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THE CENTER FOR CONSERVATION BIOLOGY

COLLEGE OF WILLIAM AND MARY

VIRGINIA COMMONWEALTH UNIVERSITY

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Front Cover Image: Chance Hines extracting woodpecker brood in cluster 15 for banding. Photo by Bryan Watts.

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.

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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 2019 breeding season, Piney Grove Preserve supported 15 potential breeding groups (including one in the Big Woods) that produced 27 fledglings. All groups made breeding attempts, including the cluster in Big Woods for the first time, though three clusters (10, 17, and 18) failed to produce fledglings. The population as a whole had a reproductive rate of 1.8±0.35 (mean±SE) young/breeding group. The 13 groups that made breeding attempts had a success rate of 80% (12 of 15). Fledging rate for the 12 productive pairs was 2.3±0.32. Of the 61 eggs followed in 2019, 40 (65.6%) hatched, 21 (55.7%) survived to banding age, and 28 (45.9%) fledged. Birds that fledged included 18 females, 9 males, and 1 of unknown sex. Fifteen of these birds were retained and detected during the winter count and two (both male) were translocated to Great Dismal Swamp, NWR on 17 October.

During the calendar year of 2019, 101 individual red-cockaded woodpeckers were identified within Piney Grove preserve including 72 birds that were hatched at Piney Grove during previous years and 29 nestlings that fledged during the 2019 breeding season. Forty-one birds (41%) were in their fourth year or more and ten birds (10%) were at least in their tenth year. One bird was fifteen years old (sixteenth calendar year).

Moving into the breeding season there were 65 birds were identified within Piney Grove Preserve distributed among 15 clusters. This ties 2017 as the highest number of adults that Piney Grove has ever carried into the breeding season. The number of birds per cluster varied from two to seven with a mean of 4.33±0.45 (mean+SE). Seventy-seven birds were detected during the 2018 winter survey. This represents a 5% increase over the winter of 2018 and a 13% increase over the winter of 2017. Birds present include 15 of the 29 birds fledged in 2017 and 62 adult birds hatched in previous years. Group size in winter ranged from two to nine birds and averaged 5.13 ± 0.56 (mean±SE) birds per group.

BACKGROUND

Context

The red-cockaded woodpecker (Picoides 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 Game and Inland Fisheries 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, 2016, 2017 and 2018 with the intent of establishing a second breeding population within the

state (Watts et al. 2019). 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 2019 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 clan of Red-cockaded Woodpeckers was discovered within this site in 1985. A second clan was discovered in 1994 and a third in 1995. These 3 clans 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. The birds are "roosted" and 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, 7 of these birds were still resident within Piney Grove. During 2000, Bryan Watts banded an additional 4 adult birds, leaving only 2 unbanded birds in the population (1 each in clusters 3 and 5). The 2 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 ft (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 clan 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.

Translocation

The U.S. Fish and Wildlife Service, the Virginia Department of Game & Inland Fisheries, and The Nature Conservancy, agreed in the spring of 2017 and again in the summers of 2018 and 2019 to attempt to move a pair of woodpeckers from Piney Grove Preserve to the Great Dismal Swamp National Wildlife Refuge. This decision was in support of ongoing efforts to establish a second breeding population in Virginia. Following the breeding season, we assessed possible donor clusters based on fledging results. Clusters that produced young were considered potential donors if they met criteria established in the national management plan. Clusters were considered to be potential donors of a male if 1) the cluster contained a hatching-year male at the time of anticipated translocation and 2) the group supported at least 1 additional helper male. Clusters were considered to be potential donors of a female if the group supported a hatching-year female at the time of anticipated translocation. Clusters were eliminated from the potential donor pool for logistical reasons if roost cavities were >50 feet (15.2 m). Selection of donor clusters for male and females were determined independently except that the pair would not be taken from the same cluster.

We roosted birds in September within potential donor clusters to determine retention of hatching-year birds and to identify target birds. Target birds and two backup birds were identified for possible translocation. Target and backup birds were roosted again during the first week of October in preparation for captures. We deployed two teams to capture birds prior to roosting during the night of the translocation. Birds were captured after entering cavities using pole nets. Once captured, birds were lowered to the ground and handled to confirm identification and gender. Birds were placed in transport boxes and driven to the Great Dismal Swamp, NWR for placement.

Birds were placed in artificial cavities, screened in for the night and released at dawn the following morning. We climbed recipient trees using Swedish climbing ladders, placed birds in artificial cavities and tacked screens over the entrance. A release team returned to the recruitment cluster before dawn the following morning. Screens were removed just after dawn and birds were allowed to fly out into their new habitat.

RESULTS

Breeding Observations

Piney Grove supported 15 potential breeding groups (including one in Big Woods) in 2019 that produced 27 fledglings (Table 1). All potential breeding groups made breeding. Clusters 15 and 18 each made two breeding attempts but only 15 succeeded on the second attempt. Cluster 10 and 17 failed in their breeding attempts, despite producing banding-aged nestlings (see details below). The population as a whole had a reproductive rate of 1.8±0.35 (mean ± SE) young/breeding group. The 15 groups that made breeding attempts had a success rate of 80% (12 of 15). Fledging rate for the 13 productive pairs was 2.3±0.33. Of the 61 eggs followed in 2018, 40 (65.6%) hatched, 40 (55.7%) survived to banding age, and 27 (44.3%) fledged (Table 1). Birds that fledged included 18 females and 9 males (Table 2). Fifteen of these birds were retained and detected during the winter count and two were translocated to Great Dismal Swamp, NWR.

Table 1. Summary of 2019 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	2	3	2	2
Cluster 3	Yes	Yes	4	3	3	2
Cluster 5	Yes	Yes	4	4	4	4
Cluster 6	Yes	Yes	2	2	1	1
Cluster 7	Yes	Yes	4	4	4	4
Cluster 8	Yes	Yes	7	3	3	3
Cluster 10	Yes	Yes	6	5	3	0
Cluster 11	Yes	Yes	3	2	1	1
Cluster 12	Yes	Yes	3	3	2	1
Cluster 13	Yes	Yes	4	3	3	3
Cluster 15(c1)	Yes	Yes	3	0	0	0
Cluster 15(c2)	Yes	Yes	4	1	1	1
Cluster 17	Yes	Yes	4	2	2	1
Cluster 18(c1)	Yes	Yes	3	0	0	0
Cluster 18(c2)	Yes	Yes	2	0	0	0
Cluster 19	Yes	No	3	3	3	3
Big Woods	Yes	No	2	2	2	2
Total	**15**	**17**	**61**	**40**	**34**	**28**

Table 2. List of red-cockaded woodpecker nestlings banded within Piney Grove Preserve during the 2019 breeding season. Genders were determined during fledge checks.

Breeding Group	Date	USGS Band	Left	Right	SEX
Cluster 1	5/13/2019	901-29856	DG/YE/DG	AL/YE	F
Cluster 1	5/13/2019	901-29857	DG/YE/DG	OR/AL	F
Cluster 3	5/13/2019	901-29858	DB/RE/DB	AL/DB	U
Cluster 3	5/13/2019	901-29859	RE/AL	DB/RE/DB	F
Cluster 3	5/13/2019	901-29860	DB/AL	DB/RE/DB	F
Cluster 7	5/13/2019	901-29852	WH/RE/WH	DG/AL	F
Cluster 7	5/13/2019	901-29853	WH/RE/WH	YE/AL	M
Cluster 7	5/13/2019	901-29854	DG/AL	WH/RE/WH	F
Cluster 7	5/13/2019	901-29855	WH/AL	WH/RE/WH	M
Cluster 17	5/13/2019	901-29861	DG/WH/DG	AL/YE	U
Cluster 17	5/13/2019	901-29862	OR/AL	DG/WH/DG	U
Cluster 8	5/16/2019	901-29863	YE/AL	YE/DB/YE	F
Cluster 8	5/16/2019	901-29864	YE/DB/YE	AL/RE	F
Cluster 8	5/16/2019	901-29865	AL/LB	DB/YE/DB	F
Cluster 11	5/16/2019	901-29866	LB/YE/LB	YE/AL	M
Cluster 12	5/16/2019	901-29867	AL/DB	RE/YE/RE	F
Cluster 12	5/16/2019	901-29868	RE/AL	RE/YE/RE	U
Big Woods	5/16/2019	1801-67896	PW/DB/PW	YE/AL	M
Big Woods	5/16/2019	1801-67897	PW/DB/PW	AL/DG	F
Cluster 6	5/21/2019	901-29873	WH/AL	WH/LB/WH	F
Cluster 10	5/21/2019	901-29870	OR/OR/OR	WH/AL	U
Cluster 10	5/21/2019	901-29871	AL/OR	OR/OR/OR	U

Breeding Group	Date	USGS Band	Left	Right	SEX
Cluster 10	5/21/2019	901-29872	AL/LG	OR/WH/OR	U
Cluster 13	5/23/2019	901-29875	YE/OR/YE	DB/AL	M
Cluster 13	5/23/2019	901-29876	OR/YE/OR	LB/AL	M
Cluster 13	5/23/2019	901-29877	YE/OR/YE	HP/AL	F
Cluster 5	5/29/2019	901-29878	LB/WH/LB	YE/AL	M
Cluster 5	5/29/2019	901-29879	WH/LB/WH	AL/RE	F
Cluster 5	5/29/2019	901-29880	AL/YE	LB/WH/LB	F
Cluster 5	5/29/2019	901-29881	YE/AL	WH/LB/WH	F
Cluster 19	5/29/2019	901-29882	YE/WH/YE	DB/AL	M
Cluster 19	5/29/2019	901-29883	AL/YE	YE/WH/YE	F
Cluster 19	5/29/2019	901-29884	YE/WH/YE	AL/RE	F
Cluster 5	6/13/2019	901-29885	OR/DB/OR	AL/OR	F

Breeding Details

Cluster 1 – The breeding male (DG/YE/DG, WH/AL) was present for the eighth consecutive breeding season, though no breeding was recorded in 2014 when all birds present were males. In the 2019 season, a new laying female (AL/OR:LG/DB/LG) was present. Two eggs were detected on 25 April in tree #305. This was a newly constructed cavitiy at about 30 feet tall. We documented two nestlings on 6 May and banded both on 13 May at 6 days of age (physical age; both keyed to 6 days). A fledge check on 5 June identified both birds as female. During the 2019 winter head count, one of these birds was identified in cluster 1 (DG/YE/DG,AL/YE) and the other was identified in cluster 10 (DG/YE/DG,OR/AL).

Cluster 3 – The breeding male (WH/AL, DB/RE/DB) remained for the fourth consecutive year and the breeding female (YE/OR/YE, AL/YE) for the third season. The pair nested in tree #313. Four eggs were discovered on 24 April in a newly constructed cavity at approximately 54 feet high. We recorded 3 two-day old young on May 7 and we banded all three on 13 May between the ages of 7 and 8 on 29 May (physical age; keyed to 8 days for 2 young and 7 days for the third young). A fledge check on 4 June identified all two young as females, but the third could not be located; three subsequent trips to the cluster failed to locate the third young. Only one of these birds (RE/AL,DB/RE/DB)was identified during the 2019 winter count and it was resident in cluster 3.

Cluster 5 – Both breeding adults from the 2017 nesting season were still present in 2018. The represents the fourth consecutive year at cluster 5 for the male (LB/WH/LB, AL/DG) and the third breeding season for the female (OR/WH/OR, AL/LB). The pair nested in cavity tree #260 for the second consecutive year. Breeding activity was first documented on 9 May when 2 eggs were documented. Four young were banded on 4 June between 6 and 7 days (physical age; keyed age 6 days for 3 young and 7 days for fourth young). Three young were identified on 18 June as female and the fourth as a male. Two of these female birds were identified during the 2019 winter survey in cluster 5 (WH/LB/WH,AL/RE and AL/YE,LB/WH/LB) .

Cluster 6 – The breeding adults from the 2017 nesting season did not produce young during 2018, but were still present within the cluster during the 2019 season. This includes male (**(PU)**/YE/**(PU)**, AL/LB) and female (DB/RE/**(DB)**, AL/**(WH)**). Two eggs were observed on 1 May in cavity tree #315; this was a new cavity at approximately 35 feet high. Two nestlings were observed on 14 May, but we banded only 1 nestling on 21 May at 6 days of age (physical age). We determined the lone offspring was a female on a fledge check on 12 June. This bird was not located during the 2019 winter survey.

Clusters 7 & 9 – The breeding male (OR/OR/OR, AL/DG) continued for the eighth consecutive year. The breeding female from 2018 (GY/DB/LB, HP/AL) was absent during the 2019 spring. The breeding female during the 2019 breeding season was (OR/AL, WH/RE/WH). The nest cavity was in tree #297, a newly excavated cavity that is approximately 44 feet high. Four eggs were observed on 25 April and all four eggs hatched on 6 May. Four young were banded on 13 May at 6-7 days (physical age; keyed to 7 days for 3 young and 6 days for 1 young). During a fledge check on 4 June, all birds were identified including two females and two males. Both of the females were still present in cluster 7 during the 2019 winter survey (WH/RE/WH,DG/AL and DG/AL,WH/RE/WH) and one of the males was located in cluster 18 (WH/AL,WH/RE/WH).

Cluster 8 – The breeding female(LB/WH/LB, **(OR)**/AL) returned for the eleventh consecutive year, but the long time breeding male was not recorded on the spring survey. The new breeding male (LG/YE/WH, AL/LB) was originally banded as a nestling in Cluster 8 in 2016. Four eggs were discovered in a newly excavated cavity in tree 320 on 24 April. 6 eggs and one newly hatched nestling were discovered on 7 May and 3 nestlings were banded on 16 May between the age of 6 and 8 days (physical aged, two keyed to eigh and the runt keyed to six). A fledge check on 4 June revealed that all three nestlings fledged, including 2 females and 1 male. Only the male (YE/DB/YE,AL/RE) was located at cluster 8 during the 2019 winter survey.

Cluster 10 – This breeding male (OR/WH/OR, AL/DB) was present for the third consecutive year, but the 2018 female (AL/YE, LG/YE/LG) was replaced by a new female (LB/DB/OR, AL/DG). The nest cavity was in tree #302. Six eggs were observed on 6 May and 5 nestlings were observed on 14 May, but only 3 survived to banding age on 21 May. Two nestlings were day 8 and the third was day 7 (physical age; keyed to 8 days fro 2 nestlings and 7 days for the third). On June 5, we poled the nest cavity and discovered a pile of older (> day 15) dead nestlings in the cavity and no woodpecker activity in the area. We returned to the cluster on multiple occasions and all three adults that had been present throughout the spring and summer were located, but no further evidence of nesting was documented. We do not know what caused the death of the young. While we did remove four flying

squirrels from this cluster prior to the breeding season, no flying squirrels were located at this cluster during autumn cavity checks.

Cluster 11 – The breeding pair including male (YE/DB/YE, LB/AL) and female (OR/DB/OR), AL/DB) were the same for the sixth consecutive year. For the third year the nest cavity was in tree #293. We observed three eggs on 3 May and two young and one egg were observed on 9 May. We banded one day 6 young on 16 May (physical age). During a fledge check on 5 June the young was determined to be a male. The lone male offspring was translocated to Great Dismal Swamp, NWR on 17 October.

Cluster 12 – Both the male (LG/LG/LG, AL/YE) and female (WH/LB/WH, AL/YE) were paired for the third consecutive year and nested in cavity tree #266 for the second consecutive year. We recorded 1 egg on 25 April and 3 eggs on 1 May. We observed 3 nestlings on 9 May and banded two day 6 nestlings (physical age; keyed at 6 for both birds) on 16 May. During a fledge check on 4 June, one old (20+ days) nestling was observed in the cavity. The other young fledged and was identified as a female. This bird was not located during the 2019 winter survey.

Cluster 13 – The breeding male (WH/RE/WH, AL/DB) and female (AL/LG, WH/(PU)/WH) were present for their fourth consecutive breeding season as a pair (and ninth season overall for the male) and used tree 267 for the second consecutive year. Four eggs were observed on 6 May and 3 hatching day nestlings were observed on 16 May. We banded all 3 nestlings on 23 May at 6 days old (physical age; keyed at 6 days for all birds). All of these birds were observed on a June 16 fledge check and 2 were identified as male and third was a female. One of the males (YE/OR/YE, DB/AL) was translocated to the Great Dismal Swamp National Wildlife Refuge and the two other birds were identified in cluster 13 during the 2019 winter survey.

Cluster 15 – Both male (AL/RE, YE/(DB)/(YE)) and female (WH/LB/WH, (PU)/AL) from 2018 were present and nested in a newly constructed cavity in tree #308. This is the third breeding season for the male and the eighth for the female. Three eggs were observed on 6 May but all three were gone on 14 May. The first egg of the pairs second clutch was discovered on 23 May and 4 eggs were observed on 27 May. One day 6 nestling was observed on 4 June and banded the next day at 7 days old (physical age; keyed to 7 days. During a fledge check on 1 July this bird was identified as a female. This bird was not located during the 2019 winter survey.

Cluster 17 – The breeding male from 2018 (AL/LG, WH/LB/WH) was never seen at the cluster, though he was observed foraging near the equipment shed throughout the breeding season. The new breeding male (AL/YE,WH/RE/WH) fledged from cluster 7 during the 2018 breeding season and the breeding female (AL/LG, YE/YE/DB) was the same as in 2018. They nested in a newly excavated cavity in tree #319. Four eggs were observed on 26 April and at 2 hatching day nestlings were observed on 6 May. We banded 2 nestlings at 6 days old (physical age; both keyed to 6 days) on 13 May. The cavity was empty on 3 June but we failed to detect fledglings on three subsequent checks. On subsequent fledge checks, we only detected the two breeding adults foraging. However, one fledgling (DG/WH/DG,AL/YE) was detected during the 2019 winter survey.

Cluster 18 – The male (YE/**(LG)**/(LG), AL/WH) and female (LG/YE/LB, AL/YE) from that were present at this cluster in 2018 nested in a new cavity tree (tree #324) in 2019. We found 3 eggs on 24 April, 2 eggs on 6 May,

and zero eggs on 9 May. We found a second clutch of 2 eggs on 23 May, but that clutch also failed when we found an empty cavity on 3 June. We continued to monitor the cluster throughout the breeding season, but no more nesting activity was observed. Both clutches contained at least one discolored and small egg.

Cluster 19 – Both the breeding male (OR/DB/OR, AL/LG) was present for the fourth consecutive season, but a new female (AL/LB,LG/OR/WH) replaced the 2018 female (DB/DB/WH, AL/LB). The pair nested in the same cavity as in 2018 and 3 eggs were observed on 14 May. Three young were 23 May and banded on 29 may at 5/6 – 7 days old (physical age; one keyed to 5/6 and 2 keyed to 7 days). A fledge check on 18 June identified one as a male and the other 2 as a female. The two female birds were located at cluster 19 and the male was located at cluster 3 during the 2019 winter survey.

Big Woods – A pair of birds bred for the first time within the Big Woods cluster during 2019. The male (AL/OR, YE/OR/YE) was likely the same bird that was observed in Big Woods during the 2018 breeding season and he was joined by a female (DB/DB/WH, AL/LB) that had last bred in cluster 19 during the 2018 breeding season. Matt Kline from DGIF monitored this nest we banded 2 nestlings at 6 days (physical age; both keyed to 6 days) on 16 May. Both of these birds fledged and one was identified as a male and the other identified as a female. Neither of the hatching year birds were observed during the 2019 winter survey.

Population Monitoring

During the calendar year of 2019, 101 individual red-cockaded woodpeckers were identified within Piney Grove Preserve/Big Woods (Tables 2,3,4). This included 72 birds that were hatched at Piney Grove during previous years and 29 nestlings that fledged during the 2019 breeding season. Twelve birds that had been produced during the 2018 breeding season were still present in the population during 2019. Forty-one birds (41%) were in their fourth year (fifth calendar year) or more and ten birds (10%) were at least in their tenth year (eleventh calendar year). One bird was fifteen years old (sixteenth calendar year).

There were 24 birds detected in 2018 that were not detected in 2019. This includes the loss of 13 adults hatched prior to 2018 and 11 birds hatched in 2018. Only seven of the eleven juveniles that left prior to the 2018 breeding season were present during the 2018 winter count. Six of the breeding adults from 2018 were replaced including the females from cluster 1, 7, 10, and 19. The males from clusters 8 and 17 were replaced, though the male from 17 was observed foraging alone near the equipment shed during the 2019 breeding season.

Moving into the breeding season there were 65 birds identified within Piney Grove Preserve distributed among 14 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 and Big Woods. This tied 2018 as the highest number of adults that Piney Grove has ever carried into the breeding. The number of birds per cluster varied from two to seven with a mean of 4.33 ±0.45 (mean±SE). Cluster 15 and the Big Woods had only the breeding pair present moving into the breeding season, though both clusters were joined by a helper during the breeding season. Clusters 8, 5 and 7 carried the most birds, all of which included 7 individuals.

Seventy-seven birds were detected during the 2019 winter survey (Table 4). This represents a 5% increase over the 2018 winter survey and a 13% increase over the 2017 winter survey (77 vs 73 vs 68). Birds present include 15 of the 29 birds fledged in 2019 and 62 adult birds hatched in previous years. There were 10 adult birds detected during the spring survey that were not detected during winter survey.

During the winter survey, birds were associated with 15 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 and Big Woods. As in years past, the birds roosting in C-9 actively forage with the birds from C-7 so behave as one functional group. Group size in winter ranged from two to nine birds and averaged 5.13±0.56 (mean ± SE) birds per group. Cluster five supported nine birds and cluster seven supported eight birds.

Table 3. Individual red-cockaded woodpecker sightings during the 2019 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
821-70970	AL/DB	**(LG)**/YE/**(LG)**	M	2013	1
2421-02944	LB/WH/OR	AL/DG	F	2016	1
1581-66270	DG/YE/DG	WH/AL	M	2006	1
2421-02916	AL/OR	LG/DB/LG	F	2015	1
2421-01604	DG/YE/DG	DB/AL	M	2018	1
901-29851	OR/DG/OR	AL/LB	M	2015	3
2421-02910	WH/AL **(rev)**	**(DB)**/RE/DB	M	2014	3
821-70952	YE/**(OR)**/YE	AL/YE	F	2012	3
2421-02949	LB/YE/DG	AL/LG	M	2016	5
2421-01603	AL/OR	LB/WH/LB	F	2018	5
821-70983	AL/WH	WH**/(LB)**/WH	F	2013	5
1581-66288	LB/WH/LB	AL/DG	M	2008	5
2421-02903	WH/OR/OR	AL/LB	F	2014	5
2421-01602	AL/LG	LB/WH/LB	M	2018	5
2421-02978	LG/DB/YE	HP/AL	F	2017	5

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Spring Cluster
821-70970	AL/DB	**(LG)**/YE/**(LG)**	M	2013	1
1581-66297	AL/**(RE)**	LG/YE/DG	F	2009	6
1581-66253	DB/RE/**(DB)**	AL/**(WH)**	F	2004	6
821-70946	**(PU)**/YE/**(PU)**	AL/LB	M	2012	6
2421-02948	DB/WH/YE	AL/DB	F	2016	6
2421-02975	WH/DB/YE	PK/AL	M	2017	6
2421-02943	DB/LG/YE	AL/DB	M	2016	7
2421-02914	AL/**(DB)**	WH/**(PU)**/WH	M	2015	7
821-70901	OR/OR/OR	AL/DG	M	2009	7
2421-02982	OR/AL**(rev)**	WH/RE/WH	F	2018	7
821-70972	WH/**(PU)**/WH	AL/OR	M	2013	7
2421-01605	Al/DB	OR/OR/OR	U	2018	7
821-70967	AL/OR	YE/YE/DB	M	2013	8
2421-02942	LG/YE/WH	AL/LB	M	2016	8
1581-66278	LB/WH/LB	**(OR)**/AL	F	2007	8
2421-02965	YE/WH/BK	PK/AL	M	2017	8
2421-02927	YE/**(YE)/(DB)**	AL/WH	M	2015	8
821-70918	**(YE)**/DB/**(YE)**	**(YE)**/AL	M	2011	8
2421-02977	OR/DB/LB	HP/AL	F	2017	8
Unbanded	Unbanded	Unbanded	U	Unknown	10
2421-02941	LB/DB/OR	AL/DG	F	2016	10
2421-02929	OR/WH/OR	AL/DB	M	2015	10
2421-02970	LG/DB/LB	HP/AL	M	2017	11

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Spring Cluster
821-70970	AL/DB	**(LG)**/YE/**(LG)**	M	2013	1
821-70935	OR/DB/OR	AL/DB	F	2011	11
821-70919	YE/DB/YE	LB/AL	M	2011	11
2421-02981	LB/DB/OR	HP/AL	F	2017	11
821-70988	WH/LB/WH	AL/YE	F	2014	12
2421-02931	LG/LG/LG	AL/YE	M	2015	12
821-70989	LG/LG/LG	AL/LG	M	2014	12
2421-02995	YE/RE/YE	AL/DB	M	2018	12
2421-02907	AL/WH	YE/OR/YE	M	2014	13
2421-02951	DB/DB/DB	AL/OR	F	2016	13
2421-02905	AL/LG	WH/**(PU)**/WH	F	2014	13
1581-66274	WH/RE/WH	AL/DB	M	2007	13
2421-02964	WH/DB/OR	**(HP)**/AL	M	2017	13
2421-02991	YE/**(WH)**/YE	AL/LB	F	2018	13
821-70929	OR/YE/YE**(rev)**	AL/WH	M	2011	13,7
821-70906	AL/RE	YE/**(DB)**/**(YE)**	M	2010	15
821-70933	LB/WH/WH	**(PU)**/AL	F	2011	15
821-70965	AL/LG	YE/YE/DB	F	2013	17
2421-02987	DG/WH/DG	AL/OR	F	2018	17
821-70949	AL/LG	WH/LB/WH	M	2012	17
2421-02933	WH/LB/WH	AL/LB	M	2015	17
821-70923	YE**/(LG)**/**(LG)**	AL/WH	M	2011	18
2421-02952	LG/YE/LB	AL/YE	F	2016	18

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Spring Cluster
821-70970	AL/DB	**(LG)**/YE/**(LG)**	M	2013	1
Unbanded	Unbanded	Unbanded	U	Unknown	18
2421-02945	AL/LB	LG/OR/WH	F	2016	19
2421-02969	LB/DB/GY	HP/AL	M	2017	19
821-70936	OR/DB/OR	AL/LG	M	2011	19
2421-02939	DB/DB/WH	AL/LB	F	2016	BW[a]
2421-02906	AL/OR	YE/OR/YE	M	2014	BW[a]

[a]Big Woods

Table 4. Individual red-cockaded woodpecker sightings during the 2019-2020 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
2421-01604	DG/YE/DG	DB/AL	M	2018	1
821-70970	AL/DB	**(LG)**/YE/**(LG)**	M	2013	1
2421-02944	LB/WH/OR	AL/DG	F	2016	1
2421-02916	AL/OR	LG/DB/LG	F	2015	1
1581-66270	DG/YE/DG	WH/AL	M	2006	1
901-29856	DG/YE/DG	AL/YE	F	2019	1
901-29851	OR/DG/OR	AL/LB	M	2015	3
2421-02910	WH/AL **(rev)**	DB/RE/DB	M	2014	3
821-70952	YE/**(OR)**/**(YE)**	AL/YE	F	2012	3
2421-02966	BK/OR/DB	HP/AL	M	2017	3
901-29882	YE/WH/YE	DB/AL	M	2019	3
901-29859	RE/AL	DB/RE/DB	F?	2019	3
2421-02977	OR/DB/LB	HP/AL	F	2017	3
2421-02999	DB/RE/DB	AL/YE	F	2018	5
2421-01603	AL/OR	LB/WH/LB	F	2018	5
2421-01602	AL/LG	LB/WH/LB	M	2018	5
2421-02949	LB/YE/**(DG)**	AL/LG	M	2016	5
821-70983	AL/WH	WH**/(LB)**/WH	F	2013	5
1581-66288	LB/WH/LB	AL/DG	M	2008	5
2421-02903	WH/OR/OR	AL/LB	F	2014	5
901-29879	WH/LB/WH	AL/RE	F	2019	5

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Winter Cluster
901-29880	AL/YE	LB/WH/LB	F	2019	5
1581-66253	DB/RE/**(DB)**	AL/**(WH)**	F	2004	6
821-70946	**(PU)**/YE/**(PU)**	AL/LB	M	2012	6
1581-66297	AL/**(RE)**	LG/YE/DG	F	2009	6
2421-02948	DB/WH/YE	AL/DB	F	2016	6
2421-02975	WH/DB/YE	PK/AL	M	2017	6
2421-02982	OR/AL**(rev)**	WH/RE/WH	F	2018	7
2421-02943	DB/LG/YE	AL/DB	M	2016	7
2421-02914	AL/**(DB)**	WH/**(PU)**/WH	M	2015	7
821-70901	OR/OR/OR	AL/DG	M	2009	7
	OR/YE/YE(rev)	AL/LG	F	2012	7
2421-02969	LB/DB/GY	HP/AL	M	2017	7
901-29852	WH/RE/WH	DG/AL	F	2019	7
901-29854	DG/AL	WH/RE/WH	F	2019	7
2421-02985	AL/LB	WH/RE/WH	M	2018	8
821-70967	AL/OR	YE/YE/DB	M	2013	8
2421-02942	LG/YE/WH	AL/LB	M	2016	8
1581-66278	LB/WH/LB	**(OR)**/AL	F	2007	8
901-29864	YE/DB/YE	AL/RE	M	2019	8
2421-02965	YE/(**WH)**/BK*	PK/AL	M	2017	8
821-70918	**(YE)**/**(DB)**/**(YE)**	**(YE)**/AL	M	2011	8
2421-02941	LB/DB/OR	AL/DG	F	2016	10
2421-02929	OR/WH/OR	AL/DB	M	2015	10

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Winter Cluster
Unbanded	Unbanded	Unbanded	U	Unknown	10
901-29857	DG/YE/DG	OR/AL	F	2019	10
2421-02981	LB/DB/OR	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
2421-02996	YE/RE/YE	AL/YE	F	2018	12
821-70988	WH/LB/WH	AL/YE (2)	F	2014	12
2421-02931	LG/LG/LG	AL/YE	M	2015	12
2421-02990	YE/OR/YE	AL/OR	M	2018	12,13
2421-02907	AL/WH	YE/OR/YE	M	2014	13
2421-02951	DB/DB/DB	AL/OR	F	2016	13
2421-02905	AL/LG	WH/**(PU)**/WH	F	2014	13
1581-66274	WH/RE/WH	AL/DB_faded	M	2007	13
901-29875	YE/OR/YE	DB/AL	M	2019	13
901-29877	YE/OR/YE	HP/AL	F	2019	13
2421-02964	WH/DB/OR	(HP)/AL	M	2017	13
821-70906	AL/RE	YE/**(DB)**/**(YE)**	M	2010	15
821-70933	LB/WH/WH	**(PU)**/AL	F	2011	15
2421-02984	AL/YE	WH/RE/WH	M	2018	17
821-70965	AL/LG	YE/YE/DB	F	2013	17
901-29861	DG/WH/DG	AL/YE	U	2019	17
821-70923	YE**/(LG)**/**(LG)**	AL/WH	M	2011	18
2421-02952	LG/YE/LB	AL/YE	F	2016	18

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Winter Cluster
901-29855	WH/AL	WH/RE/WH	M	2019	18
2421-02970	LG/DB/LB	HP/AL	M	2017	19
2421-01605	Al/DB	OR/OR/OR	F	2018	19
821-70936	OR/DB/OR	AL/LG	M	2011	19
2421-02945	AL/LB	LG/OR/WH	F	2016	19
901-29883	AL/YE	YE/WH/YE	F	2019	19
901-29884	YE/WH/YE	AL/RE	F	2019	19
2421-02987	DG/WH/DG	AL/OR	F	2018	BW1
2421-02939	DB/DB/WH	AL/LB	F	2016	BW1
2421-02906	AL/OR	YE/OR/YE	M	2014	BW1,12

[a]Big Woods

Translocation

Single male and female hatching-year birds were captured in Piney Grove Preserve on 17 October, 2019 and taken to Great Dismal Swamp, NWR for release. The birds were transported in holding boxes, placed in artificial cavities and screened in for the night. Both birds were released just after dawn on 18 October by removing the cavity screens. Both birds emerged successfully from cavities and foraged in the surrounding canopy.

Table 5. Summary of translocation activities for red-cockaded woodpeckers from Piney Grove Preserve during 2019.

USGS Band	Left Leg	Right Leg	Sex	Date Moved	Origin	Destination
901-29866	LB/YE/LB	YE/AL	M	11/8/18	PGP-C11	GDSNWR-S2-3
901-29875	YE/OR/YE	DB/AL	M	11/8/18	PGP-C13	GDSNWR-S2-2

Tree and Cavities

A total of 270 woodpecker cavities trees supporting 326 cavities were known and still standing during 2019 (Appendix I). This total includes 242 natural cavities and 84 artificial inserts. Of the 242 natural cavities 93 (38.4%) were starts in various stages of completion. Of the 150 completed natural cavities, 73 (48.7%) were considered active in December.

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APPENDICES

Appendix I. Status of Red-cockaded Woodpecker Cavity Trees at the Piney Grove Preserve in 2018.

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
1	32		Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Recent
1	34		Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	35		Unavailable	Dead	Natural	NA	Unavailable	Unavailable	Unavailable	Unavailable
1	36		Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
1	37		Loblolly	Live	Natural	Inactive	Start	<2x	Unstarted	Old/None
1	43		Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
1	44	a	Loblolly	Live	Natural	Inactive	Complete	>2x	Unstarted	Old/None
1	44	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
1	46	a	Loblolly	Live	Natural	Unknown	Complete	>2x	Unstarted	Old/None
1	48		Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	49		Loblolly	Live	Natural	Inactive	Unavailable	Normal	Unstarted	Old/None
1	52		Loblolly	Live	Artificial	Inactive	Insert	Restrictor	Unstarted	Old/None
1	54	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	54	b	Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Old/None
1	55	a	Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	55	b	Loblolly	Live	Natural	Relic	Complete	>2x	Unavailable	Old/None
1	55	c	Loblolly	Live	Natural	Relic	Complete	>2x	Unavailable	Old/None
1	57		Loblolly	Live	Natural	Active	Complete	>2x	Complete	Recent
1	58	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Fresh
1	58	b	Loblolly	Live	Natural	Unknown	Complete	Restrictor	Complete	Fresh

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
1	58	c	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Fresh
1	59	a	Loblolly	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Old/None
1	59	b	Loblolly	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Old/None
1	117	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
1	117	b	Loblolly	Live	Natural	Active	Insert	Normal	Unstarted	Fresh
1	212		Shortleaf	Live	Natural	Active	Complete	<2x	Complete	Fresh
1	213		Loblolly	Live	Natural	Inactive	Complete	>4x	Unavailable	Old/None
1	225		Shortleaf	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
1	241		Loblolly	Live	Natural	Inactive	Complete	>2x	Incomplete	Recent
1	242		Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Unstarted	Old/None
1	257	a	Loblolly	Live	Natural	Inactive	Complete	>2x	Incomplete	Fresh
1	257	b	Loblolly	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Old/None
1	273		Shortleaf	Live	Natural	Active	Complete	>2x	Complete	Fresh
1	304		Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Unstarted	Fresh
1	305		Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
1	307		Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Incomplete	Recent
1	1NT6		Shortleaf	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Old/None
1	1NT8			Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
1	Unknown		Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Old/None
2	60		Loblolly	Live	Artificial	Relic	Insert	Unavailable	Unstarted	Old/None
2	63		Loblolly	Live	Artificial	Relic	Insert	Unavailable	Unstarted	Old/None
3	2		Loblolly	Live	Artificial	Inactive	Insert	Restrictor	Complete	Old/None
3	6		Loblolly	Live	Natural	Relic	Start (Adv)	Normal	Unstarted	Old/None
3	7		Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
3	8		Loblolly	Live	Natural	Unknown	Complete	>2x	Complete	Old/None
3	9		Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Old/None
3	72		Loblolly	Live	Natural	Relic	Complete	Healing	Unstarted	Old/None
3	75		Loblolly	Live	Natural	Relic	Unavailable	Healing	Unavailable	Old/None
3	79		Loblolly	Live	Artificial	Inactive	Insert	Healing	Unstarted	Old/None
3	80	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Recent
3	128		Loblolly	Live	Natural	Active	Complete	>2x	Incomplete	Fresh
3	177		Loblolly	Live	Natural	Inactive	Unavailable	Unavailable	Unavailable	Old/None
3	178		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
3	179		Loblolly	Live	Natural	Active	Complete	<2x	Complete	Fresh
3	208		Loblolly	Live	Natural	Relic	Complete	Normal	Unavailable	Old/None
3	258		Loblolly	Live	Natural	Unknown	Complete	>2x	Complete	Fresh
3	259		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
3	289		Loblolly	Live	Natural	Relic	Start (Adv)	<2x	Unstarted	Old/None
3	313		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
3	3NT2		Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
3	3NT3		Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
3	3NT4		Loblolly	Live	Natural	Active	Start (Adv)	Normal	Unstarted	Fresh
4	82	b	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
4	84		Loblolly	Live	Artificial	Inactive	Insert	<2x	Unstarted	Old/None
4	186	b	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
5	14		Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Old/None
5	15		Loblolly	Live	Natural	Unknown	Complete	>2x	Complete	Recent
5	17		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
5	18	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
5	18	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
5	19	a	Loblolly	Live	Natural	Inactive	Unavailable	Normal	Unstarted	Old/None
5	19	b	Loblolly	Live	Natural	Inactive	Unavailable	Normal	Unstarted	Old/None
5	19	c	Loblolly	Live	Natural	Inactive	Unavailable	Normal	Unstarted	Old/None
5	22		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
5	24	a	Loblolly	Live	Natural	Inactive	Complete	Restrictor	Complete	Old/None
5	24	b	Loblolly	Live	Natural	Inactive	Complete	Restrictor	Complete	Old/None
5	24	c	Loblolly	Live	Natural	Inactive	Complete	Restrictor	Complete	Old/None
5	25		Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Old/None
5	26		Loblolly	Live	Natural	Inactive	Complete	Restrictor	Complete	Old/None
5	28		Loblolly	Live	Natural	Relic	Complete	Restrictor	Unavailable	Old/None
5	30		Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
5	92		Loblolly	Live	Natural	Inactive	Start	Healing	Unstarted	Old/None
5	94		Loblolly	Live	Artificial	Relic	Insert	Restrictor	Complete	Old/None
5	95		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
5	127		Loblolly	Live	Natural	Inactive	Unavailable	Unavailable	Unstarted	Old/None
5	191		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
5	217		Loblolly	Live	Natural	Inactive	Complete	Normal	Incomplete	Old/None
5	218		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
5	236		Loblolly	Live	Natural	Active	Complete	<2x	Incomplete	Fresh
5	237		Loblolly	Live	Natural	Inactive	Complete	Normal	Unstarted	Recent
5	248		Loblolly	Live	Natural	Inactive	Complete	Normal	Incomplete	Old/None
5	260		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
5	261		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
5	262		Loblolly	Live	Natural	Active	Complete	<2x	Incomplete	Recent
5	290	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
5	290	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unavailable	Fresh
5	323		Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
5	5NT1		Loblolly	Live	Natural	Inactive	Unavailable	Unavailable	Unstarted	Old/None
5	5nt11		Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
5	5NT13		Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Incomplete	Old/None
6	137		Loblolly	Live	Artificial	Active	Insert	Normal	Unavailable	Fresh
6	234	A	Loblolly	Live	Natural	Unknown	Start	Normal	Unstarted	Old/None
6	234	B	Loblolly	Live	Natural	Unknown	Start	Normal	Unstarted	Old/None
6	234	C	Loblolly	Live	Natural	Unknown	Start	Normal	Unstarted	Old/None
6	234	D	Loblolly	Live	Natural	Unknown	Start	Normal	Unstarted	Old/None
6	234	E	Loblolly	Live	Natural	Unknown	Start	Normal	Unstarted	Old/None
6	234	F	Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Unstarted	Old/None
6	234	G	Loblolly	Live	Natural	Unknown	Start	Normal	Unstarted	Old/None
6	315		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
6	318		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
6	116		Loblolly	Live	Artificial	Active	Insert	Restrictor	Complete	Fresh
6	135	a	Loblolly	Live	Natural	Inactive	Start (Adv)	>4x	Unavailable	Old/None
6	135	b	Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Unavailable	Old/None
6	135	c	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Old/None
6	136	a	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Complete	Old/None
6	136	b	Loblolly	Live	Natural	Inactive	Start	Normal	Complete	Old/None

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
6	136	c	Loblolly	Live	Natural	Inactive	Start	<2x	Complete	Old/None
6	137		Loblolly	Live	Artificial	Active	Insert	Normal	Complete	Fresh
6	139	A	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
6	139	B	Loblolly	Live	Natural	Active	Start	Normal	Complete	Recent
6	166		Loblolly	Live	Artificial	Unknown	Insert	Normal	Incomplete	Old/None
6	199		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Fresh
6	200		Loblolly	Live	Artificial	Inactive	Insert	>2x	Incomplete	Old/None
6	206		Loblolly	Live	Natural	Inactive	Start (Adv)	>4x	Incomplete	Old/None
6	233		Loblolly	Live	Natural	Unknown	Complete	Restrictor	Unavailable	Recent
6	235		Loblolly	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Recent
6	256	a	Loblolly	Live	Natural	Active	Start	Normal	Complete	Recent
6	256	b	Loblolly	Live	Natural	Active	Complete	Restrictor	Complete	Recent
6	268		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Recent
6	33	A	Loblolly	Live	Natural	Inactive	Start	>2x	Unstarted	Old/None
6	33	B	Loblolly	Live	Natural	Inactive	Start	>2x	Unstarted	Old/None
6	33	C	Loblolly	Live	Natural	Inactive	Start	>2x	Unstarted	Old/None
7	105		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Old/None
7	243		Loblolly	Live	Natural	Inactive	Complete	Normal	Complete	Old/None
7	253		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
7	275		Loblolly	Live	Natural	Active	Start (Adv)	Normal	Complete	Old/None
7	277		Loblolly	Live	Natural	Inactive	Complete	Normal	Incomplete	Fresh
7	284		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
7	297		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
7	299		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
7	300		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
7	106	a	Loblolly	Live	Natural	Relic	Complete	>4x	Complete	Old/None
7	106	b	Loblolly	Live	Natural	Relic	Start	Normal	Complete	Old/None
7	106	c	Loblolly	Live	Natural	Inactive	Start	Normal	Complete	Old/None
7	107	a	Unavailable	Dead	Natural	Relic	Unavailable	Unavailable	Unavailable	Unavailable
7	107	b	Unavailable	Dead	Natural	Relic	Unavailable	Unavailable	Unavailable	Unavailable
7	108		Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Old/None
7	109	A	Loblolly	Live	Natural	Active	Complete	>2x	Complete	Fresh
7	109	B	Loblolly	Live	Natural	Active	Start (Adv)	Normal	Unstarted	Fresh
7	110		Loblolly	Dead	Artificial	Unknown	Insert	Normal	Incomplete	Old/None
7	111		Unavailable	Dead	Artificial	Relic	Insert	Restrictor	Unavailable	Unavailable
7	195		Loblolly	Live	Artificial	Inactive	Insert	<2x	Unstarted	Old/None
7	216		Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
7	272		Loblolly	Live	Natural	Inactive	Complete	>2x	Incomplete	Old/None
7	276		Loblolly	Live	Natural	Unknown	Complete	>2x	Unstarted	Recent
7	7NT1		Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
7	7NT3		Loblolly	Live	Natural	Unknown	Start	Normal	Unstarted	Fresh
8	129		Loblolly	Live	Natural	Inactive	Complete	<2x	Unavailable	Fresh
8	170		Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
8	171		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Old/None
8	173		Loblolly	Live	Natural	Inactive	Complete	Normal	Unstarted	Old/None
8	175		Loblolly	Live	Natural	Inactive	Complete	>2x	Incomplete	Old/None
8	176	A	Loblolly	Live	Natural	Inactive	Complete	>2x	Incomplete	Old/None
8	176	B	Loblolly	Live	Natural	Inactive	Complete	>2x	Incomplete	Old/None

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
8	209	a	Loblolly	Live	Natural	Relic	Complete	>2x	Complete	Old/None
8	209	b	Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Complete	Old/None
8	210		Loblolly	Live	Natural	Inactive	Complete	>4x	Unavailable	Old/None
8	211		Loblolly	Live	Artificial	Unknown	Insert	<2x	Unavailable	Old/None
8	219		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
8	220		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
8	226		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
8	227		Loblolly	Live	Artificial	Inactive	Insert	Healing	Unstarted	Old/None
8	228		Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
8	229		Loblolly	Live	Natural	Relic	Start (Adv)	<2x	Unstarted	Old/None
8	230		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
8	231		Loblolly	Live	Natural	Unknown	Complete	Normal	Complete	Fresh
8	263		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
8	286		Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Unstarted	Old/None
8	287		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
8	288		Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Incomplete	Recent
8	301		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
8	320		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Recent
8	321		Loblolly	Live	Natural	Active	Complete	>2x	Complete	Fresh
8	809		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Recent
8	8NT1		Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Unstarted	Recent
8	8NT1		Loblolly	Live	Natural	Unknown	Start (Adv)	<2x	Unstarted	Old/None
8	8NT2		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
9	85		Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
9	86		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
9	87		Loblolly	Live	Artificial	Active	Insert	Normal	Complete	Fresh
9	88		Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
10	64		Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
10	65		Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
10	66		Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
10	68		Loblolly	Live	Natural	Inactive	Start	<2x	Unstarted	Old/None
10	150		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Old/None
10	156		Loblolly	Live	Natural	Unknown	Complete	Restrictor	Complete	Old/None
10	157		Loblolly	Live	Natural	Inactive	Complete	Restrictor	Complete	Old/None
10	214		Loblolly	Live	Natural	Active	Complete	Restrictor	Complete	Fresh
10	215		Unavailable	Dead	Natural	NA	Unavailable	Unavailable	Complete	Old/None
10	247		Loblolly	Live	Natural	Unknown	Complete	Restrictor	Complete	Old/None
10	274		Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Old/None
10	301		Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
10	302		Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
10	303		Shortleaf	Live	Natural	Active	Complete	>2x	Incomplete	Fresh
10	10-nt2019-2		Loblolly	Live	Natural	Unknown	Start	Normal	Unavailable	Old/None
10	10nt3	a	Loblolly	Live	Natural	Inactive	Start (Adv)	<2x	Unstarted	Old/None
10	10nt3	b	Loblolly	Live	Natural	Inactive	Start	<2x	Unstarted	Old/None
10	10nt3	c	Loblolly	Live	Natural	Inactive	Start	<2x	Unstarted	Old/None
10	10nt4	a	Loblolly	Live	Natural	Inactive	Complete	<2x	Unstarted	Old/None
10	10nt4	b	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
10	10nt6		Shortleaf	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
10	10NT7		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
11	140		Loblolly	Live	Artificial	Relic	Insert	<2x	Complete	Old/None
11	141		Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
11	142		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Old/None
11	143		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Old/None
11	238		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
11	239		Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Old/None
11	240		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
11	269		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
11	270		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
11	285		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
11	291		Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
11	292		Loblolly	Live	Natural	Unknown	Start (Adv)	Normal	Unstarted	Recent
11	293		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
11	294		Loblolly	Live	Natural	Unknown	Complete	>2x	Unstarted	Recent
11	11NT1		Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
12	266		Shortleaf	Live	Natural	Inactive	Complete	<2x	Complete	Recent
12	267			Live	Natural	Active	Complete	Normal	Incomplete	Recent
12	296	a	Loblolly	Live	Natural	Inactive	Start (Adv)	>2x	Unstarted	Old/None
12	296	b	Loblolly	Live	Natural	Inactive	Start	>2x	Unstarted	Old/None
12	296	c	Loblolly	Live	Natural	Inactive	Start	>2x	Unstarted	Old/None
12	296	d	Loblolly	Live	Natural	Unknown	Start	Normal	Unstarted	Old/None
12	316		Loblolly	Live	Natural	Active	Start (Adv)	Normal	Unstarted	Old/None
12	12NT1		Shortleaf	Live	Natural	Active	Complete	Normal	Incomplete	Fresh

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
12	131		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Fresh
12	132		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
12	133		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
12	158		Shortleaf	Dead	Artificial	Relic	Insert	Restrictor	Unavailable	Old/None
12	159		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
12	189		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
12	244	a	Loblolly	Live	Natural	Inactive	Complete	>2x	unstarted	Recent
12	244	b	Loblolly	Live	Natural	Inactive	Complete	>2x	unstarted	Recent
12	244	c	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Recent
12	244	d	Loblolly	Live	Natural	Active	Complete	Normal	Unavailable	Recent
12	244	e	Loblolly	Live	Natural	Unknown	Start	Normal	Unstarted	Recent
12	295		Loblolly	Live	Natural	Active	Complete	<2x	Incomplete	Recent
13	119		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Recent
13	120		Loblolly	Live	Artificial	Active	Insert	Normal	Unavailable	Fresh
13	121		Loblolly	Live	Artificial	Active	Insert	Normal	Complete	Fresh
13	122		Loblolly	Live	Artificial	Inactive	Insert	>2x	Unavailable	Old/None
13	123		Loblolly	Live	Artificial	Inactive	Insert	<2x	unstarted	Old/None
13	124		Loblolly	Live	Artificial	Inactive	Insert	<2x	Complete	Old/None
13	144		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
13	145		Loblolly	Live	Natural	Inactive	Start (Adv)	>2x	Unstarted	Recent
13	168		Loblolly	Live	Artificial	Active	Insert	Normal	Unavailable	Recent
13	169		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Recent
13	271		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
13	311		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
13	312		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
13	13NT3		Loblolly	Live	Natural	Active	Start (Adv)	Normal	Incomplete	Fresh
14	88		Loblolly	Live	Natural	Relic	Start	<2x	Unstarted	Old/None
14	89		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
14	91		Loblolly	Live	Artificial	Relic	Insert	Healing	Unavailable	Old/None
14	100		Loblolly	Live	Natural	Inactive	Start (Adv)	>2x	Unstarted	Old/None
14	101		Loblolly	Live	Natural	Inactive	Complete	Healing	Unavailable	Old/None
15	160		Loblolly	Live	Artificial	Inactive	Insert	<2x	Unavailable	Old/None
15	161	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
15	161	b		Live	Artificial	Inactive	Insert	Normal	Complete	Recent
15	162		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Old/None
15	163		Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
15	187		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Old/None
15	198		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
15	205	a		Live	Natural	Unknown	Start	Normal	Unstarted	Recent
15	205	b		Live	Natural	Unknown	Start (Adv)	Normal	Unstarted	Recent
15	205	c		Live	Natural	Unknown	Start	Normal	Unstarted	Recent
15	205		Loblolly	Live	Natural	Inactive	Complete	>4x	Complete	Recent
15	221		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
15	264		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
15	265	a	Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh
15	265	b	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Fresh
15	265	c		Live	Natural	Unknown	Start	Normal	Unstarted	Fresh
15	308		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Fresh

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
15	15NT1		Loblolly	Live	Natural	Inactive	Start (Adv)	Normal	Unstarted	Old/None
15	15NT4		Loblolly	Live	Natural	Inactive	Start	<2x	Unavailable	Old/None
15	15NT5		Loblolly	Live	Natural	Active	Start (Adv)	<2x	Unstarted	Fresh
16	167		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
16	16NT1		Loblolly	Live	Natural	Inactive	Start (Adv)	>2x	Unstarted	Old/None
16	16NT2	a	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
16	16NT2	b	Loblolly	Live	Natural	Inactive	Complete	>2x	Unavailable	Old/None
17	146		Loblolly	Live	Artificial	Inactive	Insert	Normal	Incomplete	Old/None
17	147		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
17	249		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
17	250		Loblolly	Live	Artificial	Unknown	Insert	Normal	Unstarted	Old/None
17	251		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
17	252		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
17	283		Loblolly	Live	Natural	Active	Complete	>2x	Incomplete	Fresh
17	319		Loblolly	Live	Natural	Active	Complete	>2x	Incomplete	Fresh
17	17NT1		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
18	181		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Recent
18	182		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
18	183		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
18	184	a	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
18	207		Shortleaf	Live	Natural	Inactive	Complete	>4x	Complete	Old/None
18	254	a	Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Recent
18	254	b	Loblolly	Live	Natural	Inactive	Complete	>2x	Complete	Recent
18	278		Loblolly	Live	Artificial	Active	Insert	Normal	Incomplete	Fresh

Cluster	Tree	Cavity	Species	Condition	Cavity	Status	Condition	Entrance	Plate	Resin Work
18	279		Loblolly	Live	Artificial	Unknown	Insert	Normal	Unavailable	Recent
18	280		Loblolly	Live	Artificial	Active	Insert	Normal	Incomplete	Fresh
18	281		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Old/None
18	324		Shortleaf	Live	Natural	Active	Complete	Normal	Complete	Fresh
18	18NT1		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
19	322		Loblolly	Live	Natural	Active	Complete	Normal	Incomplete	Fresh
19	134		Loblolly	Live	Artificial	Active	Insert	Normal	Incomplete	Fresh
19	148		Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
19	149		Loblolly	Live	Artificial	Inactive	Insert	Normal	Incomplete	Old/None
19	19NT1		Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Recent
19	201		Loblolly	Live	Artificial	Inactive	Insert	Normal	Complete	Old/None
19	203		Loblolly	Live	Artificial	Active	Insert	Normal	Complete	Old/None
19	223	a	Loblolly	Live	Natural	Active	Complete	>2x	Complete	Recent
19	223	b	Loblolly	Live	Natural	Unknown	Start (Adv)	>2x	Unstarted	Old/None
19	224		Unavailable	Dead	Natural	Inactive	Complete	>4x	Complete	Old/None
19	232		Loblolly	Live	Natural	Active	Complete	Normal	Complete	Recent
19	245	a	Loblolly	Live	Natural	Unknown	Start (Adv)	>2x	Unstarted	Recent
19	245	b	Loblolly	Live	Natural	Unknown	Start	>2x	Unstarted	Old/None