2001

Red-cockaded Woodpecker status assessment for Tapoco Project Lands FERC No

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The Center for Conservation Biology

Recommended Citation

Bradshaw, D. S. 2001. Red-cockaded Woodpecker status assessment for Tapoco Project Lands FERC No. 2169. CCBTR-01-03. Center for Conservation Biology Technical Report Series. College of William and Mary, Williamsburg, VA. 20 pp.

Red-cockaded Woodpecker
Status Assessment for Tapoco Project Lands
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Recommended Citation:

Bradshaw, D.S . 2001. Red-cockaded Woodpecker Status Assessment for Tapoco Project Lands FERC No. 2169. Center for Conservation Biology Research Report Series, CCBR-01-05. College of William and Mary, Williamsburg, VA.

Prepared for:

Tapoco Division
Alcoa Power Generating Inc.

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EXECUTIVE SUMMARY

As part of the federal relicensing for the Tapoco Project, the Tapoco Division of Alcoa Power Generating Inc. contracted a survey for the endangered Red-cockaded Woodpecker on Project lands in east Tennessee and southwest North Carolina. The survey was conducted during the early spring of 2001 to maximize opportunity for detecting birds during the early portion of the breeding season. Surveys made use of targeted and transect searches as well as tape playbacks of Red-cockaded Woodpecker vocalizations. Taped vocalizations were broadcast over 400 times across more than 700 hectares of suitable or potentially suitable habitat. Over half of that area was also intensively searched on foot where the possibility of nest cavities was considered highest. No evidence of Red-cockaded Woodpeckers was detected, either of past or present activity. Wide scale mortality of old growth trees from beetle infestation and unmanaged hardwood midstories appeared the most likely causes of the species disappearance.

INTRODUCTION

I. Background

In 1998, the Tapoco Division of Alcoa Power Generating Inc. began efforts to secure federal relicensing for its Tapoco Hydroelectric Project (FERC No. 2169). One component of that effort involved ensuring that licensed operations would not adversely affect state or federal protected wildlife or plant species. An initial survey was completed by The Tennessee Chapter of The Nature Conservancy in 1999 to evaluate the status and distribution of any such listed species. Although no Red-cockaded Woodpeckers (*Picoides borealis*) were observed, the survey documented habitat of suitable quality and quantity to support this federally endangered species. The survey also revealed that the species was known to have occurred within close proximity to Tapoco Project lands. As a result, a specific survey was requested to investigate the current status and distribution of that species on, and in proximity to, the Project area.

II. Project Site Description

The Tapoco Project study area is located within portions of Graham and Swain Counties in North Carolina, and Blount and Monroe Counties in Tennessee. Project lands are situated primarily within the western edge of the Blue Ridge physiographic province, in the foothills of the Unaka Mountains. Federal lands surround the property for the most part, with portions of the Great Smoky Mountains National Park, the Cherokee National Forest, and the Nantahala National Forest bordering the Tapoco Project lands (Figures 1-3) Much of the terrain is extremely rugged and heavily forested. Elevations range from approximately 250 to 760 meters above sea level, although surrounding mountains can reach elevations of 900 to over 1200 meters. The landscape varies from rolling uplands to steep ravines and cliffs. Mixed pine stands of shortleaf, Virginia, and Pitch Pines are generally distributed along the drier positions of upper southerly slopes and ridge tops, or disturbed areas. This favors use by Red-cockaded Woodpeckers, by providing maximum sun exposure to their typically southwesterly to westerly facing cavities.

The study area related to the re-licensing effort includes all hydroelectric production and transmission areas designated by the Federal Energy Regulatory Commission as part of the FERC Project Boundary as well as lands within 61 m (200 ft) of reservoir shorelines, 15 m (50 ft) to each side of transmission lines/pipeline right-of-ways, and within 30 m (100 ft) of the center line of the Cheoah River (Figures 1-3). Because of the special interest in Red-cockaded Woodpeckers by the adjacent federal landowners and oversight agencies, in conjunction with the protective boundaries that accompany habitats of endangered species, an effort was made to focus this study only on survey areas important to this effort, which ultimately included the addition of some areas outside the originally defined study area. This required collaboration with federal authorities to ensure adequate survey treatment of areas within reasonable proximity of Tapoco Project lands.

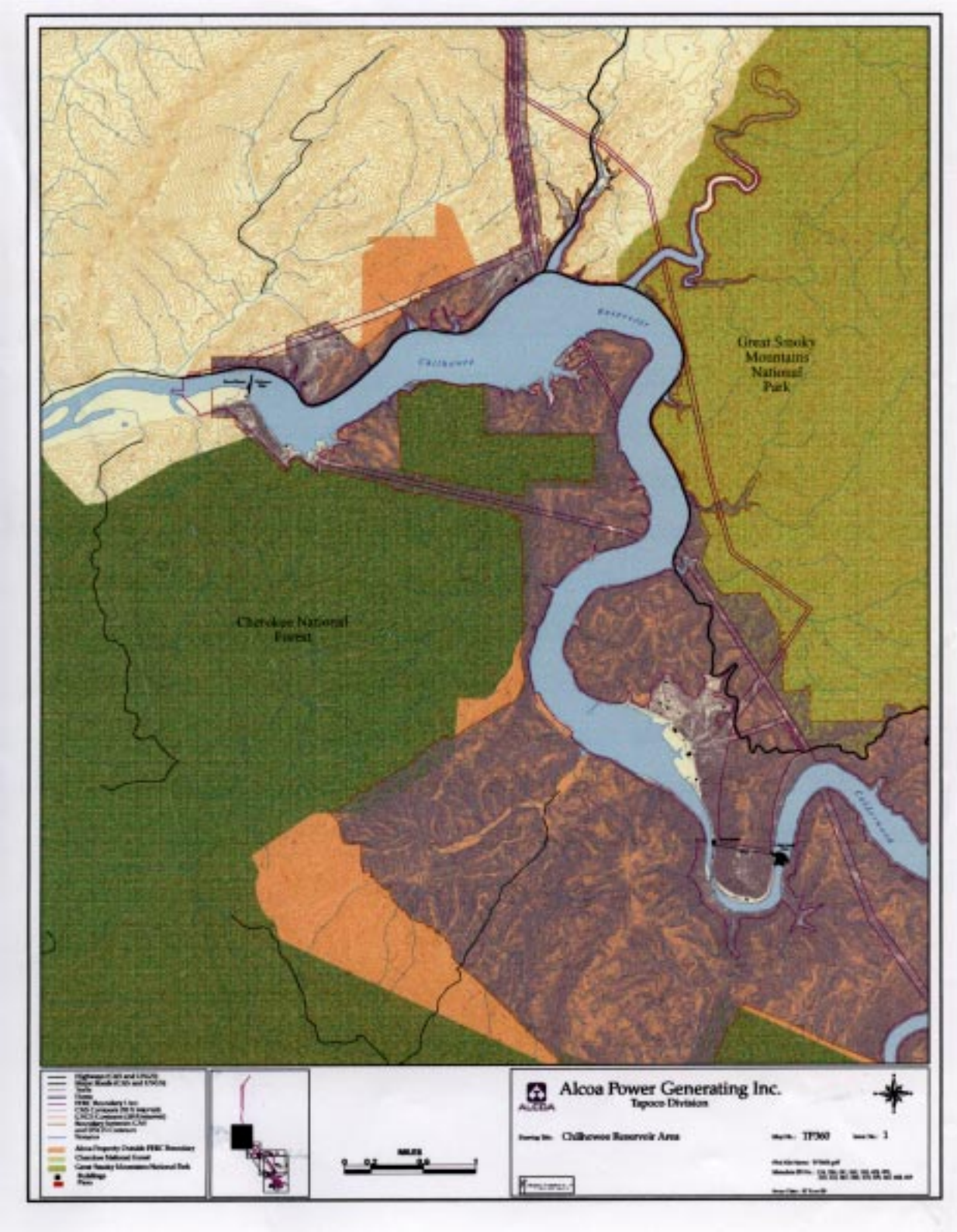

Figure 1. Northwest portion of Tapoco Project area beginning at Chilhowee Dam. Not shown is the continuation of the transmission line corridor extending north through Blount County.

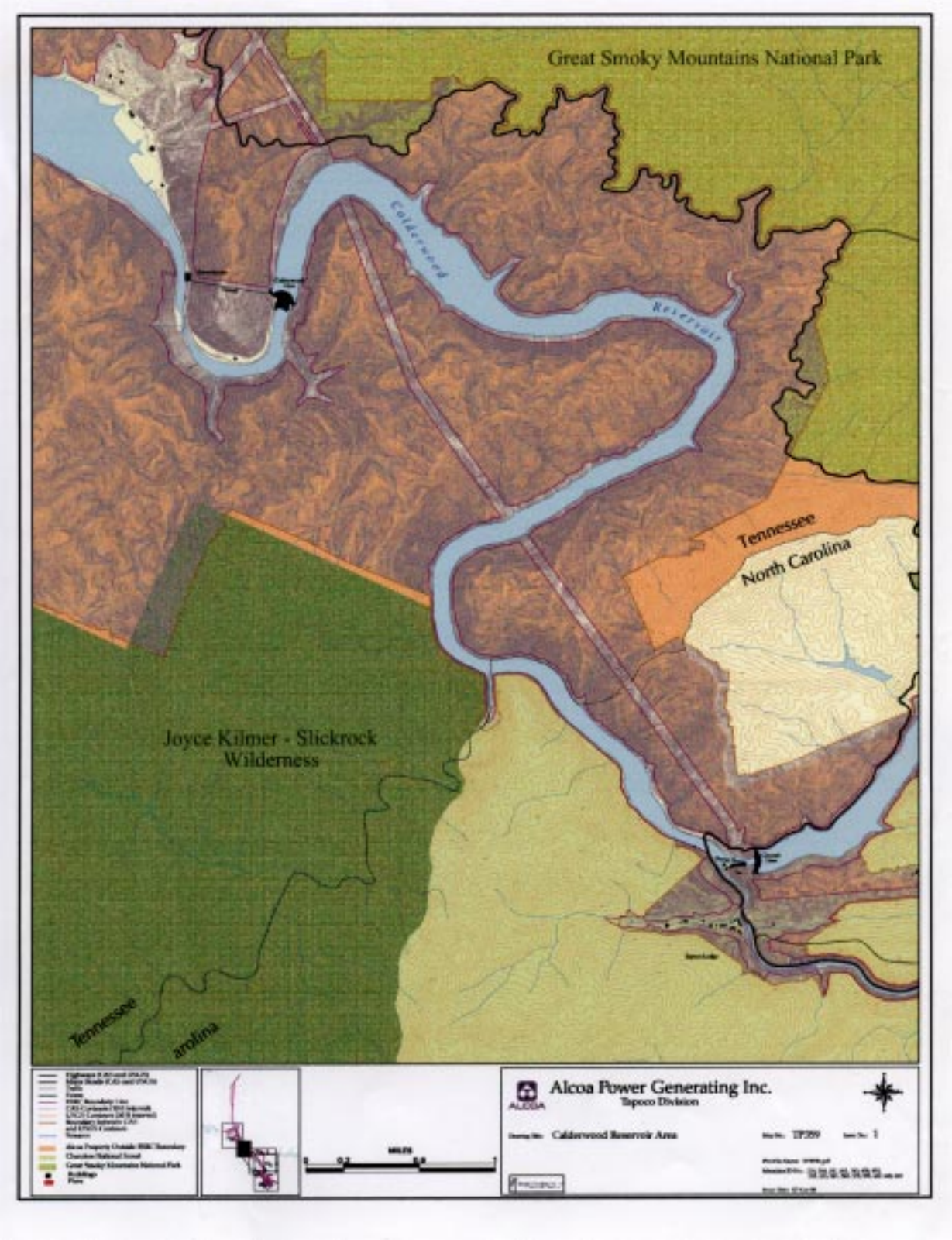

Figure 2. Central portion of the Project area from Calderwood Dam to Cheoah Dam .

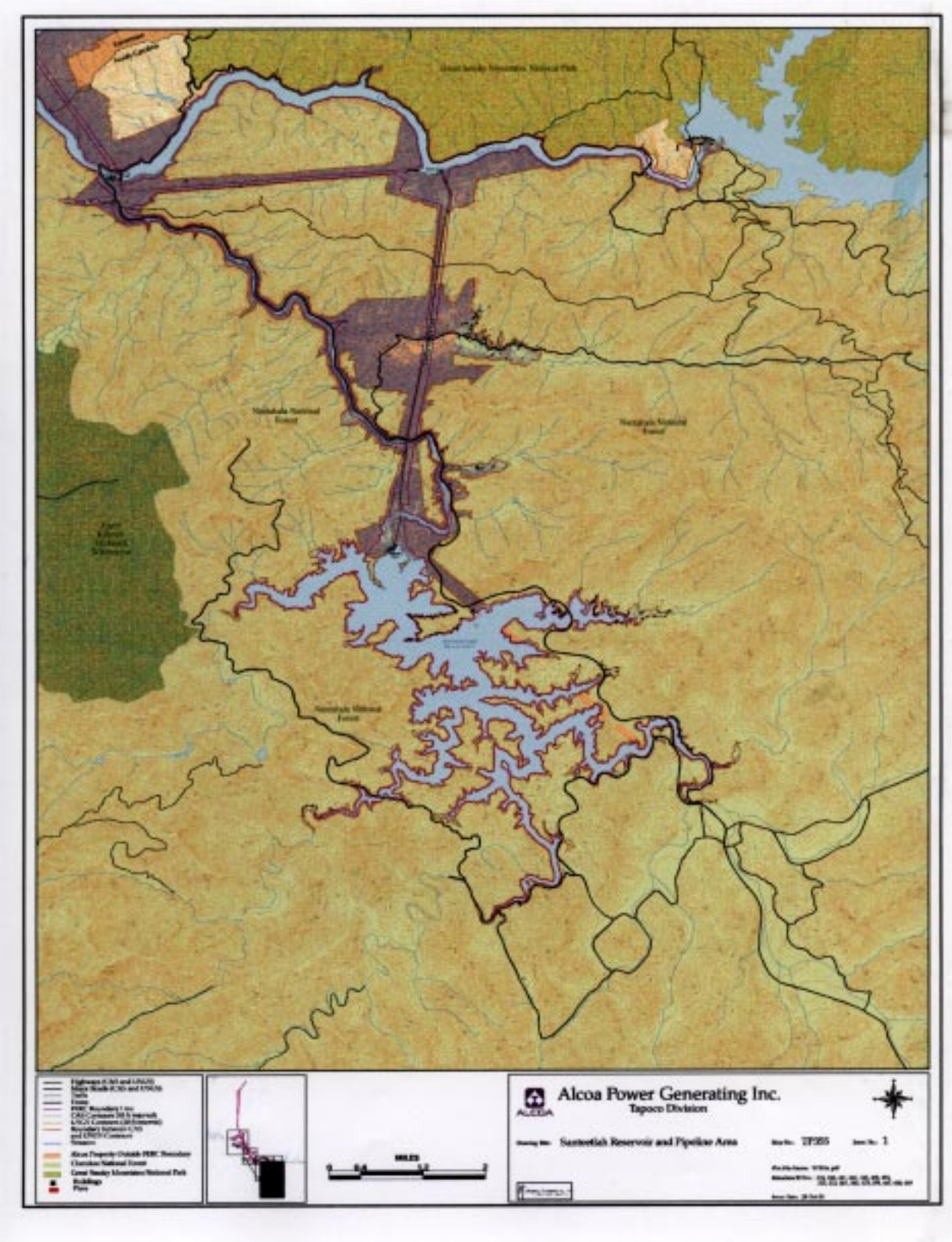

Figure 3. Southern end of Project Area including Little Tennessee River reach from Cheoah Dam to Fontana Dam and Cheoah River reach from Little Tennessee River to Santeetlah Lake.

III. Species Profile

Red-cockaded Woodpeckers are so named for the tiny sliver of red hidden on the males between their broad white cheek patch and black crown. Physically, they are otherwise unremarkable, yet they have a very specialized ecology. The species depends on pine forests for foraging and nesting, specifically requiring old-growth stands from which to select trees suitable for cavity excavation. They have a complex social structure characterized by family "groups" which comprise a breeding pair as well as up to several young from previous years which serve as "helpers" in the brood rearing process. Each bird requires its own cavity in which to roost year-round, and the collection of roost trees that harbor a group is referred to as a "cluster". The most diagnostic clue for identification of the species is the candled appearance of their cavity trees caused by dried resin flowing from small wells in the bark. The birds spend a great deal of time creating and maintaining these resin wells around their cavities. It is thought the sticky resin serves to impede or inhibit potential nest predators.

Red-cockaded Woodpeckers were formerly resident in the southeastern Piedmont and Coastal Plain from New Jersey through the southeastern states to Texas and Oklahoma. In addition, there were birds known to occupy more mountainous habitats through the Appalachians from north Georgia and Alabama up through eastern Tennessee, Kentucky and southwestern Virginia. There has never been evidence linking these birds across a continuum of habitat to the historic populations of the Coastal Plain and eastern Piedmont of the southeast. Whatever the cause for this distribution pattern, there does exist evidence of the species having historically occurred near the Project area (Figure 4).

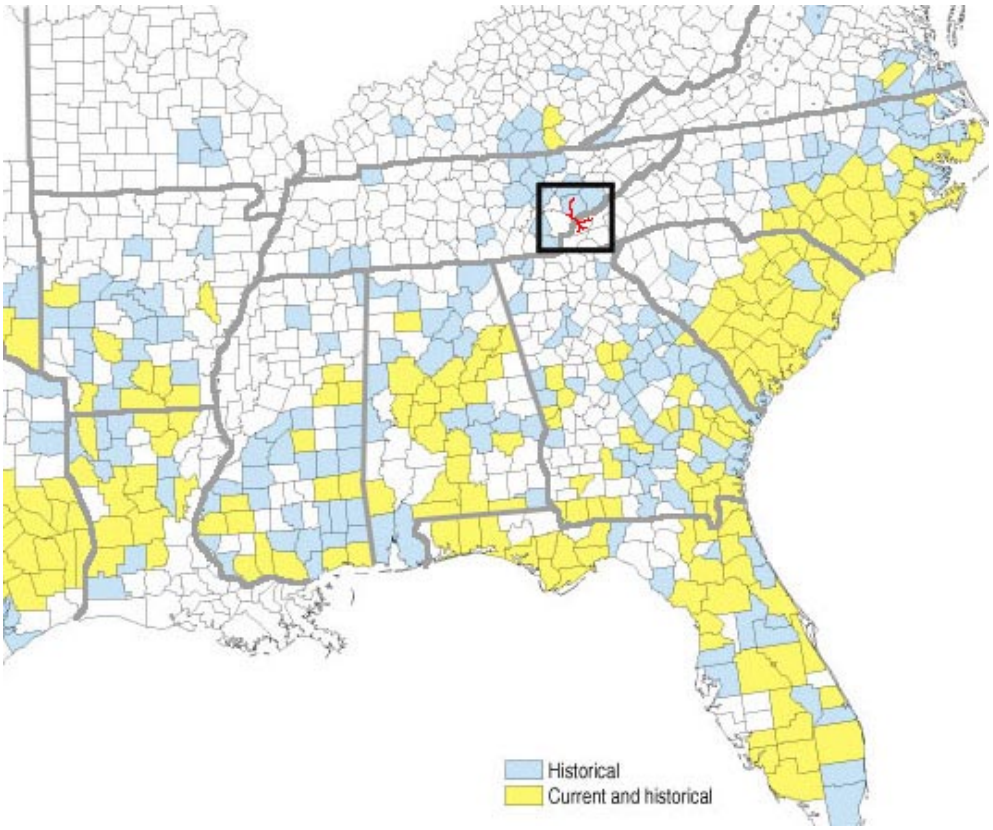

Figure 4. Distribution map for Red-cockaded Woodpecker past and present. Project Area shown in red within black box. *Modified from Costa, R. and J. Walker. 2000.*

There have been published reports of Red-cockaded Woodpeckers in Tennessee since the mid-1880's, spanning at least 11 different counties (Nicholson, C. 1977). In the last quarter century, Nicholson notes that the distribution has dwindled to 4 counties, most closely aligned along the escarpment where the Cumberland Plateau meets the Blue Ridge physiographic region. Of the last 4 counties of record, the most recent location was in the late 1980's in the Blount County portion of Great Smoky Mountains National Park (Park) (Cantrell, M. pers.comm). There still remains historic evidence of Red-cockaded Woodpecker presence on Park property less than one kilometer from Tapoco Project lands (Figure 5).

Probably the most detailed analysis of mountainous RCW habitat has been in the Daniel Boone National Forest in southeastern Kentucky. Kalisz and Boettcher (1991) found ninety percent of cavity trees were located on the tops or shoulders of ridges with slopes as great as 43%. Shortleaf Pine (*Pinus echinata*, Virginia Pine (*P. virginiana*), and Pitch Pines (*P. rigida*) accounted for 61, 26, and 13% of the cavity trees respectively. Evaluation of micro-site characteristics showed that although the site was dominated by hardwood stems, pine trees were typically situated near openings, or thinned areas within the stands, or on ridge tops. These characteristics mirror closely the species assemblages and landscape characteristics of the Tapoco Project area and nearby Great Smoky Mountains National Park.

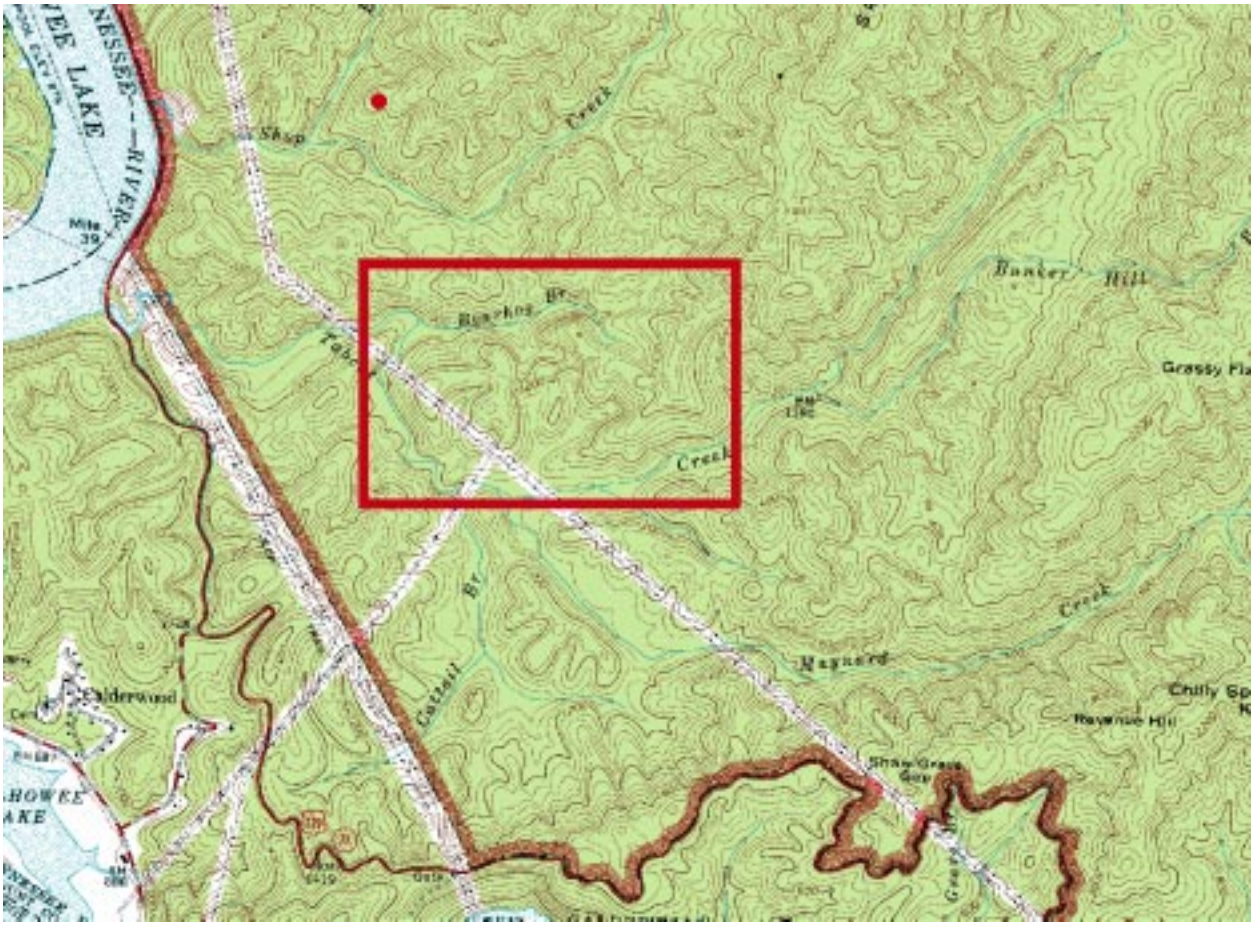

Figure 5. Red polygon contains area of last known locations for Red-cockaded Woodpeckers in Great Smoky Mountains National Park.

METHODS

An initial visit was made to the historical Red-cockaded Woodpecker site in the Park to assess overall site conditions and terrain features. With this information, color infra-red aerial photography at a scale of 1:10,000 was used to evaluate the land cover of the Project Area for habitat suitability. A series of USGS 7.5 minute topographic maps for the area was then annotated with search boundaries indicating suitable habitat for Red-cockaded Woodpeckers based on photo interpretation.

A two person survey team was used to search all suitable sites on the ground as identified from the aerial imagery. Search methodology was variable depending on terrain. One observer utilized a transect survey of parallel lines where terrain was favorable, or used a series of switchbacks up and down ridges to afford views of all pine trees of adequate size or age. The second observer was dedicated to using a modified point count technique in conjunction with vocalization playbacks for the target species. A portable CD player with an attached hand held amplifier was used to broadcast a six-minute routine of playbacks and silence. Two minutes of continuous Red-cockaded Woodpecker vocalizations were broadcast; followed by a one-minute period of silence, then another two minutes of playbacks followed by a final minute of listening. This routine was executed at every peak, overlook, and clearing; or randomly, not to exceed 200 meters in distance between events. The recorded vocalizations were comprised of segments containing greeting calls, flight calls, and antagonistic or alarm calls, and were broadcast at a decibel level well above that capable by a woodpecker.

RESULTS

I. First Survey

A first survey was undertaken in early February to evaluate the results of the aerial photography interpretation, and to establish baseline data on survey efficiency and time allocation. The most important revelation was that our photo interpretation contained a significant bias toward White Pine (*Pinus strobes*) and Eastern Hemlock (*Tsuga canadensis*) – two species unutilized by Red-cockaded Woodpeckers. White Pines tend to produce branches from the ground up which would inhibit cavity excavation as well as foraging by Red-cockaded Woodpeckers. Hemlocks have bark that is not conducive to prying off, and also tend to branch out almost to the ground. Both of these trees yielded bold conifer signatures on the aerial imagery and were subsequently mistaken for mature stands of the more suitable pine species.

The second important observation from this survey was the distinct association between habitat suitability and habitat location. Conforming to the findings of Kalisz and Boettcher (1991), the most suitable habitat tended to be high on the slope of a ridge, or on the ridge top. There was also a distinct bias toward south or southwesterly facing slopes. This also corresponds with the warmer and drier position on the slope as would be expected. Conversely, the northerly facing slopes tended to be cooler and wetter, and therefore more likely to be characterized by a predominantly White Pine or hemlock component.

No cavity trees or Red-cockaded Woodpecker evidence of any kind was discovered during the initial survey in February. The tape playbacks were deployed over 50 times in 10 different habitat blocks, and over 100 hectares of trees were examined for evidence.

II. Second Survey

The second survey was undertaken during the first two weeks in April. This was designed to coincide with the peak response time for territorial birds entering the breeding season. Tape recorded playbacks of the calls of con-specifics should illicit prompt and aggressive responses from other birds in the area. The aerial imagery had also been completely re-evaluated for this survey based on the revised habitat signature after discounting White Pine and hemlock.

Tape playbacks were used over 150 times, broadcasting Red-cockaded Woodpecker vocalizations over more than 600 hectares. Over 365 ha were searched on foot where habitat was deemed suitable. The historical site in the Park was searched in great detail. Near that area one questionable tree was located. The tree was positioned halfway between the fork in Shop Creek and the 488 m. contour line on the ridge crest as it rises to the peak of Shop Ridge. The position is indicated with a red dot on Figure 5. It was a mature Pitch Pine, approximately 18 m tall, with a cavity at 10 m. The cavity was seated on bare sapwood, with bark removed from a one square foot area around it. There were numerous vertical slits in the bark above and below the cavity prompting a light flow of resin, mostly confined to the first foot from the slit. At first glance, the cavity was reminiscent of Red-cockaded Woodpecker work. However, the cavity plate was not rounded at all, nor did it have the tapered and beveled edges of a Red-cockaded Woodpecker's bill work. The resin wells also were not appropriate for the target species. The vertical slits were roughly hewn, non-symmetrical, and deep; characteristic of the work of a Pileated Woodpecker (*Dryocopus pileatus*). The apparent plate around the cavity was most likely the result of a falling branch or other self-sustained injury. There was no evidence other than the live tree to suggest involvement by a Red-cockaded Woodpecker.

A second cavity was discovered in a live Pitch Pine on the lower slopes between Shaw Grave Gap and Revenue Hill just off Rt. 129 on the Calderwood Quadrangle. This cavity clearly bore the signature of Pileated Woodpecker work. The cavity was oval at the bottom, but squared off on the sides and top. It measured an estimated 9 to 10 cm in height and nearly 7.5 cm wide at the top. The bark was roughly hewn around the edges and across the top. There was no evidence of resin wells of any type, or any kind of plate around the cavity, but there were a few feeding holes where large gouges had been ripped in the bark by the bills of Pileateds.

One critical point emerged from the second survey to overshadow all others. Evidence of pine beetle (*Ips. sp*) mortality was rampant throughout all the old growth habitat . The historic site, on the south end of Skunk Ridge, has all but succumbed to beetles (Figures 5 & 6). Both of the last two remaining cavity trees are on the ground, and virtually every old growth pine on the adjacent ridges is experiencing some degree of beetle infestation, or already dead. Many of the very best habitat stands for old growth pines were completed decimated. This was especially true on Park property between Shop Creek and the North Carolina state line. The only places that

healthy stands of old growth pines were encountered were typically on low slopes or near creeks, in which cases they usually shared the canopy with hardwoods, and harbored a dense hardwood mid-story component.

Figure 6. South end of Skunk Ridge comprising part of stand that contained last remaining RCW cavity trees in the Park. Most older trees are dead or dying from pine beetle infestation.

Very little habitat was surveyed on the south side of the Little Tennessee River. Observers made entry into several habitat blocks on that side of the river but the north facing slopes delivered forest stands dominated by White Pine and hemlock. Virginia Pine appeared to be common in areas on the south side as well, but these stands rarely reached “old growth” before being harvested.

The survey effort was concluded after 10 days in the field. No evidence of Red-cockaded Woodpeckers was discovered. Following is a detailed list of all areas that were searched on foot, with a brief site evaluation. Sites are listed according to the USGS topographic map they are shown on relative to the Project Area map (Figure 7).

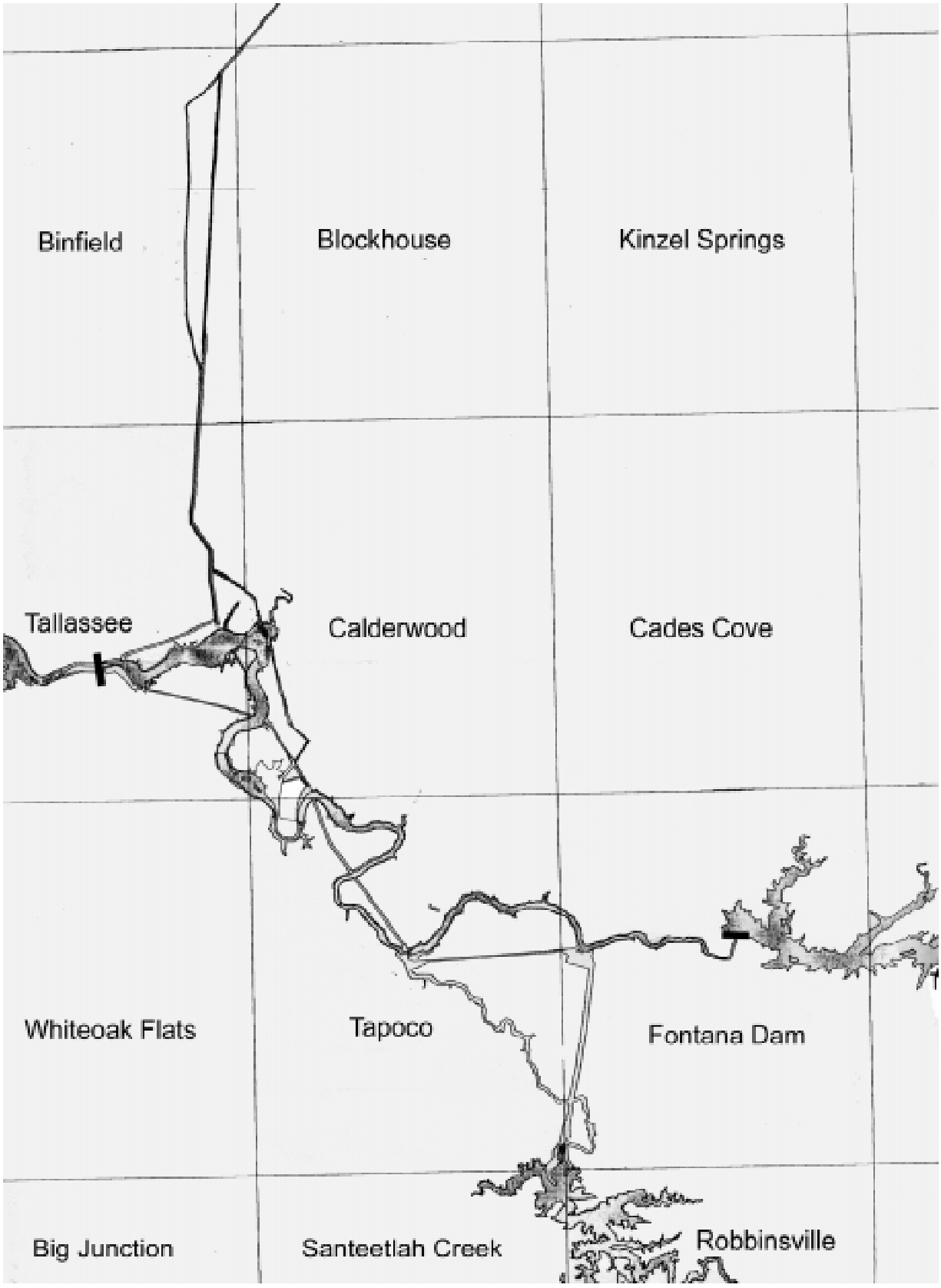

Figure 7. Project Area map key to 7.5 minute USGS topographic quadrangles.

List of Sites Surveyed

A. Sites along and adjacent to the transmission line corridor across Little Mountain at Hardwood Gap and adjacent to Foothills Pkwy at Shorthall Gap on Shingle Mountain (Tallassee Quad) (Figure 8). Habitat too young for the most part, or too much White Pine.

B. Three sites on north side of Chilhowee Lake between Stratton Knob and entrance to Foothills Pkwy (Tallassee Quad) (Figure 8). Good habitat, but too young for nest trees.

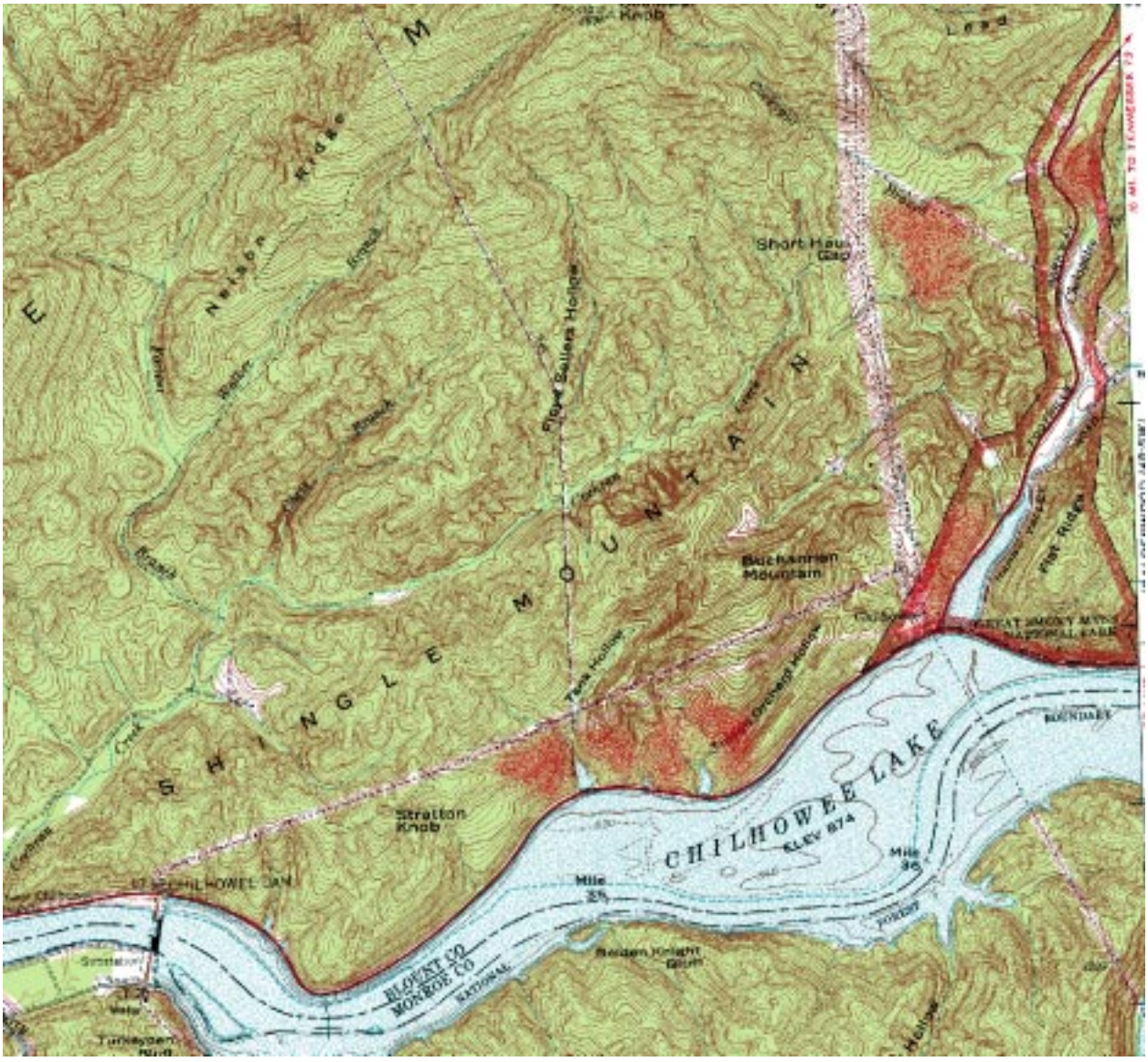

Figure 8. Eastern portion of Tallassee Quadrangle showing surveyed sites in red layer.

C. All sites along, and within 1 km of, each transmission line corridor on the north side of Chilhowee Reservoir on the southwest portion of Calderwood Quad. This includes the historical site and all ridges associated with Panther, Shop, Tabcat, and Maynard Creeks, along with Blacksmith Branch and Parson's Branch (Figure 9). The area surveyed on foot totaled approximately 400 hectares. This was the only location of consistently good habitat, although most of it was in the early to mid-stages of succumbing to pine beetles.

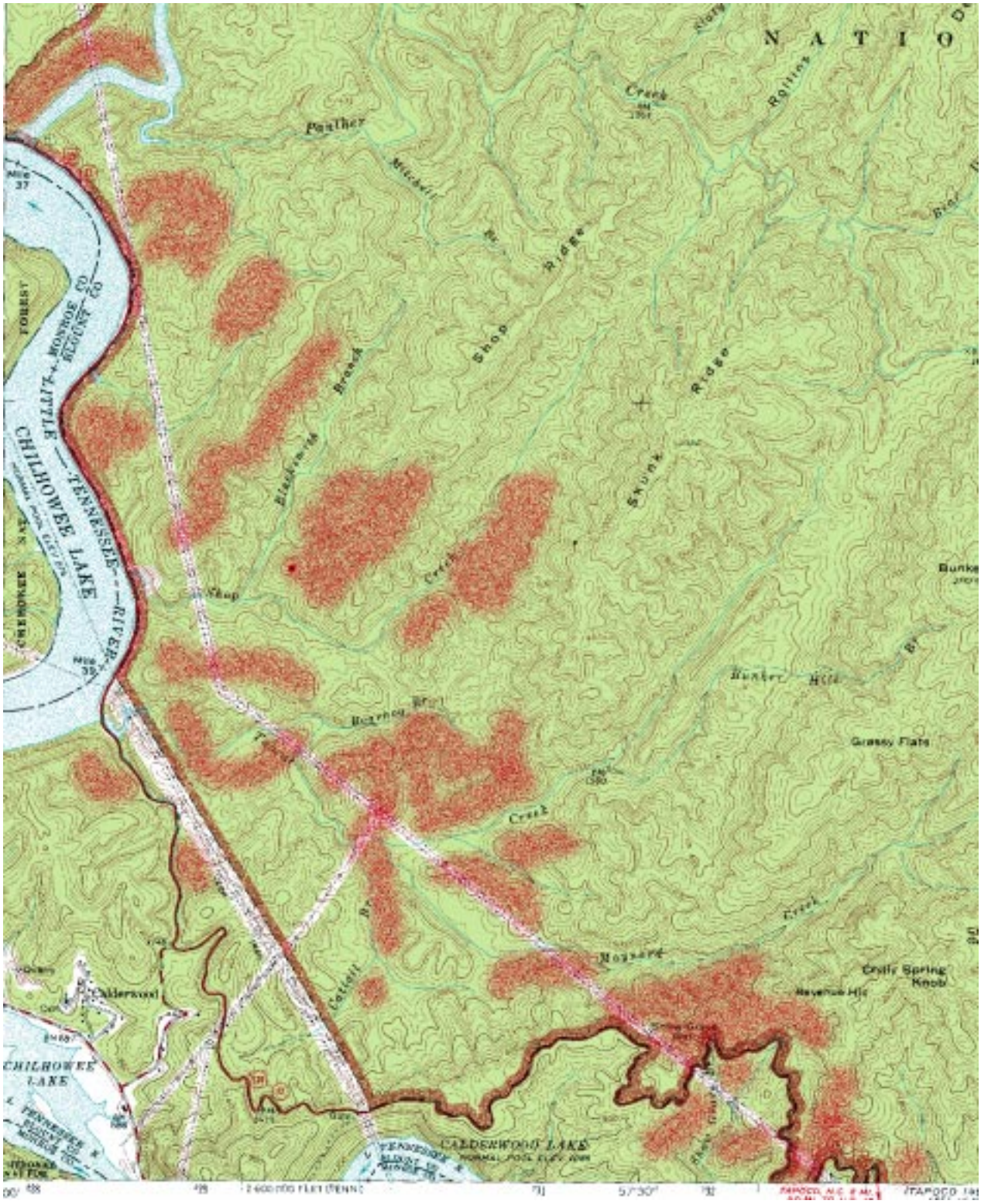

Figure 9. Surveyed areas in southwest portion of Calderwood Quadrangle. This area comprises the most recent historical RCW site within the Park, and the most proximite site to the Project Area.

D. All sites along, and within 1 km of, each transmission line corridor north of the Little Tennessee River on the NW quadrant of the Tapoco Quad (Figure 10). This totaled approximately 120 ha of foot surveys. Habitat composition still good in places, but overall age of stands younger as distance from Park increases, leaving smaller and more disparate stands of good quality habitat.

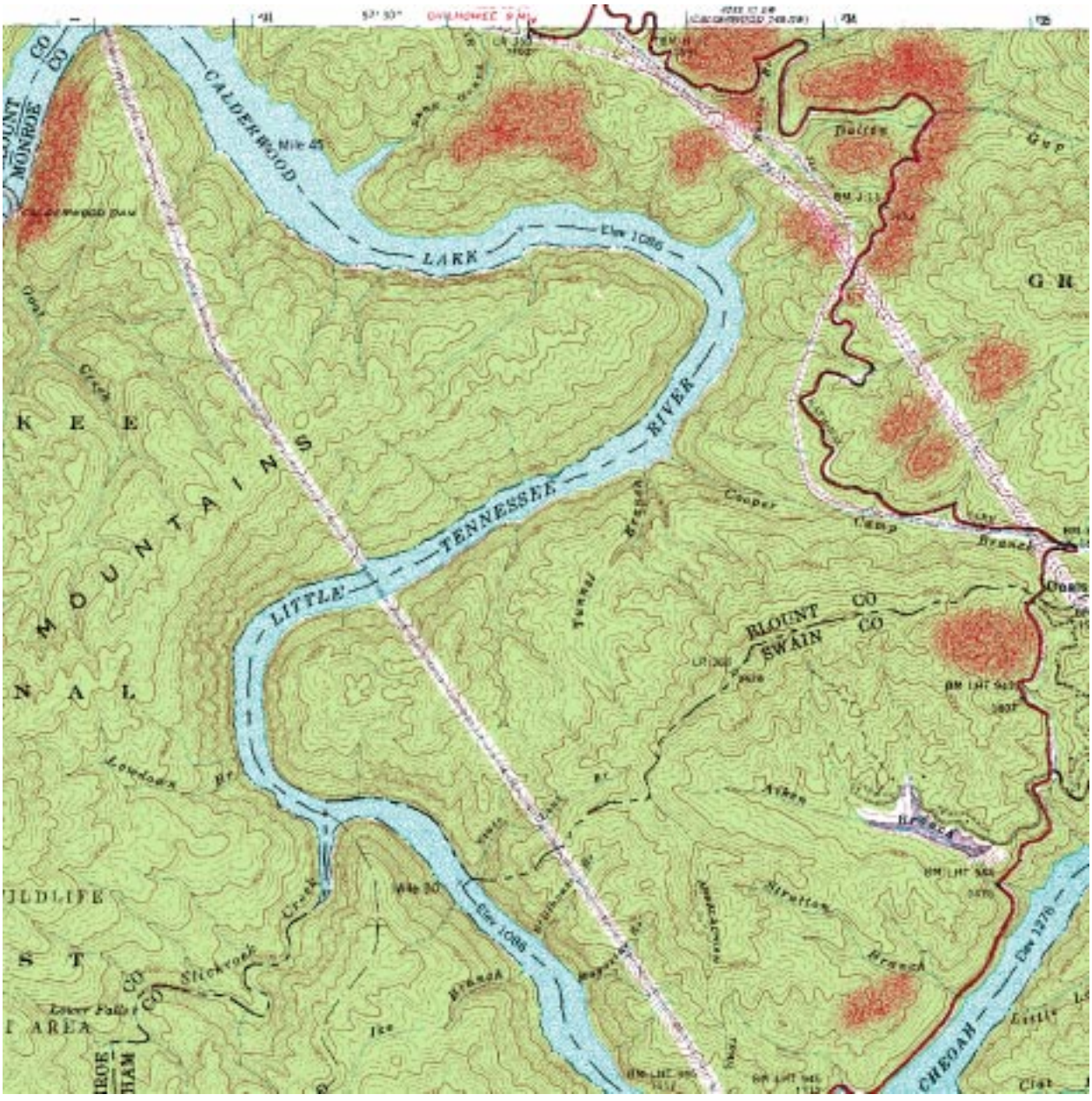

Figure 10. Surveyed areas on northwest portion of Tapoco Quadrangle.

E. Three sites on north side of Little Tennessee River adjacent to transmission line corridor that runs to Fontana Dam. These sites were within 3 km of the dam on the northern half of Fontana Dam Quadrangle (Figure 11). The stands were of suitable age but too sporadic and disjointed from other suitable habitat to support birds.

Figure 11. Surveyed sites on Fontana Dam Quadrangle.

F. On the south side of the Little Tennessee River surveys were conducted in only three areas: 1) across the river from the Calderwood Dam 2) and two locations just off Fork Ridge 3 km east of the junction of Rt. 129 and 28 in Swain County, NC. (Tapoco Quad – NE). This habitat was significantly different in most areas from the north side of the river. Ridges were primarily north facing, and therefore cooler and wetter, predisposing them to greater degree of White Pine and Hemlock. The pure pine stands were primarily Virginia Pine but too small to be suitable for RCWs. Sporadic Shortleaf and Pitch Pine stands were too small or already decimated by Pine beetles.

G. Numerous sites were also surveyed along both sides of the Cheoah River and Rt. 129 south to Santeetlah Lake, as well as around Santeetlah Lake proper. This southern end of the project area was dominated by White Pine with only poorer quality stands of the other pines available.

DISCUSSION

With the increase in public recreation demands and forest aesthetics, as with modern timber management, fire suppression has become the management practice of choice. And with this choice has followed the demise of Red-cockaded Woodpeckers; a species dependent on open, old-growth pine forests. The species presence in the southern Appalachians has probably always been tenuous, and therefore, potentially more susceptible to local extirpations. This appears to be the case with Red-cockaded Woodpeckers that were historically associated with the Tapoco Project Area.

Although the Park had initiated several controlled burns to control the midstory hardwood component at the historic site, this may also have ultimately had detrimental effects on the habitat. Stressed trees are prime targets for beetle infestation, and the burned sites within the Park were among the most seriously damaged by beetles of the sites surveyed. This must also be viewed in the greater context of the surrounding counties and states. Nineteen ninety eight began a record pine beetle outbreak in Tennessee and Kentucky that had been unrivaled since records were kept in the 1960's. Over 100,000 acres of pine trees had been killed in Tennessee alone as of May, 2001 excluding the Park (Kaufmann, B. 2001). In Kentucky, the native southern pine community had been essentially eliminated altogether (USFWS 2001) This mandated the capture and translocation of all Red-cockaded Woodpeckers from Kentucky, effectively nullifying years of effort to rebuild that population.

The absence of Red-cockaded Woodpeckers within the Project Area is not surprising. What were formally suitable older stands for cavity trees are predominantly dead or dying from beetle infestation. Where older trees still exist, they are typically in association with lower, more hardwood dominated sites with dense midstory habitats that would not be suitable for the woodpeckers. In this case, transmission line corridors may have actually served some benefit to the species by opening up dense stands and facilitating access to potential cavity trees along an edge. This is often seen in the supoptimal habitats of Virginia where Red-cockaded Woodpeckers have been pushed out of the forest interior by midstory encroachment. At any rate, there appears to be no evidence that the species still occupies lands associated with the Project Area. This includes transmission line corridors proper, as well as sites of suitable habitat deeper within the forest interior. Perhaps of greater significance to the southern Appalachian RCW population, is that this dramatic beetle outbreak may have also removed any hopes of historic sites ever being recolonized.

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APPENDIX 1. Birds detected on surveys.

February 2001 Survey

Ruffed Grouse	*Bonasa umbellus*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Pileated Woodpecker	*Dryocopus pileatus*
Eastern Phoebe	*Sayornis phoebe*
Eastern Tufted Titmouse	*Baeolophus bicolor*
Black-capped Chickadee	*Poecile atricapilla*
White-breasted Nuthatch	*Sitta carolinensis*
Carolina Wren	*Thryothorus ludovicianus*
Golden-crowned Kinglet	*Regulus satrapa*
Hermit Thrush	*Catharus guttatus*
Northern Cardinal	*Cardinalis cardinalis*
Dark-eyed Junco	*Junco hyemalis*

April 2001 Survey

Ruffed Grouse	*Bonasa umbellus*
Downy Woodpecker	*Picoides pubescens*
Northern Flicker	*Colaptes auratus*
Pileated Woodpecker	*Dryocopus pileatus*
Blue-headed Vireo	*Vireo solitarius*
Blue Jay	*Cyanocitta cristata*
Eastern Tufted Titmouse	*Baeolophus bicolor*
Carolina Chickadee	*Poecile carolinensis*
White-breasted Nuthatch	*Sitta carolinensis*
Carolina Wren	*Thryothorus ludovicianus*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Black-throated Green Warbler	*Dendroica virens*
Palm Warbler	*Dendroica palmarum*
Pine Warbler	*Dendroica pinus*
Yellow-throated Warbler	*Dendroica dominica*
Black and White Warbler	*Mniotilta varia*
Louisiana Waterthrush	*Seiurus motacilla*
Hooded Warbler	*Wilsonia citrina*
Eastern Towhee	*Pipilo erythrophthalmus*
Chipping Sparrow	*Spizella passerina*