RED-COCKADED WOODPECKERS IN THE GREAT SMOKY MOUNTAINS NATIONAL PARK: THEIR STATUS AND HABITAT

RESEARCH/RESOURCES MANAGEMENT REPORT No. 38

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
SOUTHEAST REGION

UPLANDS FIELD RESEARCH LABORATORY
GREAT SMOKY MOUNTAINS NATIONAL PARK
TWIN CREEKS AREA
GATLINBURG, TENNESSEE 37738

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Research/Resources Management Report No. 38

by

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November, 1980

This report represents a study funded and supported by the National Park Service, Uplands Field Research Laboratory, Great Smoky Mountains National Park.

U.S. Department of the Interior
National Park Service
Southeast Regional Office
Natural Science and Research Division
75 Spring Street, S.W.
Atlanta, Georgia 30303

Dimmick, Ralph W., Walter W. Dimmick and Craig Watson. 1980. Red-Cockaded Woodpeckers in the Great Smoky Mountains National Park: Their Status and Habitat. U.S. Department of the Interior, National Park Service, NPS-SER Research/Resources Management Report No. 38. 21 pp.

ABSTRACT

Red-cockaded woodpeckers (Picoides borealis) were studied in the southwestern portion of Great Smoky Mountains National Park (GSMNP) during May-July, 1979. Approximately 2000 ha of potential habitat were searched by cruising to detect the presence of the species. One clan was located, the colony site occurring at the extreme southwest end of Skunk Ridge at the 1200'·msl contour level. Three cavity trees were observed; 2 of these were not active. The active cavity was a Virginia pine (Pinus virginiana), and the inactive cavities were in a Virginia pine and Shortleaf pine (P. echinata). Suggested approaches for management include: (1) continue searching for additional colonies in the southwestern portion of GSMNP, (2) intensively manage the existing colony site by mechanical removal of hardwood mid-story and regeneration, (3) suppress fires immediately which threaten known colony sites, and (4) if fire management policy and on-site conditions permit, allow wild fires to burn areas with high probability for regenerating Virginia pine and/or Shortleaf pine.

ACKNOWLEDGMENTS

This work was supported by a grant from the Uplands Field Research Laboratory, National Park Service, at Great Smoky Mountains National Park. Partial support was received from the U.S. Forest Service, Southeast Regional Office. Facilities and secretarial services were provided by the University of Tennessee Agricultural Experiment Station. Mr. Fred Alsop contributed valuable information concerning red-cockaded woodpecker observations.

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Craig Watson - University of Tennessee, Knoxville

The red-cockaded woodpecker (Picoides borealis), primarily an inhabitant of mature pine (Pinus sp.) stands of the southeastern United States coastal plain, occurs in Tennessee in disjunct relict populations occupying pine or oak-pine associations in predominantly upland hardwood forests. Its rarity in Tennessee has generated a long-term interest among local ornithologists, resulting in several published and unpublished reports of the bird and/or its nest cavities. Its official designation by the U.S. Fish and Wildlife Service as an endangered species has enhanced this interest in its welfare. This designation has also required significant activity by state and federal governments to learn more of its ecology and distribution in order to conserve the bird and its habitat.

This study was undertaken to determine the present distribution and abundance of red-cockaded woodpeckers in Great Smoky Mountains National Park (GSMNP), and to evaluate the status of presently utilized and potential habitat for the species. Red-cockaded woodpeckers were first reported in the area presently encompassing the Great Smoky Mountains National Park by Fleetwood (1936); he observed birds at three locations in the southwestern region of GSMNP during 1935 (Fig. 1). All other reports of this species in GSMNP have been from this same region, though they have been widely scattered chronologically.

METHODS

The Study Area

The study area encompassed the southwestern portion of the Great Smoky Mountains National Park in Blount County, Tennessee (Fig. 1). The primary area searched for birds and cavity trees was bounded on the western side by U.S. 129, on the southern side by Parsons Branch Road, on the eastern side by Cooper Road, and on the north by Abrams Creek. Hannah Mountain, Arbutus Ridge, Crooked Arm, and Wedge Ridge lie partially or wholly outside these boundaries, but were also searched.

Elevations in the study area range from about 1200 to 3000 feet above mean sea level. Topography is steep and highly dissected. There is a northeast-southwest trend to many of the ridges, but other ridges run nearly perpendicular to this orientation. Numerous permanent streams drain the area, with secondary streams flowing into Abrams Creek or directly into Chilhowee Lake in the southwestern corner.

The study area is almost completely forested. Forest types are varied, ranging from hemlock (Tsuga canadensis) and yellow poplar (Liriodendron tulipifera) stands on the more mesic sites to oak-pine communities on the more xeric ridges. Almost all sites containing sufficient numbers of pine (Pinus echinata, P. rigida, P. virginiana) to constitute potential red-cockaded woodpecker habitat were located on ridge tops and upper slopes.

Searching for Cavity Trees

Selected areas within the study area were searched for cavity trees during the period 28 May - 29 June 1979. Intensive searches were conducted on those ridges and portions of ridges where red-cockaded woodpeckers had been reported previously, and on other areas where significant stands of

pine were reported to occur. The probable locations of pine stands were determined from information provided by Mark Harmon (personal communication, 1979) and from a 1953 vegetation map prepared by Miller. Searching was accomplished by a crew of two to four men walking 10 to 20 m apart. Ridge tops and south-facing upper slopes contained the most significant stands of pines, and consequently were searched most intensively. Pine stands comprised of mature trees with abundant evidence of redheart disease were scrutinized carefully. Individual trees with considerable resin exudate were closely examined.

Measuring Habitat Characteristics

Physical and biological characteristics were measured for 28 mature pine trees on the study area. Three of these trees contained red-cockaded woodpecker cavities; 25 were selected as "potential" cavity trees as indicated by their size, condition of bole, and obvious presence of redheart disease (n = 7 Virginia pine, 18 pitch pine).

A circular 0.1 ha plot centered around each tree was defined using a 60 m tape. Diameter and species were recorded for all stems equal to or greater than 2.5 cm dbh; these data were segregated by 5 cm diameter classes.

Ten dominant trees within 100 m of cavity trees, and 4 dominant trees within 100 m of potential trees were aged by increment boring. These data were used to determine age of the stands.

Ground cover was classified according to the dominant vegetation present in the plot. This classification was based on visual estimate.

Tree height, live crown height, and cavity height were measured with a Suunto Clinometer. Cavity orientation was determined with the aid of a Silva Ranger Type 15-T compass. Simple t-tests (Snedecor and Cochran, 1967)

were used to compare number of stems, basal areas, tree heights, live crown heights, and DBH between 4 active sites from the Catoosa Wildlife Management Area, 1 active site from GSMNP, 2 inactive sites from the GSMNP, and 25 "potential" red-cockaded woodpecker sites from the GSMNP.

RESULTS

Area Searched

We estimated that approximately 6000 ha of the study area were comprised of forest types with sufficient amounts of pine to qualify as potential red-cockaded woodpecker habitat. Approximately 33% (1980 ha) of this area was searched for cavity trees (Fig. 1), with 178 man-hours of time utilized to conduct the search (Table 1).

Location, Status, and Characteristics of Cavity Trees

Three cavity trees were located on the study area (Table 2, Fig.1), comprising a single colony representing one clan of red-cockaded woodpeckers. All three trees were situated on the extreme southwest end of Skunk Ridge at roughly the 12-0 foot msl contour. Two of these trees were initially reported by Fred Alsop (personal communication, 1979), and one was found in that vicinity during our efforts to relocate the trees reported by Alsop. One of the cavity trees has several active resin wells, indicating that it was currently being used by red-cockaded woodpeckers. One or two birds were observed in the vicinity by Alsop. The appearance of the resin on the other two cavity trees indicated that they were currently inactive. The plate surrounding the cavity, characteristic of many red-cockaded woodpecker cavities, was absent from all three trees. The cavity trees were located on the side of a moderately steep ridge (Table 2), and were separated from each other by less than 100 m. The active cavity was

excavated in a Virginia pine (P. virginianus), as was one of the inactive cavities. The other inactive cavity was in a shortleaf pine (P. echinata).

The active cavity tree was 15.2 m. tall, while the 2 inactive trees were 17.5 and 21.6 m (Table 2). DBH of the active Virginia pine tree was 31.1 cm; the shortleaf pine, largest of the three in all characteristics was 35.0 cm, and the inactive Virginia pine was 27.5 cm DBH. The active cavity was 4.9 m above ground while the inactive cavities were 7.0 m and 7.3 m high in the shortleaf and Virginia pines, respectively.

Stand Characteristics for Plots Surrounding Cavity Trees

Basal Area

Total basal area on plots surrounding the three cavity trees ranged from 19.4 to 32.8 m^2/ha (Table 3). Basal area around the active cavity tree was intermediate at 24.2 m^2/ha. In all three cases, pine contributed the majority of basal area. However, the hardwood component of basal area was higher (6.7 m^2/ha) in the plot surrounding the presently active cavity tree than in the two inactive plots.

Stems Per Hectare

Number of stems per hectare > 2.5 cm for the active cavity tree plot was 1970, intermediate between the stem density for the two inactive tree plots (Table 3). The proportion of total stems comprised of pines was much higher on the two plots surrounding Virginia pine cavity trees than on the shortleaf pine plot.

Age of Forest Stands

The active cavity tree was in a stand estimated to be 141.6 years old. The cavity tree could not be aged due to advanced decay caused by redheart disease. The two inactive cavity trees were in stands of about the same age (137.8 and 136.4 years). The shortleaf pine cavity tree was 136 years old, while the Virginia pine could not be aged due to interior wood decay.

Percent Slope

All cavity trees were situated on steeply sloping hillsides. The active cavity tree was on a 62% slope while the inactive Virginia and shortleaf pine cavity trees were on plots sloping at 40% and 60%, respectively.

Floristic Composition

Overstory. The pine component of the overstory included Virginia, pitch, white, and shortleaf, except shortleaf was missing from the inactive Virginia pine plot. Black gum (Nyssa sylvatica), chestnut oak (Quercus prinus), and sourwood (Oxydendron arboreum) were important hardwoods on the active cavity site. Those species, plus red oak (Q. rubra), black oak (Q. velutina), and red maple (A. rubrum) comprised the hardwood overstory on the inactive sites.

Midstory. The floristic list of midstory vegetation was similar to that for the overstory, except shortleaf pine was not present on any of the plots. Red oak and red maple were present in the midstory of only one inactive cavity site.

Ground cover. Vaccinium sp. occurred as the only significant ground cover on any of the plots.

Comparison with Active Trees on Catoosa Wildlife Management Area

The Catoosa Wildlife Management Area (CWMA) in Cumberland County, TN contains the largest concentration of colonies of red-cockaded woodpeckers in Tennessee. Most of these colonies are inactive, but 4 active cavity trees were selected for comparison with the 3 cavity trees located in GSMNP. All 4 cavity trees on CWMA are Virginia pine.

Active trees on CWMA were slightly but not significantly taller ($\bar{x}$ = 21.1 m) and larger DBH ($\bar{x}$ = 37.8 cm) than cavity trees on GSMNP.

Mean basal area for the 4 active sites on CWMA (27.5 m^2/ha) was within the range of basal area for the 3 sites on GSMNP. It was very similar to the basal area on the GSMNP active site (24.2 m^2/ha). Total number of stems per hectare was also similar for the 2 areas, but the proportion of hardwood stems was much higher on the CWMA (Table 4). The markedly different topographic features of the 2 areas were reflected in the percent slope of the plots containing cavity trees. Percent slope for cavity trees on the relatively flat CWMA ranged from 8-22% in contrast to the range of 40-64% on GSMNP.

Availability of Cavity Trees in GSMNP

Average height (22.8 m) and DBH (39.9 cm) of selected potential cavity trees was slightly but not significantly larger than those characteristics for cavity trees, yet the trees which could be aged were younger (Virginia pine, n = 5 $\bar{x}$ = 90.2 years; pitch pine, n = 9, $\bar{x}$ = 118.2 years). They were also in younger stands; mean stand age was 92.6 years for Virginia pine and 99.5 years for pitch pine sites. Total basal area for all "potential" cavity tree sites was 28.6 m^2/ha, within the range of basal area for the cavity tree sites on GSMNP and very similar to the mean basal area for 4 active cavity tree sites on CWMA (27.5 m^2/ha). Total stems per hectare were also similar for all 3 sets of trees.

DISCUSSION

The red-cockaded woodpecker is extemely rare, perhaps nearing extinction in the Great Smoky Mountains National Park. It has never been common since its discovery there by Fleetwood (1936) in the early 1930's. Its continued presence in GSMNP has been documented sporadically since that time (Stupka 1963, Tanner 1965, Fred Alsop, pers. comm. 1979). Our field

investigation covered roughly 30% of the most favorable habitat in the southwestern portion of the park. One colony area, representing a single clan, was observed. Though other clans may, and probably do, exist in the GSMNP, the extreme rarity of the bird precludes any population estimate for the entire area.

Its extreme rarity poses at least 2 significant problems for the species to maintain itself in this isolated section of its range. First, replacement of a lost mate will be difficult or impossible. Loss of one bird could ultimately mean loss of a clan. Secondly, with little opportunity to interact with other clans, inbreeding and consequent reduction in genetic variability could ultimately result in a lessened ability to adapt to or cope with its obviously marginal habitat.

Our evaluation of this habitat suggests that availability of suitable individual trees for constructing cavities likely is not a factor responsible for the bird's low numbers. Three species of pine suitable for cavity building, Virginia, pitch, and shortleaf, are abundant and widespread. Redheart disease is prevalent among all 3 species. Characteristics of 25 selected trees measured in the GSMNP were similar to characteristics of 3 trees used for cavities.

Other aspects of the habitat, however, may be so marginal as to restrict or prevent any expansion of the population. Hardwoods make up a much larger proportion of the forest canopy and midstory than is characteristic in ideal Coastal Plain habitat. This high proportion of hardwoods is detrimental to both the colony site and to the foraging area. Hooper at al. (1979) suggested that the colony site should include 2-4 ha of mature pine with a basal area of 12-18 m^2/ha. Few or no hardwoods above

4.6 m should be present. This situation rarely, if ever, is encountered in GSMNP. Hardwoods are usually abundant on almost all sites, with few pure stands of pine preferred for colony site available to the woodpeckers.

Hooper et al. (1979) also emphasized that good foraging habitat consists of pine stands with trees 22.9 cm DBH and larger. Clans regularly forage in mixed pine-hardwoods stands, but pure hardwood stands are of little value. Red-cockaded woodpecker clans require at least 40 ha of good foraging habitat or a few hundred hectares of poor foraging habitat for survival; thus, poor foraging habitat may be another habitat deficiency suppressing population expansion.

In summation, though individual pines suitable for cavity trees are abundant in the southwestern portion of the GSMNP, the lack of moderately large pure stands of mature pines needed for colony sites and foraging areas likely is the factor limiting this population.

SUGGESTIONS FOR MANAGEMENT

A management strategy for preserving red-cockaded woodpeckers in GSMNP should involve three facets: (1) delineating status and distribution of colonies, (2) managing existing colony sites, and (3) long term habitat enhancement.

Distribution of Colonies

Efforts to locate additional colonies should be intensified on the remaining 67%+ area of potential habitat not searched during this study. We concentrated on areas where birds had been reported previously. It is probable that these locations are no more likely to contain colonies than other locations in suitable habitat. Thus, systematic searches should be conducted throughout the southwestern portion of GSMNP. These efforts

should be conducted after leaf fall and during periods of good weather.

Managing Existing Colony Sites

The recently discovered colony site on Skunk Ridge should be managed to improve habitat conditions around the active cavity tree. Hooper et al. (1979) recommended that in colony sites lacking previous hardwood control, all hardwoods 4.6 m tall or taller within 15 m of active cavity trees should be removed by cutting. A major factor causing red-cockaded woodpeckers to abandon cavity trees is encroachment of hardwood crowns at the level of the cavity entrance. Since most cavities are at least 4.6 m above ground, it is the mid-story hardwoods which should be removed first. (Height of the active cavity on Skunk Ridge is 4.9 m). Smaller hardwoods should also be removed, as these may soon grow into size classes detrimental to the site. Hooper et al. (1979) recommended controlled burning for this removal, referring principally to Coastal Plain and Piedmont sites. On these much flatter sites, however, controlled burning is a regularly used forest management tool and is much simpler to apply than would be the case on the steep topography of the GSMNP. Chemical or mechanical control may be more appropriate for the active colony site on Skunk Ridge. If chemical or mechanical control of understory proves ineffective or unfeasible, and if sufficient fuel is present on the site, spot burning may be accomplished. In this case wide fire lanes should be raked, not plowed, and the burn should be down slope to reduce danger of escape from the fire lanes. Even under these circumstances, Virginia pine sites may be damaged. A burn of sufficiently low intensity to protect Virginia pine probably would not accomplish hardwood control.

Total basal area surrounding the cavity tree is greater than recom-

mended by Hooper et al. (1979) (11.5 - 18.5 m^2/ha). Removal of all hardwoods in the canopy and mid-story would reduce basal area of the site to about 17.5 m^2/ha, or within the recommended range.

Long-term Habitat Enhancement

In final analysis, the long term preservation of red-cockaded woodpeckers in GSMNP will rely upon the perpetuation of suitable colony sites for foraging habitats. Mature pine stands are the essential component of these two critical habitat elements. Since pine stands largely represent successional communities on disturbed sites, and because harvest of forests (which may regenerate pines) is not permitted in national parks, the perpetuation of pine will likely come about as a result of natural catastrophes, particularly fire. Hence, the policy and programs governing suppression of wildfire will play an important role in the welfare of red-cockaded woodpeckers in GSMNP.

Certain pertinent criteria of woodpecker nesting habitat were delineated by Lennartz and McClure (1979). These are:

> "1. Pine forest types including. . . shortleaf,. . . Virginia, and pitch pines. All hardwood forest types . . . are excluded.
>
> 2. Sawtimber stand size, indicating a forest in which the primary stand is in trees 22.9 cm d.b.h. or larger.
>
> 3. Stand age of 50 years of older."

Since these criteria were developed primarily for Coastal Plain and Piedmont sites, with higher site indexes for pines than is typical in the GSMNP, it is probable that stands will require longer to develop than the minimum 50 years stipulated in the third point. A suitable stand, however, may remain acceptable for several decades providing the hardwood component is properly suppressed.

The following guidelines should be considered when establishing policy for managing or suppressing wild fires in the Park:

1. Any wild fire which threatens an existing colony site should be suppressed immediately. Virginia pine is particularly susceptible. As noted by Carvell (1978), "Fire protection is an essential part of Virginia pine management, since Virginia pines of all ages are susceptible to fire due to their characteristically thin bark. Although there are reports of sawtimber-size Virginia pines withstanding light ground fires, even old-growth trees die readily if heavy accumulations of fuel result in scorching burns." Harmon (memorandum, 28 January 1980) suggested that frequent ground fires set by early settlers in what now is the western end of the park eliminated much of the young reproduction of Virginia pine, and the species was much less abundant then than now. Shortleaf pine is more resistant to fire, but it, too, can be severely damaged by intense fires.
2. Mature stands of southern yellow pines with low percentages of hardwood stocking should be protected from fire. These may eventually be discovered and utilized by the woodpeckers for colony sites and foraging areas.
3. Specific sites in the southwestern portion of the Park presently occupied by hardwoods may have a high probability of producing pine stands in the aftermath of fire. According to Harmon (memorandum 28 January 1980), Virginia pine in GSMNP dominates on former old field sites and also on southeast to southwest facing middle to upper slopes below 2200 feet msl. Francis (1978) noted that shallow

or rocky ridges and exposed south slopes are excellent areas to encourage Virginia pine. Formerly burned or logged areas with low fertility and eroded old fields support many of the present stands of Virginia. Francis commented that, "The best attribute of Virginia pine is its ability to produce impressive yields on sites where most other species have difficulty just surviving. I have seen Virginia pine with 16 - foot sawlogs growing on soil less than 8 inches deep." Shortleaf pine also occurs with Virginia pine on old field sites. Of the two species, Virginia pine seems more likely to form nearly pure stands with a low hardwood component. It is a prolific seeder, and is most successful on poor sites where hardwoods are at a severe competitive disadvantage. Since it is readily used for cavity trees by red-cockaded woodpeckers in Tennessee, it may be advantageous to emphasize this species for developing future red-cockaded woodpecker habitat. This may be accomplished by permitting wild fires to burn through areas where Virginia pine is likely to become established after burning, areas such as those described by Francis (1978) and by Harmon. In some experiments, burning has enhanced the regeneration of Virginia pine (Kundt 1978), and in the absence of logging, burning may be the only method for insuring perpetuation of Virginia pine stands in the GSMNP ecosystem. Shortleaf pine regeneration also may be enhanced by burning. Lawson (1978) noted that burning prepared a more uniform seed bed than logging along would do; on areas where sufficient seeds were available, burning resulted in excellent seedling establishment.

Once a dense stand of pine seedlings is established following a wild fire, the area should be well-protected from future fires. When the trees reach a size which can be subjected to controlled burning without serious danger of destruction, then cool prescription burns may be implemented, particularly on shortleaf sites, to reduce hardwood encroachment.

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Figure 1. The Study Area [1]

1. 16, 17 April 1935; along Highway 129 near Revenue Hill; 2 Birds; (Fleetwood 1936).

2. 19 April, 1937; Cave Gap (1700'); 1 bird; (Fleetwood 1936) 21 December 1966; 3/4 Mile East of Cave Gap; 4 Birds; (Tanner 1966)

3. 29 April 1935; Andy McCeilly Ridge near Rabbit Creek (2210'); 1 bird; (Fleetwood 1936).

4. 17 March 1953; Tabcat Creek near Park boundry; 3 birds; (Stupka 1963).

5. 22 March 1965; Wedge Ridge; 1 bird, 3 typical cavities 8 May 1965; a pair observed at one of these cavities was observed displaying incubating behavior
16 May 1976; adults observed feeding young; (Tanner Pers. Comm.)

6. 12 February 1966; Western end of Skunk Ridge; 3 birds
14 December 1967; 3 birds; (Tanner Pers. Comm.)

7. 5 March 1966; Shop Ridge; 3 birds; (Tanner Pers. Comm.)

8. 21 March 1968; Tarkiln Ridge; 1 bird; (Tanner Pers. Comm.)

9. 28 March 1973; Beard Cave Mountain; 1/4 mile west of Copper Road; (Nape Shelton)

10. 28 June 1979; 1 inactive cavity tree
May 1979; western end of Skunk Ridge; 1 active, 1 inactive cavity tree, (Fred Alsop Pers. Comm.)

[1] Numerals refer to respective observations

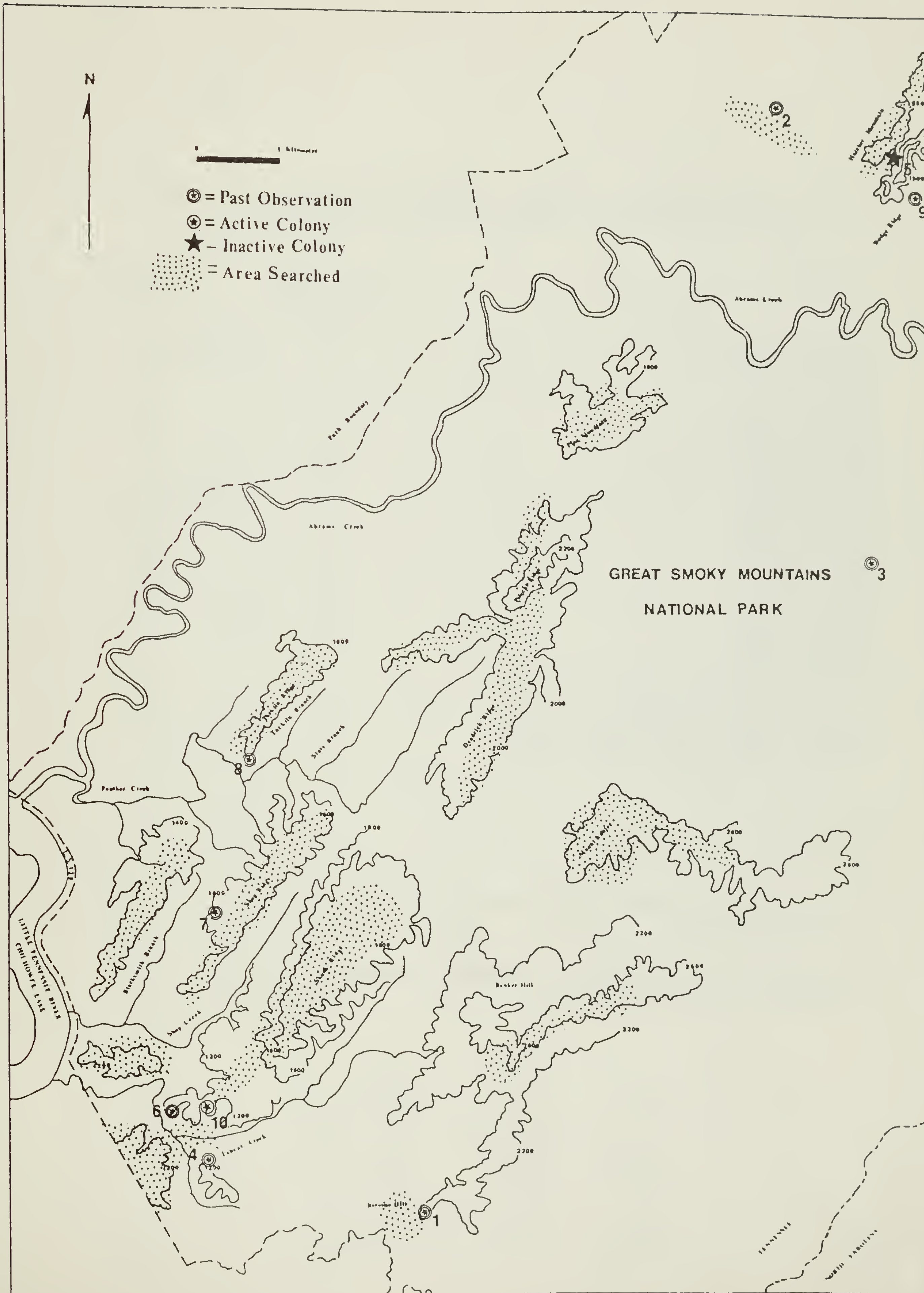
N
= Past Observation
= Active Colony
– Inactive Colony
= Area Searched
GREAT SMOKY MOUNTAINS
NATIONAL PARK
Abrams Creek
1
2
3
4
5
6
7
8
9
10

Table 1. Areas searched and effort expended attempting to locate red-cockaded woodpeckers in GSMNP, 28 May - 29 June, 1979.

Area	Access Time[1] (hours)	Man-Hours[2]
Arbutus Ridge	4	20
Bunker Hill	2	12
Crooked Arm	2	6
Deadrick Ridge		
Hannah Mountain	4	12
Mount Lanier	5	4
Panther Creek	3	4
Pine Mountain	4	12
Polecat Ridge		
Revenue Hill	2	15
Shop Ridge	2.5	12
Skunk Ridge	4	20
Tabcat Creek	1.5	8
Tarkiln Ridge	5	9
Wedge Ridge	4	8
Unnamed Ridge N. of Cades Cove Loop Road Near Cooper Road	2	15
Unnamed Ridge Northeast of Shop Ridge	2	12
Unnamed Ridge South of Shop Creek 1 Mile East of U.S. 129	2	9
Total		178

[1]Time required to reach study area and return from the nearest road open to motor vehicles.

[2]Man-hours spent searching for birds and bird sign in designated areas (does not include access time).

Table 2. Status and characteristics of trees utilized for nest cavities by red-cockaded woodpeckers, GSMNP, 1979.

Status of Cavity Tree	Tree Species	Tree Height (m)	Live Crown Height (m)	D.B.H. (cm)	Nest Cavity Orientation	Nest Cavity Height (m)	% Slope of Ridgeside	No. of Start Cavities[2]
Probably inactive (may have been recently active) Resin mostly white, some fresh resin but not a significant amount	Shortleaf pine	21.6	9.1	35.0	S, 50°, W	7.0	64	1
Currently active Several active resin wells exuding copious amounts of fresh resin	Virginia pine	15.2	7.6	31.1	N, 40°, W	4.9	62	0
Probably inactive for several years Resin mostly grey and black	Virginia pine	17.3	11.2	27.5	N, 50°, W	7.3	40	0

[1]A normal cavity is a cavity that is at a stage of completion making it habitable.

[2]A start cavity is defined as a cavity that is currently being excavated and is not habitable.

Table 3. Stand characteristics for plots surrounding cavity trees in GSMNP, 1979.

Cavity Status	Basal Area (m^2/ha)			Stems/ha			Mean Age of Stand	Percentage Slope
	Hdwoods.	Pines	Total	Hdwoods.	Pines	Total		
Active								
Virginia pine	6.7	17.5	24.2	420	1550	1970	141.6	62
Inactive								
Virginia pine	1.7	31.1	32.8	390	1690	2080	137.8	40
Shortleaf pine	4.4	15.0	19.4	730	780	1510	136.4	60

Table 4. Tree and stand characteristics for four active Virginia pine cavity trees on Catoosa Wildlife Management Area, Cumberland County, TN, 1979.

Characteristic	Mean value (n=4)	Range
Tree height	21.1 m	16.9 - 26.1 m
Tree DBH	37.8 cm	35.0 - 40.5 cm
Site basal area		
Hardwoods	10.3 m^2/ha	6.5 - 14.4 m^2/ha
Pines	17.2 m^2/ha	13.0 - 20.2 m^2/ha
Total	27.5 m^2/ha	22.5 - 30.4 m^2/ha
Site stems/ha		
Hardwoods	1315	840 - 1960
Pines	480	460 - 500
Total	1795	1300 - 2460

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environment and cultural value of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.