2022

Investigation of red-cockaded woodpeckers in Virginia: Year 2021 report

Bryan Watts
William & Mary

Chance Hines
William & Mary

Laura Duval
William & Mary

Barton Paxton
William & Mary

Recommended Citation

Watts, B. D., C. Hines, L. Duval, and B. J. Paxton. 2022. Investigation of red-cockaded woodpeckers in Virginia: Year 2021 report. Center for Conservation Biology Technical Report Series: CCBTR-22-01. William & Mary, Williamsburg, VA. 36 pp.

INVESTIGATION OF RED-COCKADED WOODPECKERS IN VIRGINIA: 2021 REPORT

THE CENTER FOR CONSERVATION BIOLOGY

WILLIAM & MARY

Investigation of Red-cockaded Woodpeckers in Virginia: 2021 report

Bryan D. Watts
Chance Hines
Laura Duval
Barton J. Paxton
The Center for Conservation Biology
William & Mary
Williamsburg, VA 23187-8795

Recommended Citation:

Watts, B. D., C. Hines, L. Duval, and B. J. Paxton. 2022. Investigation of red-cockaded woodpeckers in Virginia: Year 2021 report. Center for Conservation Biology Technical Report Series, CCBTR-22-01. William & Mary, Williamsburg, VA. 36 pp.

Project Funded By:

The Nature Conservancy (Virginia Chapter)

The Center for Conservation Biology
William & Mary

Virginia Department of Wildlife Resources through a Federal Aid in Wildlife Restoration Grant from the U.S. Fish and Wildlife Service

Front Cover Image: Chance Hines approaches nest tree at Cluster 6. Photo by Laura Duval.

The Center for Conservation Biology is an organization dedicated to discovering innovative solutions to environmental problems that are both scientifically sound and practical within today's social context. Our philosophy has been to use a general systems approach to locate critical information needs and to plot a deliberate course of action to reach what we believe are essential information endpoints.

Table of Contents

Contents

EXECUTIVE SUMMARY

The Virginia population of red-cockaded woodpeckers is the northernmost throughout the species range and has been in eminent danger of extinction for more than 30 years. The Piney Grove Preserve represents a nucleus for recovery in the state and the focus of a multi-organizational partnership designed to increase the population to a sustainable level. The partnership has executed a program of aggressive habitat management, cavity-tree management and woodpecker population monitoring and management that has resulted in a quadrupling of the breeding population since the early 2000s.

During the 2021 breeding season, Piney Grove Preserve supported 16 potential breeding groups (including one in the Big Woods) that produced 32 fledglings. All groups made breeding attempts, including the cluster in Big Woods for the third time, though two clusters (cluster 5 and Big Woods) failed to produce fledglings. The population as a whole had a reproductive rate of 2.1 ±0.28 (mean±SE) young/breeding group. The 16 groups that made breeding attempts had a success rate of 87.5% (14 of 16). Fledging rate for the 14 productive pairs was 2.4±0.22. Of the 60 eggs followed in 2021, 44 (73.3%) hatched, 35 (58.3%) survived to banding age, and 32 (55.0%) fledged. Birds that fledged included 18 females and 14 males. Nineteen of these birds were retained and detected during the winter count.

During the calendar year of 2021, 107 individual red-cockaded woodpeckers were identified within Piney Grove Preserve including 75 birds that were hatched at Piney Grove during previous years and 32 nestlings that fledged during the 2021 breeding season. Forty-two birds (39%) were in their fourth year or more and thirteen birds (12%) were at least in their tenth year. One bird was 15 years old (16th calendar year).

Moving into the breeding season there were 66 birds identified within Piney Grove Preserve distributed among 16 clusters. This is the second-most birds Piney Grove has carried heading into the breeding season (one fewer than in 2020). The number of birds per cluster varied from two to eight with a mean of 4.13±0.47 (mean+SE). Eighty-one birds were detected during the 2021 winter survey. This represents a 1% increase over the winter of 2020 and a 5% increase over the winter of 2019. Birds present during the winter survey included 19 of the 32 birds fledged in 2021 and 62 adult birds hatched in previous years. Group size in winter ranged from three to nine birds and averaged 5.06 ± 0.41 (mean±SE) birds per group.

BACKGROUND

Context

The red-cockaded woodpecker (*Dryobates borealis*) is endemic to the southeastern pine ecosystem breeding from Texas and Oklahoma east to Florida and north to Virginia (Jackson 1994). Highly specialized, the species requires old-growth, fire-maintained pine savannas. Throughout the twentieth century advances in transportation, wood processing, and silvicultural practices shifted the emphasis from long-rotation lumber production to maximum-yield fiber production and resulted in catastrophic declines in habitat availability for this species. Breeding distribution contracted from the edges of the range and became localized within the core of the historic range where remnant old growth remained. The red-cockaded woodpecker was listed as endangered in 1970 and received protection with the passage of The Endangered Species Act in 1973 (16 U.S.C. 1531 et seq).

The historic status and distribution of the red-cockaded woodpecker in Virginia is poorly known because no systematic survey of the species was completed prior to dramatic habitat losses. Early accounts of red-cockaded woodpeckers were made from all physiographic provinces of Virginia. Jurisdictions with records include the counties of Giles (Bailey 1913), Albemarle (Rives 1890), Brunswick (Murray 1952), Dinwiddie (Murray 1952), Chesterfield (Murray 1952), Southampton (Steirly 1949), Sussex (Steirly 1950), Prince George (Steirly 1957), Greensville (Steirly 1957), Isle of Wight (Steirly 1957) and the current independent cities of Norfolk (Bailey 1913), Suffolk (Steirly 1957), Virginia Beach (Sykes 1960), and Chesapeake (van Eerden and Bradshaw, unpublished observation). The first systematic survey of the species was initiated in 1977 and resulted in the documentation of 43 clusters within 5 counties (Miller 1978). By 1980, only 9 of these clusters were still forested (Bradshaw 1990). During the 20-year period between 1980 and 2000, the decline of the Virginia population is well documented (Watts and Bradshaw 2005). By 1990, only 5 of the original 23 clusters detected in 1977 were still active. During the breeding season of 2002, Virginia supported only 2 breeding pairs and 2 clusters with solitary males.

The red-cockaded woodpecker was recommended for endangered status within the state of Virginia in 1978 (Byrd 1979) and 1989 (Beck 1991) and was listed as a Tier I Species of Greatest Conservation Need in the 2005 Virginia Wildlife Action Plan (VDGIF 2005). The stated rationale for recommendations was the extremely low and declining population in Virginia, continued loss and degradation of required old-growth forests and the fact that all remaining breeding sites existed on private lands making appropriate management unfeasible. Following these recommendations, the Virginia Department of Wildlife Resources and partners have mounted extensive monitoring and management efforts for the past 30 years. Acquisition of the Piney Grove Preserve in 1998 by The Nature Conservancy was a critical turning point in the species' recovery (Watts and Bradshaw 2005). Intensive habitat and population management on this last remaining site in Virginia has resulted in a population increase from 2 breeding groups in 2002 to 13 breeding groups by 2014 (Wilson et al. 2015). A three-phase conservation plan is in place for the Virginia population that includes the establishment of additional breeding locations (Watts and Harding 2007). Translocation of birds into the Great Dismal Swamp National Wildlife Refuge has been executed during the falls of 2015-2021 with the intent of establishing a second breeding population within the state (Watts et al. 2018). The first successful breeding in the refuge was documented during the spring of 2017 (Watts et al. 2018).

OBJECTIVES

The primary objective of this ongoing project is to monitor the population of red-cockaded woodpeckers within the Piney Grove Preserve. A secondary objective is to collect information relevant to the continued management of birds and their habitat in Virginia. Specific objectives include:

1) To determine the number and identification of all birds resident within Piney Grove during the 2021 calendar year.

2) To monitor breeding activity in order to document productivity and allow for the unique banding of all individuals within the population.

3) To monitor and manage nest trees and cavity condition.

METHODS

Site Description

Piney Grove Preserve contains an old-growth loblolly, pond pine, and short-leaf pine community in Sussex County, Virginia. The site supports a complex of moderate-age pine stands interspersed with pockets of older trees ranging from 80 to 140 years. Historically, the site was managed for saw timber on a relatively long rotation by Gray Lumber Company. The site was purchased by Hancock Timber Resource Group in 1993. Under Hancock Timber's management, site quality was improved by removing the dense hardwood understory. The Nature Conservancy purchased the tract from Hancock Timber in 1998. The Nature Conservancy has developed an aggressive management program designed to restore the disturbance regime necessary to return the site to an open pine savannah.

A single cluster of red-cockaded woodpeckers was discovered within this site in 1985. A second clan was discovered in 1994 and a third in 1995. These three clusters still remain active. Since 1999, there have been 12 recruitment clusters established by The Nature Conservancy through the installation of artificial cavities.

Banding

Being able to identify individual birds is an essential element of the monitoring program. Banding individuals with unique combinations of color bands allows for their identification and, for this reason, has been one of the project goals.

Adults

Adult birds are captured using a specialized net mounted on a telescopic pole shortly after they roost at dusk or during emergence in the morning. Shortly after the birds are "roosted", the net is raised in place and the bird is enticed out into the net. Net poles are only effective on cavities below 50 feet in height. In 1998, Don Schwab banded 10 red-cockaded woodpeckers within the Piney Grove complex. In 2000, seven

of these birds were still resident within Piney Grove. During 2000, Bryan Watts banded an additional four adult birds, leaving only two unbanded birds in the population (one each in clusters 3 and 5). The two remaining unbanded adults within clusters 3 and 5 were lost during 2004 and 2005 respectively. Since this time, nearly all birds within the population have been individually identified by unique, color-band combinations. The only birds that remain unbanded are nestlings that could not be removed from nest cavities and have not been captured after fledging.

Nestlings

For logistical and safety reasons, banding of red-cockaded woodpecker nestlings is restricted to an age window of 5-10 days. Because of this restriction, close monitoring of breeding activity is essential to successful banding. During the early portion of the breeding season, we monitored both the breeding pair and the nest cavity from each cluster area to determine clutch initiation dates. We used a miniature video camera mounted on a telescopic, extendable pole to monitor breeding status. The pole can accommodate cavity heights to 50 feet (15.2 m). For cavities exceeding that height, we determined breeding status by monitoring adult activity around the cavity entrance or by climbing nest trees. We estimated hatching dates from egg dates and closely monitored nest cavities around the time of expected hatching to verify hatch dates. We projected the banding window for nestlings from estimated hatching dates.

We banded all nestlings within the recommended age window. We climbed nest trees with Swedish climbing ladders and extracted nestlings from cavities using a noose apparatus. We lowered nestlings to the ground, banded, weighed and measured them and returned them to cavities. Each nestling received a unique combination of color bands as described above. Nestlings were weighed at the time of banding using a Pesola spring scale. We determined the sex of nestlings either by examining crown plumage while in the cavity or during fledge checks. We confirmed fledging of all birds in the first two weeks after the projected fledge date.

General Observations

As in previous years, we conducted two systematic surveys of all birds within Piney Grove Preserve to identify individuals and to determine distribution. We conducted surveys in the early spring prior to the expected breeding window and in early winter after the expected dispersal period. We visited all clusters before dawn to count the number of individuals emerging from roost cavities and/or joining emerging birds to determine cluster size. We followed birds while they were foraging to read combinations of color bands with spotting scopes. We systematically worked through all sites over a period of days until all individuals were identified. Once clutches were laid, observations were made at the nest cavity to identify the breeding male and female for each site.

RESULTS

Breeding Observations

Piney Grove supported 16 potential breeding groups (including one in Big Woods) in 2021 that produced 32 fledglings (Table 1). All potential breeding groups made breeding attempts. Cluster 5 and the Big Woods cluster both failed after producing nestlings (see details below). The population as a whole had a

reproductive rate of 2.1 ±0.28 (mean ± SE) young/breeding group with a success rate of 87.5% (14 of 16). Fledging rate for the 14 productive pairs was 2.36±0.22. Of the 60 eggs monitored in 2021, 44 (73.3%) hatched, 35 (58.3%) survived to banding age, and 32 (55.0%) fledged (Table 1). Birds that fledged included 18 females and 14 males (Table 2). Nineteen of these birds were retained and detected during the winter count.

Table 1. Summary of 2021 breeding activity for red-cockaded woodpeckers within Piney Grove Preserve.

Breeding Group	Potential Breeding Group?	Breeding Attempt?	Eggs Laid	Eggs Hatched	Banding Age	Fledged
Cluster 1	Yes	Yes	5	4	4	4
Cluster 3	Yes	Yes	3	2	2	2
Cluster 5	Yes	Yes	6	5	0	0
Cluster 6	Yes	Yes	3	2	2	2
Cluster 7	Yes	Yes	3	3	3	3
Cluster 8	Yes	Yes	3	2	2	2
Cluster 10	Yes	Yes	4	3	3	3
Cluster 11	Yes	Yes	3	2	2	2
Cluster 12	Yes	Yes	3	3	3	3
Cluster 13	Yes	Yes	3	2	2	2
Cluster 15	Yes	Yes	4	1	1	1
Cluster 17	Yes	Yes	4	3	1	1
Cluster 18	Yes	Yes	3	2	2	2
Cluster 19	Yes	Yes	6	5	4	3
Cluster 20	Yes	Yes	3	3	2	2
Big Woods	Yes	Yes	4	2	2	0
Total	**16**	**16**	**60**	**44**	**35**	**32**

Table 2. List of red-cockaded woodpecker nestlings banded within Piney Grove Preserve during the 2021 breeding season. Genders were determined during fledge checks.

Breeding Group	Date	USGS Band	Left	Right	Sex
Cluster 1	5/21/2021	2421-01635	DG/YE/DG	AL/HP	M
Cluster 1	5/21/2021	2421-01636	AL/RE	DG/YE/DG	M
Cluster 1	5/21/2021	2421-01637	AL/DG	YE/DG/YE	F
Cluster 1	5/21/2021	2421-01638	AL/LB	DG/YE/DG	F
Cluster 3	5/21/2021	2421-01640	DB/RE/DB	AL/DG	F
Cluster 3	5/21/2021	2421-01641	RE/DB/RE	AL/LB	F
Cluster 6	5/28/2021	2421-01655	WH/DB/WH	AL/DG	F
Cluster 6	5/28/2021	2421-01656	AL/DB	WH/DB/WH	M
Cluster 7	6/14/2021	2421-01657	RE/BK/RE	AL/RE	M
Cluster 7	6/14/2021	2421-01658	BK/RE/BK	AL/YE	F
Cluster 7	6/14/2021	2421-01659	AL/RE	RE/BK/RE	M
Cluster 8	5/24/2021	2421-01645	DB/YE/DB	AL/DB	M
Cluster 8	5/24/2021	2421-01646	AL/DG	DB/YE/DB	M
Cluster 10	5/24/2021	2421-01649	AL/DG	WH/OR/WH	F
Cluster 10	5/24/2021	2421-01650	WH/OR/WH	AL/OR	F
Cluster 10	5/24/2021	2421-01651	AL/RE	OR/OR/OR	F
Cluster 11	5/17/2021	2421-01631	AL/LB	YE/LB/YE	M
Cluster 11	5/17/2021	2421-01632	AL/OR	LB/YE/LB	M
Cluster 12	5/24/2021	2421-01642	RE/YE/RE	AL/DB	F
Cluster 12	5/24/2021	2421-01643	AL/OR	YE/RE/YE	M
Cluster 12	5/24/2021	2421-01644	YE/RE/YE	AL/DG	M

Breeding Group	Date	USGS Band	Left	Right	Sex
Cluster 13	5/28/2021	2421-01653	AL/LB	OR/YE/OR	F
Cluster 13	5/28/2021	2421-01654	OR/YE/OR	AL/YE	M
Cluster 15	5/28/2021	2421-01652	AL/DG	DB/OR/DB	M
Cluster 17	5/14/2021	2421-01630	DG/BK/DG	AL/DB	F
Cluster 18	5/14/2021	2421-01624	RE/DG/RE	AL/LB	F
Cluster 18	5/14/2021	2421-01625	AL/OR	RE/DG/RE	M
Cluster 19	5/14/2021	2421-01626	AL/DG	Ye/WH/YE	U
Cluster 19	5/14/2021	2421-01627	WH/YE/WH	AL/LB	F
Cluster 19	5/14/2021	2421-01628	AL/OR	WH/YE/WH	F
Cluster 19	5/14/2021	2421-01629	YE/WH/YE	AL/HP	F
Cluster 20	5/24/2021	2421-01647	AL/OR	DB/LB/DB	F
Cluster 20	5/24/2021	2421-01648	AL/YE	LB/DB/LB	F
BW1	5/14/2021	2421-01622	PW/DB/PW	AL/DB	U
BW1	5/14/2021	2421-01623	PW/DB/PW	AL/RE	U

Breeding Details

Cluster 1 – The breeding male (DG/YE/DG, WH/AL) was present for the ninth consecutive breeding season, though no breeding was recorded in 2014 when all birds present were males. The laying female (AL/OR, LG/DB/LG) from the previous five years was not observed during the breeding season. Two females (DG/YE/DG,AL/YE and LB/WH/OR,AL/DG) were observed in the cluster and both are presumed to have laid eggs due to the sequence of egg laying and hatching. The birds used the same tree that was used during 2020 breeding season. One egg was detected on 23 April, a second egg was detected on 28 April, and then five eggs were detected on 6 May. Nestlings were first detected on 11 May and four were banded on 21 May. The nestlings on varied in age from 7.5 to 10 days of age (physical age). Fledge checks on 4 June and 9 June identified the four young as two females and two males. During the 2021 winter head count, two of these birds were identified in cluster 1 including one male (AL/RE,DG/YE/DG).

Cluster 3 – The breeding male (AL/WH, DB/RE/DB) remained for the sixth consecutive year and the breeding female (YE/(OR)/(YE), AL/YE) nested for the fifth consecutive year. The pair nested in Tree 313 for the third consecutive year. This tree is too tall to pole, but we observed the female exiting the cavity on 30 April and we presumed incubation was occurring. We climbed the nest tree on 6 May and five eggs were present. We climbed the tree again on 11 May and four 1 day old nestlings had hatched. We climbed the tree a third time on 17 May and banded two nestlings at 6.5 and 7 days of age (physical age). A fledge check on 9 June identified the two young as females. Both of these birds were identified at cluster 3 during the winter survey.

Cluster 5 – Both breeding adults from the 2019 and 2020 nesting season were still present in 2021. This is the fifth consecutive year at the cluster for the male (LB/WH/LB, AL/DG) and the fourth consecutive year for the female (WH/OR/OR, AL/LB). However, a second female (DB/RE/DB,AL/YE) likely also laid eggs at this cluster due to the egg-laying sequence. This pair nested in Tree 323 for the second consecutive year and was the latest to initiate egg-laying. No eggs were present on 17 May, but a check four days later revealed six eggs in the cavity and a seventh approximately 20 m away from the cavity at the base of a nearby tree. It seems that both females laid full clutches during the four-day period and at least one egg was tossed. Five nestlings were observed on 1 June, but unfortunately, the nest was depredated prior to a nest check on 9 June. There appeared to be mammal scat inside the cavity and we believe flying squirrels are responsible for the nest failure. This cluster was visited throughout the remainder of the field season but no renesting attempts were observed.

Cluster 6 – The pair that bred in this cluster for the past three years (DB/RE/DB, AL/WH and AL/RE, LG/YE/DG) were replaced by a male (WH/DB/YE,PK/AL) that fledged from cluster six in 2017 and a female (RE/YE/RE,AL/DB) that fledged from cluster 12 in 2020. The pair nested in Tree 33, an older cavity that had not been used for nesting in the past. The entrance to this cavity is long and difficult to view all of the contents with the peeper. The tree was climbed on 11 May and three eggs were observed. Two nestlings were observed on 24 May and banded on 28 May at 6 and 6.5 days old (physical age). Both young were identified at cluster 6 during the winter survey.

Clusters 7 & 9 – The breeding male (OR/OR/OR, AL/DG) continued for the tenth consecutive year and the breeding female (OR/AL, WH/RE/WH) for the third consecutive season. This pair in this cluster typically lays eggs relatively early in the breeding season, but was the last to produce eggs this year. The pair nested in tree 298 for the first time and three eggs were observed on 24 May with all three eggs hatched by 4 June. The three young were banded on 14 June at 10-10.5 days (physical age). During a fledge check on 28 June, all birds were identified and two were sexed as male while the third was female.

The delayed nesting may have been due to intragroup conflict which may lead to a split in the near future. A portion of the birds at this cluster foraged independent of the breeders and their helpers. The two birds that seem to be leading the split are a male (DB/(DB)/YE,AL/LG) hatched at cluster 7 in 2016 and a female (DB/WH/YE,AL/DB) hatched at cluster 5 in 2016. Both of these birds were particularly defensive when I approached tree 297 which was the nesting tree during the 2019 and 2020 breeding seasons. This tree was monitored throughout the season and no eggs were ever observed. Two of the young produced at cluster 7, including both of the males (RE/BK/RE,AL/RE and RE/BK/RE,AL/RE) were observed foraging with this

pair away from the breeders during the winter survey. The female young was not observed during the winter survey.

Cluster 8 – Following a 2020 breeding season full of antagonistic interactions and a failed breeding attempt, the breeding pair from the past three years returned in 2021 to nest in the tree used in 2019. This tree was the western-most cavity tree in the cluster prior to a discovery of a cavity near Beaver Dam Road in late 2020. This pair and associated helpers foraged between Beaver Dam Road and the nest tree, which is now named cluster 20 (see below for cluster 20 narrative).

A second pair formed within the heart of cluster 8 and will retain the cluster number. This pair nested in Tree 321 in a cavity 48' high. The pair included a male (BK/(OR)/DB,HP/AL) that fledged from cluster 3 in 2017 and a female (OR/DB/LB,HP/AL) that fledged from cluster 1 in 2017. Two eggs were discovered on 8 May and two 1-day old nestlings were observed on 17 May. Both nestlings were banded on 24 May at 5 and 5.5 days old (physical age). The two birds fledged on 14 June and both were sexed as male. During the winter survey, one of these young (AL/DG,DB/YE/DB) was observed at cluster 8 and the other (DB/YE/DB,AL/DB) was observed at cluster 19.

Cluster 10 – The breeding male (OR/WH/OR, AL/DB) was present for the fifth consecutive year and the breeding female (LB/DB/OR, AL/DG) was present for the third consecutive year. The nest cavity was in tree #214, which was also used in 2017 and 2020. One egg was observed on 30 April and a full clutch of four eggs was observed on 6 May. Three two-day old nestlings were observed on 17 May and banded on 24 May at 9 and 10 days of age (physical age). All three nestlings fledged and were sexed as female on 15 June. One of the young (AL/RE,OR/OR/OR) was observed at cluster 10 during the winter survey, but the other two were unaccounted for.

Cluster 11 – The breeding pair, including male (YE/DB/YE, LB/AL) and female ((OR)/(DB)/(OR), AL/(DB)), were the same for the seventh consecutive year. This pair used a newly excavated tree for nesting, #342, that was too high to pole. We observed a female exit the cavity on 28 April and assumed she was laying or incubating. The tree was climbed on 11 May and two day 3 nestlings and one egg were observed. The two nestlings were banded on 17 May at 9 days old (physical age). During a fledge check on 1 June both of the young were determined to be male. Neither of the young produced were observed during the winter survey.

Cluster 12 – The male (LG/LG/LG, AL/YE) and female (WH/LB/WH, AL/YE) pair from the past four years was replaced by a male (Al/LB,RE/YE/RE) that fledged from cluster 12 in 2020 and a female (GY/DB/LB,HP/AL) that fledged from cluster 7 in 2017. This pair nested in cavity tree #266, which was used by the previous pair the past three years. We recorded three eggs on 6 May and observed three hatch-day nestlings on 17 May. The three nestlings were banded on 24 May at ages 5.5-6.5 (physical age). On 9 June we sexed two birds as male and the third as female. During the winter survey, we only observed one of the young produced (AL/OR,YE/RE/YE) and it remained at cluster 12.

Cluster 13 – The breeding male (WH/RE/WH, AL/DB) was present for the eleventh consecutive breeding season and the female (AL/LG, WH/(PU)/WH) was present for her sixth consecutive breeding season. They used tree #312 for the third year in a row and three eggs were observed on 11 May. Two nestlings were

observed on 24 May and all four nestlings were banded on 28 May at 5 and 5.5 days old (physical age). Both of these birds fledged on 15 June and were identified as one male and one female. The male (OR/YE/OR,AL/YE) produced here was observed at cluster 13 during the winter survey, but the female was not observed.

Cluster 15 – The male (AL/(RE), (YE)/(DB)/(YE)) and female (LB/WH/WH, (PU)/AL) nested in tree #308 for the third consecutive year. This is the fifth breeding season for the male and the tenth for the female. Four eggs were observed on 11 May and one three-day old nestling was observed on 24 May. This nestling was banded at 5.5 days (physical age) on 28 May. During a fledge check on 14 June this bird (AL/DG,DB/OR/DB) was identified as a male and was also located within the cluster during the 2021 winter survey.

Cluster 17 –The breeding male (AL/YE,WH/RE/WH) from 2020 was replaced by a male (WH/RE/WH,YE/AL) that fledged from cluster 7 in 2019, while the female (AL/(LG),YE/YE/(DB) returned for the third consecutive year. They nested in the same cavity as in 2020 (Tree 336) and two eggs were observed on 23 April. A full clutch of four eggs was observed on 28 April and three nestlings were observed on 6 May. Only 1 nestling survived to be banded on 14 May at an age of 6.5 (physical age). The young bird fledged by 1 June and was sexed as female. This bird (DG/BK/DG,AL/DB) was observed at cluster 17 during the winter survey.

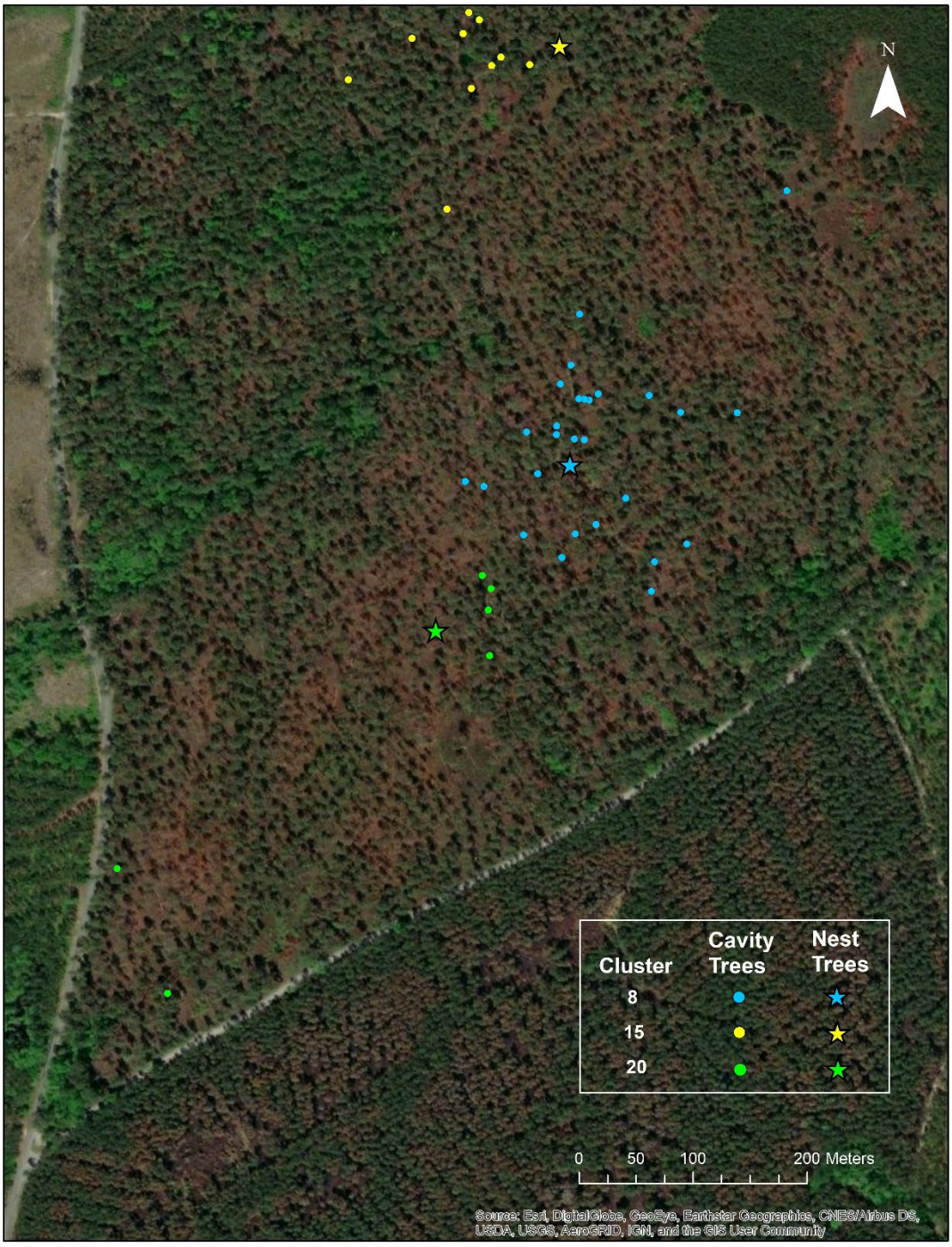
Cluster 18 – The male (YE/(LG)/(LG), AL/WH) and female (LG/YE/LB, AL/YE) from the past two years nested for the second consecutive year in tree 331. Three eggs were discovered on 23 April and two of these eggs hatched on 6 May. Both nestlings were banded on 14 May at 9 days old (physical age). The young birds fledged by 28 May and were sexed as one male and one female. The male (AL/OR,RE/DG/RE) was observed at the cluster during the winter survey but the female was unaccounted for.

Cluster 19 – The breeding male (OR/(DB)/OR, AL/LG) was present for the sixth consecutive season but the breeding female (DB/DB/WH, AL/LB) from the past two seasons was replaced by (AL/DB,OR/OR/OR) who is assumed to have been fledged from an undetected late breeding attempt in cluster 10 during the 2018 breeding season. The pair nested in the same cavity as in the last three years, tree #232. An adult was first observed laying or incubating on 23 April but would not exit the cavity. Six eggs were observed 28 April and five of these hatched on 6 May. We banded four nestlings aged 5-6.5 days old (physical age) on 14 May. We observed three female fledglings on 1 June. The fourth bird was not observed on two additional checks and is presumed to have perished in the nest or shortly after fledging. Two of the young (WH/YE/WH, AL/LB and AL/OR,WH/YE/WH) were observed at cluster 19 during the winter survey but the third fledgling was unaccounted for.

Cluster 20 – The breeding female (LB/WH/LB, (OR)/AL) for the past twelve years at cluster 8 and the breeding male (LG/YE/WH, AL/LB) from the past two years at cluster 8 returned to the nest tree from 2019. This tree was the most western cavity tree in the cluster prior to a discovery of a cavity near Beaver Dam Road in late 2020. This pair and associated helpers foraged between Beaver Dam Road, the nest tree and the office. We are now considering this group to be associated with cluster 20 (Figure 1) and a newly formed pair to be Cluster 8 (see Cluster 8 narrative above).

We first observed three eggs on 06 May and followed up by observing three nestlings on 17 May that were approximately two days old. Two of these nestlings survived to be banded on 24 May as ten day old (physical age) nestlings. Both birds were observed as female fledglings on 9 June. Only one of the young (AL/OR,DB/LB/DB) produced at this cluster was observed during the winter census and it remained at cluster 20.

Figure 1. Map showing the division of clusters 8 and 20.



Big Woods – A pair of birds bred for the third year in a row at the Big Woods cluster during 2021. The male (DG/WH/DG, AL/OR) remained the same as in 2020 and the female (DB/DB/WH, AL/(LB)) remained the same since 2019. Matt Kline, Emma Belling and other DWR staff monitored this four-egg clutch and CCB banded two nestlings at day 8 (physical age) on 14 May. The cavity was monitored more frequently than last year and several young birds from Piney Grove were often observed antagonistically interacting with the breeding pair while nestlings were in the cavity. The cavity was checked on 26 May and a flying squirrel was observed in the nest. This squirrel was later removed and one of the nestling's leg bands was recovered, confirming that this was a depredated nest. This is likely the second year in a row that flying squirrels depredated the Big Woods nest and multiple squirrels remain in another cavity at the cluster. Unfortunately, the cavity that the squirrels use has two entrances, complicating removal.

Population Monitoring

During the calendar year of 2021, 107 individual red-cockaded woodpeckers were identified within Piney Grove Preserve/Big Woods (Tables 2,3,4). This included 75 birds that were hatched at Piney Grove during previous years and 32 nestlings that fledged during the 2021 breeding season. Seventeen birds that were produced during the 2020 breeding season were still present in the population. Forty-two birds (39%) were in their fourth year (fifth calendar year) or more and thirteen birds (12%) were at least in their tenth year (eleventh calendar year). One bird was fifteen years old (sixteenth calendar year).

There were 28 birds detected in 2020 that were not detected in 2021. This includes the loss of 14 adults hatched prior to 2020 and 14 birds hatched in 2020. Seven of the breeding adults from 2020 were replaced in 2021 including the female from cluster 1, the female and male from cluster 6, the female and male from cluster 12, the male from cluster 17, and the female from cluster 19. There was also a newly formed pair at cluster 8.

Moving into the breeding season there were 66 birds identified within Piney Grove Preserve distributed among 16 clusters including C-1, C-3, C-5, C-6, C-7, C-8, C-10, C-11, C-12, C-13, C-15, C-17, C-18, C-19, C-20, and Big Woods. This is one fewer than the number of adults that Piney Grove carried into the breeding season in 2020 and one more than in 2019. The number of birds per cluster varied from two to eight with a mean of 4.13 ±0.47 (mean±SE). Cluster 17 and the Big Woods had only the breeding pair present moving into the breeding season. Clusters 5 carried the most birds (8), followed by cluster 7(7)

Eighty-one birds were detected during the 2021 winter survey (Table 4). This represents a 1% increase over the 2020 winter survey and a 5% increase over the 2019 winter survey (81 vs 80 vs 77). Birds present include 19 of the 32 birds fledged in 2021 and 62 adult birds hatched in previous years. There were 12 adult birds detected during the spring survey that were not detected during winter survey.

During the winter survey, birds were associated with 16 different cluster areas including C-1, C-3, C-5, C-6, C-7, C-8, C-10, C-11, C-12, C-13, C-15, C17, C-18, C-19, C-20, and Big Woods. In years past, the birds roosting in cluster 9 actively foraged with the birds from cluster 7 so were treated as one functional group. This unit appears to be splitting but individuals still mix between the two groups and they forage in close proximity so we are continuing to treat these as an individual cluster. Group size in winter ranged from three to nine birds and averaged 5.06±0.41 (mean ± SE) birds per group. Cluster 7 supported nine birds and Cluster 1 supported eight birds.

Table 3. Individual red-cockaded woodpecker sightings during the 2021 spring survey within Piney Grove Preserve. Bold band colors between parentheses represent bands lost.

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Spring Cluster
2421-02916	AL/OR	LG/DB/LG	F	2015	1
2421-02944	LB/WH/OR	AL/DG	F	2016	1
1581-66270	DG/(YE)/DG	WH/AL	M	2006	1
2421-01606	AL/DB	YE/DG/YE	F	2020	1
2421-01608	YE/DG/YE	AL/RE	M	2020	1
901-29856	DG/YE/DG	AL/YE	F	2019	1
2421-02910	AL/WH	DB/RE/DB	M	2014	3
901-29851	OR/DG/OR	AL/LB	M	2015	3
901-29859	RE/AL	DB/RE/DB	F	2019	3
901-29889	RE/DB/RE	AL/OR	F	2020	3
821-70952	YE/(OR)/(YE)	AL/YE	F	2012	3
901-29890	AL/LB	RE/DB/RE	F	2020	3
2421-02903	WH/OR/OR	AL/LB	F	2014	5
2421-02949	LB/YE/(DG)	AL/LG	M	2016	5
2421-02999	DB/RE/DB	AL/YE	F	2018	5
901-29879	WH/LB/WH	AL/RE	F	2019	5
2421-01602	AL/LG	LB/WH/LB	M	2018	5
1581-66288	LB/WH/LB	AL/DG	M	2008	5
Unbanded	Unbanded	Unbanded	U	2020	5
821-70983	AL/WH	WH/(LB)/WH	F	2013	5
2421-02975	WH/DB/YE	PK/AL	M	2017	6
2421-01614	DB/WH/DB	AL/RE	F	2020	6

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Spring Cluster
RE/YE/RE	RE/YE/RE	AL/DB	F	2020	6
2421-02948	DB/WH/YE	AL/DB	F	2016	7
2421-02943	DB/LG/YE	AL/DB	M	2016	7
821-70901	OR/OR/OR	AL/DG	M	2009	7
821-70953	OR/YE/YE(rev)	AL/LG	F	2012	7
2421-02914	AL/(DB)	WH/(PU)/WH	M	2015	7
2421-02982	OR/AL(rev)	WH/RE/WH	F	2018	7
901-29854	DG/AL	WH/RE/WH	F	2019	7
2421-02966	BK/(OR)/DB	HP/AL	M	2017	8
2421-02977	OR/DB/LB	HP/AL	F	2017	8
1581-66278	LB/WH/LB	(OR)/AL	F	2007	8
2421-02942	LG/YE/WH	AL/LB	M	2016	8
901-29888	AL/HP	RE/WH/RE	F	2020	8
2421-02985	LB/AL (rev)	WH/RE/WH	M	2018	8 & 7
2421-02941	LB/DB/OR	AL/DG	F	2016	10
2421-02929	OR/WH/OR	AL/DB	M	2015	10
901-29857	DG/YE/DG	OR/AL	F	2019	10
901-29896	OR/OR/OR	AL/YE	M	2020	10
2421-02981	LB/DB/OR (rev)	HP/AL	F	2017	11
821-70935	(OR)/(DB)/(OR)	AL/(DB)	F	2011	11
821-70919	YE/DB/YE	LB/AL	M	2011	11
2421-02970	LG/DB/LB	HP/AL	M	2017	11
2421-01607	YE/DG/YE	AL/WH	F	2020	11 & 1
2421-01621	AL/LB	RE/YE/RE	M	2020	12

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Spring Cluster
2421-02931	LG/LG/LG	AL/YE	M	2015	12
2421-02959	GY/DB/LB	HP/AL	F	2017	12
2421-02905	AL/LG	WH/(PU)/WH	F	2014	13
2421-01609	YE/OR/YE	AL/DG	M	2020	13
1581-66274	WH/RE/WH	AL/DB	M	2007	13
2421-02964	WH/DB/OR	(HP)/AL	M	2017	13
821-70929	(OR)/YE/YE(rev)	AL/WH	M	2011	13
821-70933	LB/WH/WH	(PU)/AL	F	2011	15
821-70906	AL/(RE)	(YE)/(DB)/(YE)	M	2010	15
2421-01613	DB/OR/DB	AL/YE	M	2020	15
821-70965	AL/(LG)	YE/YE/(DB)	F	2013	17
901-29853	WH/RE/WH	YE/AL	M	2019	17
821-70923	YE/(LG)/(LG)	AL/WH	M	2011	18
2421-02952	LG/YE/LB	AL/YE	F	2016	18
901-29855	WH/AL	WH/RE/WH	M	2019	18
2421-01605	Al/DB	OR/OR/OR	F	2018	19
2421-02945	AL/LB	LG/OR/WH	F	2016	19
821-70936	OR/DB/OR	AL/LG	M	2011	19
2421-02939	DB/DB/WH	AL/(LB)	F	2016	bw1
2421-02987	DG/WH/DG	AL/OR	M	2018	bw1

Table 4. Individual red-cockaded woodpecker sightings during the 2021 winter survey within Piney Grove Preserve. Bold band colors between parentheses represent bands lost.

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Winter Cluster
1581-66270	DG/YE/DG	WH/AL	M	2006	1
2421-01604	DG/(YE)/DG	DB/AL	M	2018	1
2421-01608	YE/DG/YE	AL/RE	M	2020	1
2421-02944	LB/WH/OR	AL/DG	F	2016	1
901-29856	DG/YE/DG	AL/YE	F	2019	1
901-29886	RE/WH/RE	AL/OR	F	2020	1
2421-01638	AL/LB	DG/YE/DG	F	2021	1
2421-01636	AL/RE	DG/YE/DG	M	2021	1
2421-02910	AL/WH	DB/RE/DB	M	2014	3
821-70952	YE/(OR)/(YE)	AL/YE	F	2012	3
901-29859	RE/AL	DB/RE/DB	F	2019	3
2421-01640	DB/RE/DB	AL/DG	F	2021	3
2421-01641	RE/DB/RE	AL/LB	F	2021	3
1581-66288	LB/WH/LB	AL/DG	M	2008	5
2421-01602	AL/LG	LB/WH/LB	M	2018	5
2421-02903	WH/OR/OR	AL/LB	F	2014	5
2421-02999	DB/RE/DB	AL/YE	F	2018	5
901-29894	WH/YE/WH	AL/DB	F	2020	5
Unbanded	Unbanded	Unbanded	U	2020	5
2421-01614	DB/WH/DB	AL/RE	F	2020	6
2421-02975	WH/DB/YE	PK/AL	M	2017	6
2421-02981	LB/DB/OR (rev)	HP/AL	F	2017	6

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Winter Cluster
RE/YE/RE	RE/YE/RE	AL/DB	F	2020	6
2421-01655	WH/DB/WH	AL/DG	F	2021	6
2421-01656	AL/DB	WH/DB/WH	M	2021	6
2421-02948	DB/WH/YE	AL/DB	F	2016	7
901-29854	DG/AL	WH/RE/WH	F	2019	7
2421-01657	RE/BK/RE	AL/RE	M	2021	7
2421-01659	AL/RE	RE/BK/RE	M	2021	7
2421-02914	AL/(DB)	WH/(PU)/WH	M	2015	7(9)
2421-02943	DB/(LG)/YE	AL/DB	M	2016	7(9)
2421-02982	OR/AL(rev)	WH/RE/WH	F	2018	7(9)
821-70901	OR/OR/OR	AL/DG	M	2009	7(9)
821-70953	OR/YE/YE(rev)	AL/LG	F	2012	7(9)
2421-02966	BK/(OR)/DB	HP/AL	M	2017	8
2421-02977	OR/DB/LB	HP/AL	F	2017	8
2421-01646	AL/DG	DB/YE/DB	M	2021	8
2421-01606	AL/DB	YE/DG/YE	F	2020	10
2421-02929	OR/WH/OR	AL/DB	M	2015	10
2421-02941	LB/DB/OR	AL/DG	F	2016	10
2421-01651	AL/RE	OR/OR/OR	F	2021	10
901-29896	OR/OR/OR	AL/YE	M	2020	10
2421-02970	LG/DB/LB	HP/AL	M	2017	11
821-70919	YE/DB/YE	LB/AL	M	2011	11
821-70935	(OR)/(DB)/(OR)	AL/(DB)	F	2011	11
901-29890	AL/LB	(RE)/DB/RE	F	2020	11

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Winter Cluster
2421-02931	(LG)/(LG)/LG	AL/YE	M	2015	12
821-70988	WH/LB/(WH)	AL/(YE) (2)	F	2014	12
2421-01621	AL/LB	RE/YE/RE	M	2020	12
2421-01643	AL/OR	YE/RE/YE	M	2021	12
1581-66274	WH/RE/WH	AL/DB	M	2007	13
1581-66297	AL/(RE)	LG/YE/DG	F	2009	13
821-70929	(OR)/YE/YE(rev)	AL/WH	M	2011	13
901-29876	OR/YE/OR	LB/AL	M	2019	13
2421-01654	OR/YE/OR	AL/YE	M	2021	13
2421-01613	DB/OR/DB	AL/YE	M	2020	15
821-70906	AL/(RE)	(YE)/(DB)/(YE)	M	2010	15
821-70933	LB/WH/WH	(PU)/AL	F	2011	15
2421-01652	AL/DG	DB/OR/DB	M	2021	15
821-70965	AL/(LG)	YE/YE/(DB)	F	2013	17
901-29853	WH/RE/WH	YE/AL	M	2019	17
2421-01630	DG/BK/DG	AL/DB	F	2021	17
2421-02952	LG/YE/LB	AL/YE	F	2016	18
821-70923	YE/(LG)/(LG)	AL/WH	M	2011	18
901-29855	WH/AL	WH/RE/WH	M	2019	18
2421-01625	AL/OR	RE/DG/RE	M	2021	18
2421-01605	Al/DB	OR/OR/OR	F	2018	19
2421-02945	AL/LB	LG/OR/WH	F	2016	19
821-70936	OR/(DB)/OR	AL/LG	M	2011	19
2421-01627	WH/YE/WH	AL/LB	F	2021	19

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Winter Cluster
2421-01628	AL/OR	WH/YE/WH	F	2021	19
2421-01645	DB/YE/DB	AL/DB	M	2021	19
2421-02942	LG/YE/WH	AL/LB	M	2016	20
2421-02949	LB/YE/(DG)	AL/LG	M	2016	20
901-29864	YE/DB/YE	AL/RE	M	2019	20
901-29888	AL/HP	RE/WH/RE	F	2020	20
2421-01647	AL/OR	DB/LB/DB	F	2021	20
2421-01607	YE/DG/YE	AL/WH	M	2020	bw1
2421-02939	DB/DB/WH	AL/(LB)	F	2016	bw1
2421-02964	WH/DB/OR	(HP)/AL	M	2017	bw1
Unbanded	Unbanded	Unbanded	U	2020	bw1

Trees and Cavities

A total of 307 woodpecker cavity trees supporting 359 cavities were known and still standing during 2021 at Piney Grove Preserve and another 12 cavities in 9 trees at Big Woods (Appendix I). The total at Piney Grove includes 278 natural cavities and 81 artificial inserts. Of the 278 natural cavities 107 (37.7%) were starts in various stages of completion and 8 (3%) had healed over the cavity entrance. Of the 163 completed natural cavities, 71 (43.6%) were considered active in December. Of the 81 artificial inserts, 7 (8.6%) were considered active in December. The total at Big Woods includes six natural cavities, five inserts, and one drilled cavity. Two of the Big Woods natural cavities were complete and one of those cavities was active.

ACKNOWLEDGMENTS

This project received assistance from many individuals during 2021. Brian van Eerden and Bobby Clontz from The Nature Conservancy provided logistical support and administrative oversight as well as assistance in the field. Emma Belling, Sergio Harding and Matthew Kline monitored the cluster within the Big Woods. Funding for all demographic monitoring and cavity management during the breeding season was provided by the Virginia Chapter of The Nature Conservancy and The Center for Conservation Biology at William & Mary. The winter survey is supported with funds provided by the Virginia Department of Wildlife Resources through a Federal Aid in Wildlife Resources Grant from the U.S. Fish and Wildlife Service. Thanks to Sergio Harding for his direct assistance with funds from DWR. Marie Pitts assisted with report production. We also thank Erica Lawler and Jane Lopez of the Sponsored Programs Office at William & Mary for their administrative assistance.

LITERATURE CITED

Bailey, H. H. 1913. The birds of Virginia. J. P. Bell Company, Lynchburg, VA.

Beck, R. A. 1991. Red-cockaded woodpecker. Pages 513-514 *in* K. Terwilliger (ed.) Virginia's Endangered Species: Proceedings of a symposium. McDonald and Woodward Publishing Company, Blacksburg, VA.

Bradshaw, D. S. 1990. Habitat quality and seasonal foraging patterns of the red-cockaded woodpecker (*Picoides borealis*) in southeastern Virginia. M.A. Thesis, College of William and Mary, Williamsburg, Va.

Byrd, M. A. 1979. Red-cockaded woodpecker. Pages 425-427 *in* D. W. Linzey (ed.) Endangered and threatened plants and animals of Virginia. Blacksburg Center for Environmental Studies, Virginia Polytechnic Institute and State University. Blacksburg, VA.

Jackson, J. A. 1994. Red-cockaded woodpecker (*Picoides borealis*). In A. Poole and F. Gill (eds.)The Birds of North America, No. 85. The Academy of Natural Sciences, Philadelphia and The American Ornithologists' Union, Washington, D.C.

Miller, G. L. 1978. The population, habitat, behavioral and foraging ecology of the red-cockaded woodpecker (*Picoides borealis*) in southeastern Virginia. M.A. Thesis, College of William and Mary, Williamsburg, VA.

Murray, J. J. 1952. A check-list of the birds of Virginia. Virginia Society of Ornithology. Virginia Avifauna No. 1.

Rives, W. C. 1890. A Catalogue of the Birds of the Virginias. Proceedings of the Newport Natural History Society. Newport, Rhode Island.

Steirly, C. C. 1949. A note on the red-cockaded woodpecker. Raven 20:6-7.

Steirly, C. C. 1950. Nest cavities of the red-cockaded woodpecker. Raven 21:2-3.

Steirly, C. C. 1957. Nesting ecology of the red-cockaded woodpecker. Atl. Nat. 12:280-292.

Sykes, P. W., Jr. 1960. Recent nesting of the red-cockaded woodpecker in the Norfolk area. Raven 31:107-108.

Virginia Department of Game and inland Fisheries. 2005. Virginia's comprehensive wildlife conservation strategy. Virginia Department of Game and inland Fisheries, Richmond, VA.

Watts, B. D. and D. S. Bradshaw. 2005. Decline and protection of the Virginia red-cockaded woodpecker population. *In* R. Costa and S. J. Daniels (eds.) Red-cockaded woodpecker: road to recovery. Hancock House Publishers, Blain, Washington, USA.

Watts, B. D. and S. R. Harding. 2007. Virginia Red-cockaded Woodpecker Conservation Plan. Center for Conservation Biology Technical Report Series, CCBTR-07-07. College of William and Mary, Williamsburg, VA. 42 pp.

Watts, B. D., F. M. Smith, B. J. Paxton, C. Hines, and L. Duval. 2018. Investigation of Red-cockaded Woodpeckers in Virginia: Year 2018 report. Center for Conservation Biology Technical Report Series, CCBTR-18-17. College of William and Mary and Virginia Commonwealth University, Williamsburg, VA. 33 pp.

APPENDICES

Appendix I. Status of red-cockaded woodpecker cavity trees at the Piney Grove Preserve in 2021.

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
1	34	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	36	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Old/None
1	37	a	Loblolly	Live	Natural	Inactive	Start (Fr)	<2x	Unstarted	Old/None
1	42	a	Loblolly	Live	Natural	Relic	Healed over	NA	Unstarted	Old/None
1	43	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Old/None
1	44	a	Loblolly	Dead	Natural	Relic	Complete	NA	Unstarted	Old/None
1	44	b	Loblolly	Dead	Natural	Relic	Start (Adv)	NA	Unstarted	Old/None
1	46	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
1	48	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	49	a	Loblolly	Live	Natural	Relic	Healed over	Normal	Unstarted	Old/None
1	52	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
1	54	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	54	b	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Old/None
1	55	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	55	b	Loblolly	Live	Natural	Relic	Complete	2-4x	Unstarted	Old/None
1	55	c	Loblolly	Live	Natural	Relic	Complete	2-4x	Unstarted	Old/None
1	57	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	58	a	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Unstarted	Old/None
1	58	b	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Recent
1	58	c	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Fresh
1	59	a	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Unstarted	Old/None
1	59	b	Loblolly	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Old/None
1	117	a	Loblolly	Live	Artificial	Inactive	Insert	Healing	Unstarted	Old/None

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
1	117	b	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
1	212	a	Shortleaf	Dying	Natural	Inactive	Complete	<2x	incomplete	Old/None
1	213	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Unstarted	Old/None
1	225	a	Shortleaf	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	241	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Incomplete	Recent
1	242	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
1	257	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Incomplete	Fresh
1	257	b	Loblolly	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Old/None
1	273	a	Shortleaf	Live	Natural	Active	Complete	2-4x	Unstarted	Fresh
1	305	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
1	307	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
1	323	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
1	1NT1	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
1	1NT2	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Unstarted	Recent
1	1NT3	a	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
1	1NT4	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Fresh
1	1NT5	a	Shortleaf	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Old/None
1	1NT6	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Old/None
2	60	a	Loblolly	Live	Artificial	Relic	Insert	NA	Unstarted	Old/None
2	63	a	Loblolly	Live	Artificial	Relic	Insert	NA	Unstarted	Old/None
3	2	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
3	6	a	Loblolly	Live	Natural	Relic	Start (Adv)	Normal	Unstarted	Old/None
3	7	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Old/None
3	8	a	Loblolly	Live	Natural	Inactive	Complete	<2x	Complete	Old/None
3	9	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Old/None
3	72	a	Loblolly	Live	Natural	Relic	Complete	Healing	Unstarted	Old/None
3	75	a	Loblolly	Live	Natural	Relic	Healed over	Healing	Unstarted	Old/None
3	76	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Unstarted	Old/None

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
3	79	a	Loblolly	Live	Artificial	Inactive	Insert	Healing	Unstarted	Old/None
3	80	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
3	128	a	Loblolly	Live	Natural	Unknown	Complete	<2x	Incomplete	Recent
3	177	a	Loblolly	Live	Natural	Relic	healed over	NA	Unstarted	Old/None
3	178	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
3	179	a	Loblolly	Live	Natural	Active	Complete	<2x	Complete	Fresh
3	180	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
3	208	a	Loblolly	Live	Natural	Relic	Complete	Normal	Unstarted	Old/None
3	258	a	Loblolly	Live	Natural	Unknown	Complete	<2x	Incomplete	Fresh
3	259	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
3	289	a	Loblolly	Live	Natural	Relic	Start (Adv)	<2x	Unstarted	Old/None
3	313	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
3	314	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
3	314	b	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
3	3NT1	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
3	3NT2	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Old/None
3	3NT3	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
4	82	a	Loblolly	Live	Artificial	Unknown	Insert	Normal	Complete	Old/None
4	84	a	Loblolly	Live	Artificial	Relic	Insert	Healing	Unstarted	Old/None
4	186	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
5	14	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Recent
5	15	a	Loblolly	Live	Natural	Active	Complete	2-4x	Complete	Recent
5	17	a	Loblolly	Live	Natural	Unknown	Complete	Normal	Complete	Recent
5	18	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
5	19	a	Loblolly	Live	Natural	Relic	Healed over	Normal	Unstarted	Old/None
5	19	b	Loblolly	Live	Natural	Relic	Healed over	Normal	Unstarted	Old/None
5	19	c	Loblolly	Live	Natural	Relic	Healed over	Normal	Unstarted	Old/None
5	22	a	Loblolly	Live	Artificial	Relic	Insert	Healing	Unstarted	Old/None

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
5	24	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
5	24	b	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
5	24	c	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
5	25	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Old/None
5	26	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
5	28	a	Loblolly	Live	Natural	Relic	Complete	NA	Unstarted	Old/None
5	28	b	Loblolly	Live	Natural	Inactive	Complete	Normal	Unstarted	Old/None
5	30	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
5	92	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Healing	Unstarted	Old/None
5	94	a	Loblolly	Live	Artificial	Relic	Insert	NA	Complete	Old/None
5	95	a	Loblolly	Live	Artificial	Relic	Insert	NA	Unstarted	Old/None
5	127	a	Loblolly	Live	Natural	Relic	healed over	Healing	Unstarted	Old/None
5	191	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
5	217	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Incomplete	Old/None
5	218	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
5	236	a	Loblolly	Live	Natural	Active	Complete	<2x	Complete	Fresh
5	237	a	Loblolly	Live	Natural	Relic	Complete	Normal	Unstarted	Recent
5	248	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Incomplete	Old/None
5	260	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
5	261	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
5	262	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Recent
5	290	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
5	290	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Fresh
5	323	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
5	338	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
5	340	a	Loblolly	Live	Natural	Unknown	Complete	Normal	incomplete	Fresh
5	341	a	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
5	5NT1	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
5	5NT2	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Incomplete	Old/None
6	10	a	Loblolly	Live	Artificial	Relic	Insert	Healing	Incomplete	Old/None
6	33	a	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Unstarted	Fresh
6	33	b	Loblolly	Live	Natural	Inactive	Start (Fr)	2-4x	Unstarted	Fresh
6	33	c	Loblolly	Live	Natural	Inactive	Start (Fr)	2-4x	Unstarted	Fresh
6	116	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Fresh
6	135	a	Loblolly	Live	Natural	Inactive	Start (Adv)	>4x	Unstarted	Old/None
6	135	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
6	135	c	Loblolly	Live	Artificial	Unknown	Insert	Normal	Unstarted	Old/None
6	136	a	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Complete	Old/None
6	136	b	Loblolly	Live	Natural	Inactive	Start (Fr)	2-4x	Complete	Old/None
6	136	c	Loblolly	Live	Natural	Inactive	Start (Fr)	>4x	Complete	Old/None
6	137	a	Loblolly	Live	Artificial	Unknown	Insert	Normal	Complete	Recent
6	139	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
6	139	b	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Complete	Recent
6	166	a	Loblolly	Live	Artificial	Unknown	Insert	Normal	Incomplete	Old/None
6	199	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Recent
6	200	a	Loblolly	Live	Artificial	Unknown	Insert	<2x	Incomplete	Old/None
6	206	a	Loblolly	Live	Natural	Inactive	Start (Adv)	>4x	Incomplete	Old/None
6	233	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Unstarted	Recent
6	233	b	Loblolly	Live	Natural	Inactive	Complete	>4x	Unstarted	Recent
6	234	a	Loblolly	Live	Natural	*Inactive*	Start (Adv)	Normal	Unstarted	Old/None
6	234	b	Loblolly	Live	Natural	*Inactive*	Start (Fr)	Normal	Unstarted	Old/None
6	234	c	Loblolly	Live	Natural	*Inactive*	Start (Fr)	Normal	Unstarted	Old/None
6	234	d	Loblolly	Live	Natural	*Inactive*	Start (Adv)	Normal	Unstarted	Old/None
6	234	e	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
6	234	f	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
6	234	g	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
6	235	a	Loblolly	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Recent
6	235	b	Loblolly	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Recent
6	256	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Complete	Recent
6	256	b	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Recent
6	268	a	Loblolly	Live	Natural	Inactive	Complete	<2x	Complete	Recent
6	315	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
6	318	a	Loblolly	Live	Natural	Active	Complete	<2x	Incomplete	Fresh
6	332	a	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
6	6NT1	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Complete	Fresh
6	6NT2	a	Loblolly	Live	Natural	Inactive	Start (Fr)		Unstarted	Old/None
6	6NT3	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Fresh
6	6NT4	a	Loblolly	Live	Natural	Inactive	Start (Fr)		Unstarted	Old/None
7	105	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
7	106	a	Loblolly	Live	Natural	Relic	Complete	>4x	Complete	Old/None
7	106	b	Loblolly	Live	Natural	Relic	Start (Fr)	Normal	Complete	Old/None
7	106	c	Loblolly	Live	Natural	Relic	Start (Fr)	Normal	Complete	Old/None
7	108	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
7	109	a	Loblolly	Live	Natural	Inactive	Complete	<2x	Complete	Fresh
7	109	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Fresh
7	110	a	Loblolly	Dead	Artificial	Relic	Insert	Normal	Incomplete	Old/None
7	111	a	Unknown	Dead	Artificial	Relic	Insert	Normal	Unstarted	Old/None
7	195	a	Loblolly	Live	Artificial	Relic	healed over	Healing	Unstarted	Old/None
7	216	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
7	243	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
7	253	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Fresh
7	272	a	Loblolly	Live	Natural	Inactive	Complete	>4x	incomplete	Old/None
7	275	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Recent
7	276	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Recent

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
7	277	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
7	284	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
7	297	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
7	298	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
7	299	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
7	300	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Incomplete	Recent
7	330	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
7	7NT1	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
7	7NT2	a	Loblolly	Live	Natural	Unknown	Start (Fr)	Normal	Unstarted	Recent
7	7NT3	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	*Fresh*
7	7NT4	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
7	7NT5	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
7	7NT6	a	Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Unstarted	Fresh
7	7NT7	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
8	129	a	Loblolly	Live	Natural	Inactive	Complete	<2x	Unstarted	Recent
8	155	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Unstarted	Old/None
8	170	a	Loblolly	Live	Artificial	Relic	Insert	Normal	Complete	Old/None
8	171	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
8	173	a	Loblolly	Live	Artificial	Inactive	Complete	Normal	Unstarted	Old/None
8	175	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Incomplete	Old/None
8	176	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Incomplete	Old/None
8	176	b	Loblolly	Live	Natural	Inactive	Complete	2-4x	Incomplete	Old/None
8	209	a	Loblolly	Live	Natural	Relic	Complete	2-4x	Complete	Old/None
8	209	b	Loblolly	Live	Natural	Relic	Start (Adv)	Healing	Complete	Old/None
8	210	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Unstarted	Old/None
8	211	a	Loblolly	Live	Artificial	Unknown	Insert	<2x	Unstarted	Old/None
8	219	a	Loblolly	Live	Natural	Inactive	Complete	<2x	Incomplete	Recent
8	220	a	Loblolly	Live	Natural	Active	Complete	<2x	Complete	Fresh

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
8	226	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Incomplete	Recent
8	227	a	Loblolly	Live	Natural	Inactive	Complete	Healing	Unstarted	Old/None
8	228	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
8	229	a	Loblolly	Live	Natural	Relic	Start (Adv)	<2x	Unstarted	Old/None
8	230	a	Loblolly	Live	Natural	Unknown	Complete	Normal	Complete	Fresh
8	231	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Recent
8	286	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
8	287	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
8	288	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Incomplete	Recent
8	310	a	Loblolly	Live	Natural	Unknown	Complete	Normal	Incomplete	Old/None
8	321	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
8	339	a	Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Complete	Recent
8	809	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
8	8NT1	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Complete	Recent
8	8NT2	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Complete	Recent
8	8NT3	a	Loblolly	Live	Natural	Inactive	Complete	<2x	Unstarted	Fresh
8	8NT4	a	Loblolly	Live	Natural	Unknown	Start (Adv)	<2x	Unstarted	Old/None
9	85	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
9	86	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
9	87	a	Loblolly	Live	Artificial	Active	Insert	Normal	Complete	Fresh
9	88	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
10	64	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
10	65	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
10	66	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
10	68	a	Loblolly	Live	Natural	Inactive	Start (Fr)	<2x	Unstarted	Old/None
10	150	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
10	154	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Unstarted	Old/None
10	156	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Old/None

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
10	157	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
10	214	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
10	247	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
10	274	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
10	301	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
10	302	a	Loblolly	Live	Natural	Active	Complete	<2x	Incomplete	Fresh
10	303	a	Shortleaf	Live	Natural	Active	Complete	<2x	Incomplete	Fresh
10	325	a	Loblolly	Live	Natural	Unknown	Complete	2-4x	Incomplete	Recent
10	329	a	Shortleaf	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
10	10NT1	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Old/None
10	10NT2	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Fresh
10	10NT3	a	Loblolly	Live	Natural	Relic	Complete	<2x	Unstarted	Old/None
10	10NT3	b	Loblolly	Live	Natural	Relic	Start (Adv)	Normal	Unstarted	Old/None
11	140	a	Loblolly	Live	Artificial	Relic	Insert	Healing	Complete	Old/None
11	141	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
11	142	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
11	143	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
11	238	a	Loblolly	Live	Natural	Unknown	Complete	2-4x	Complete	Fresh
11	239	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Old/None
11	240	a	Loblolly	Live	Natural	Unknown	Complete	Normal	Complete	Fresh
11	269	a	Loblolly	Live	Natural	Active	Complete	<2x	Complete	Recent
11	270	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
11	285	a	Loblolly	Live	Natural	Active	Complete	Normal	*Complete*	Fresh
11	291	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
11	292	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
11	293	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
11	294	a	Loblolly	Live	Natural	Unknown	Complete	2-4x	Unstarted	Recent
11	327	a	Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Unstarted	Fresh

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
11	328	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
11	337	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
11	342	a	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
11	11NT1	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
12	131	a	Loblolly	Live	Artificial	Inactive	Insert	Healing	Unstarted	Fresh
12	132	a	Loblolly	Live	Artificial	Inactive	Insert	Healing	Unstarted	Old/None
12	133	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
12	158	a	Shortleaf	Dead	Artificial	Relic	Insert	Normal	Unstarted	Old/None
12	159	a	Loblolly	Live	Artificial	Active	Insert	Normal	Incomplete	Fresh
12	189	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
12	244	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Unstarted	Recent
12	244	b	Loblolly	Live	Natural	inactive	Start (Adv)	Normal	Unstarted	Recent
12	244	c	Loblolly	Live	Natural	Inactive	Complete	>4x	Unstarted	Old/None
12	266	a	Shortleaf	Live	Natural	Inactive	Complete	>4x	Incomplete	Old/None
12	267	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
12	295	a	Loblolly	Live	Natural	Active	Complete	2-4x	Incomplete	Recent
12	296	a	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Unstarted	Old/None
12	296	b	Loblolly	Live	Natural	Inactive	Start (Fr)	2-4x	Unstarted	Old/None
12	296	c	Loblolly	Live	Natural	inactive	Start (Fr)	2-4x	Unstarted	Old/None
12	296	d	Loblolly	Live	Natural	Inactive	Start (Fr)	2-4x	Unstarted	Old/None
12	316	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
12	317	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Incomplete	Fresh
12	334	a	Shortleaf	Live	Natural	Inactive	Complete	2-4x	Unstarted	Recent
12	12NT1	a	Loblolly	Live	Natural	Inactive	Start (Adv)	>4x	Incomplete	Old/None
12	12NT1	b	Loblolly	Live	Natural	Inactive	Start (Adv)	>4x	Incomplete	Old/None
12	12NT1	c	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Incomplete	Old/None
13	119	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Recent
13	120	a	Loblolly	Live	Artificial	Unknown	Insert	Normal	Unstarted	Old/None

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
13	121	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Recent
13	122	a	Loblolly	Live	Artificial	Inactive	Insert	2-4x	Unstarted	Old/None
13	123	a	Loblolly	Live	Artificial	Relic	Insert	Healing	unstarted	Old/None
13	124	a	Loblolly	Live	Artificial	Relic	Insert	healing	Complete	Old/None
13	144	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
13	145	a	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Unstarted	Recent
13	168	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
13	169	a	Loblolly	Live	Artificial	Unknown	Insert	Normal	Unstarted	Recent
13	271	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
13	311	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
13	312	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
13	13NT1	a	Loblolly	Live	Natural	Active	Complete	grown over	Unstarted	Fresh
13	13NT2	a	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
14	88	a	Loblolly	Live	Natural	Inactive	Start (Fr)	<2x	Unstarted	Old/None
14	89	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
14	91	a	Loblolly	Live	Artificial	Relic	Insert	Healing	Unstarted	Old/None
14	100	a	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Unstarted	Old/None
14	101	a	Loblolly	Live	Natural	Inactive	Complete	<2x	Unstarted	Old/None
15	160	a	Loblolly	Live	Artificial	Relic	Insert	>4x	Unstarted	Old/None
15	161	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
15	162	a	Loblolly	Live	Artificial	Unknown	Insert	Normal	Unstarted	Old/None
15	163	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
15	187	a	Loblolly	Live	Artificial	Inactive	Insert	Healing	Unstarted	Old/None
15	198	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
15	205	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Recent
15	205	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
15	205	c	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Recent
15	221	a	Loblolly	Live	Natural	Unknown	Complete	Normal	Complete	Fresh

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
15	264	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
15	265	a	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
15	265	b	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Old/None
15	308	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
15	309	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
15	15NT1	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
15	15NT2	a	Loblolly	Live	Natural	Inactive	Start (Fr)	<2x	Unstarted	Old/None
16	167	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
16	16NT1	a	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Unstarted	Old/None
16	16NT2	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Old/None
16	16NT2	b	Loblolly	Live	Natural	Inactive	Start (Fr)	2-4x	Unstarted	Old/None
17	146	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Incomplete	Old/None
17	147	a	Loblolly	Live	Artificial	Relic	Insert	grown over	Unstarted	Old/None
17	249	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Recent
17	250	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
17	251	a	Loblolly	Live	Artificial	inactive	Insert	Normal	Unstarted	Old/None
17	252	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
17	283	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Incomplete	Recent
17	283	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Fresh
17	319	a	Loblolly	Live	Natural	Active	Complete	2-4x	Incomplete	Fresh
17	336	a	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
18	181	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Recent
18	182	a	Loblolly	Live	Artificial	Relic	Insert	Healing	Unstarted	Old/None
18	183	a	Loblolly	Live	Artificial	Relic	Insert	Healing	Unstarted	Old/None
18	184	a	Loblolly	Live	Artificial	Relic	Insert	Healing	Unstarted	Old/None
18	207	a	Shortleaf	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
18	254	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Recent
18	254	b	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Recent

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
18	278	a	Loblolly	Live	Artificial	Active	Insert	Normal	Incomplete	Fresh
18	279	a	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
18	280	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Fresh
18	281	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
18	324	a	Shortleaf	Live	Natural	Inactive	Complete	2-4x	Complete	Recent
18	331	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
18	18NT1	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Recent
18	18NT2	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
19	322	a	Loblolly	Live	Natural	Active	Complete	<2x	Complete	Fresh
19	333	a	Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
19	134	a	Loblolly	Live	Artificial	Active	Insert	Normal	Incomplete	Fresh
19	148	a	Loblolly	Live	Artificial	Active	Insert	Normal	Incomplete	Fresh
19	149	a	Loblolly	Live	Artificial	Active	Insert	Normal	Incomplete	Fresh
19	19NT1	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Old/None
19	19NT2	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Old/None
19	201	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
19	203	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
19	223	a	Loblolly	Live	Natural	Inactive	Complete	2-4x	Complete	Recent
19	223	b	Loblolly	Live	Natural	Inactive	Start (Adv)	2-4x	Unstarted	Recent
19	232	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Recent
19	245	a	Loblolly	Live	Natural	Unknown	Start (Adv)	2-4x	Unstarted	Recent
19	246	a	Loblolly	Live	Natural	Active	Complete	2-4x	Unstarted	Fresh
20	263	a	Loblolly	Live	Natural	Unknown	Complete	Normal	Complete	Fresh
20	320	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Recent
20	325	a	Loblolly	Live	Natural	Active	Complete	Normal	*Incomplete*	Fresh
20	20NT1	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Fresh
20	20NT2	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
20	20NT3	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent

Cluster	Tree	Cavity	Species	Condition	Type	Status	Cavity	Entrance	Plate	Resin Work
BW01	1	a	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Recent
BW01	1	b	Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
BW01	1	c	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
BW01	2	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Complete	Old/None
BW01	2	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
BW01	3	a	Loblolly	Live	Artifical	Inactive	Insert	Normal	Unstarted	Old/None
BW01	4	a	Loblolly	Live	Artifical	Active	Insert	Normal	Unstarted	Recent
BW01	BW01NT1	a	Loblolly	Live	Natural	Inactive	Start (Fr)	Normal	Unstarted	Recent
BW02	5	a	Loblolly	Live	Artifical	Inactive	Insert	Normal	Unstarted	None
BW02	6	a	Loblolly	Dead	Artifical	Inactive	Insert	Normal	Unstarted	None
BW02	7	a	Loblolly	Live	Artifical	Inactive	Insert	Normal	Unstarted	None
BW02	8	a	Loblolly	Live	Artifical	Inactive	Insert	Normal	Unstarted	None