Fall-Line Sandhills Longleaf Pine Woodland - Loblolly Modifier
Forest/Woodland	Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland - Open Understory Modifier
Forest/Woodland	Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland - Scrub/Shrub Understory Modifier
Forest/Woodland	Atlantic Coastal Plain Upland Longleaf Pine Woodland
Forest/Woodland	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest - Pine Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland - Loblolly Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland - Open Understory Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland - Scrub/Shrub Modifier

Forest/Woodland	Florida Longleaf Pine Sandhill - Open Understory Modifier
Forest/Woodland	Florida Longleaf Pine Sandhill - Scrub/Shrub Understory Modifier
Forest/Woodland	Southeastern Interior Longleaf Pine Woodland
Wetlands	Atlantic Coastal Plain Northern Wet Longleaf Pine Savanna and Flatwoods
Wetlands	Atlantic Coastal Plain Southern Wet Pine Savanna and Flatwoods
Wetlands	East Gulf Coastal Plain Near-Coast Pine Flatwoods - Open Understory Modifier
Wetlands	East Gulf Coastal Plain Near-Coast Pine Flatwoods - Scrub/Shrub Understory Modifier

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