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Investigation of red-cockaded woodpeckers in Virginia: 2017 report

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INVESTIGATION OF RED-COCKADED WOODPECKERS IN VIRGINIA: 2017 REPORT

THE CENTER FOR CONSERVATION BIOLOGY

COLLEGE OF WILLIAM AND MARY

VIRGINIA COMMONWEALTH UNIVERSITY

Investigation of Red-cockaded Woodpeckers in Virginia: 2017 report

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Front Cover Image: Red-cockaded Woodpeckers on cavity tree. Image by Megan Massa.

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 2017 breeding season, Piney Grove Preserve supported 13 potential breeding groups that produced 25 fledglings. All groups made breeding attempts except for cluster 17. Only one of the remaining 12 clusters failed to produce fledglings. A viable pair was not present and no breeding attempt was made in cluster 18 for the first time since 2013. The population as a whole had a reproductive rate of 2.1±0.29 (mean±SE). The 12 groups that made breeding attempts had a success rate of 92% (11 of 12). Fledging rate for the11 productive pairs was 2.3±0.24. Of the 39 eggs followed in 2017, 21 (53.8%) hatched, 21 (53.8%) survived to banding age, and 21 (53.8%) fledged. Birds that fledged included 16 females and 9 males. Fourteen of these birds were retained and detected during the winter count and two (male and female, hatching-year birds) were translocated to Great Dismal Swamp, NWR on 20 October.

During the calendar year of 2017, 84 individual red-cockaded woodpeckers were identified within Piney Grove preserve. This included 59 birds that were hatched at Piney Grove during previous years and 25 nestlings that fledged during the 2017 breeding season. Forty birds (47%) were in their fourth year or more and seven birds (8.3%) were at least in their tenth year. Two birds were thirteen years old.

Moving into the breeding season there were 53 birds identified within Piney Grove Preserve distributed among 14 clusters. This was the lowest number of adults that Piney Grove has carried into the breeding season since 2013. The number of birds per cluster varied from one to eight with a mean of 3.8±0.46 (mean±SE). Sixty-nine birds were detected during the 2017 winter survey. This represents a 26% increase (69 vs 54) from the winter of 2016. Birds present include 14 of the 25 birds fledged in 2017 and 55 adult birds hatched in previous years. Group size in winter ranged from three to nine birds and averaged 4.9±0.47 (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 in 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 and 2017 with the intent of establishing a second breeding population within the state. The first successful breeding in the refuge was documented during the spring of 2017.

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 2017 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. 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 the 2000 season, 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.

It should be noted that color bands applied since 2009 have had unacceptably high loss rates. Prior to 2009 the project used typical celluloid bands that had low rates of loss. When these bands were no longer available on the market the project began to utilize darvic bands (2009) and then acetal bands (2012) provided by Avinet. Both band types had high loss rates in Virginia and within many other locations (personal communication). In 2016 the project transitioned to using bands made by RedBird. We have initiated a capture program to replace defective bands and this effort is ongoing.

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 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 13 potential breeding groups in 2017 that produced 25 fledglings (Table 1). All potential breeding groups made breeding attempts except for cluster 17. A viable pair was not present and no breeding attempt was made in cluster 18 for the first time since 2013. Of the remaining breeding groups, only cluster 10 failed to produce fledglings. The population as a whole had a reproductive rate of 2.1±0.29 (mean±SE) young/breeding group. The 12 groups that made breeding attempts had a success rate of 92% (11 of 12). Fledging rate for the 11 productive pairs was 2.3±0.24. Of the 39 eggs followed in 2017, 21 (53.8%) hatched, 21 (53.8%) survived to banding age, and 21 (53.8%) fledged (Table 1). Birds that fledged included 16 females and 9 males (Table 2). Fourteen of these birds were retained and detected during the winter count and two were translocated to Great Dismal Swamp, NWR.

Table 1. Summary of 2016 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	4	3	3	3
Cluster 3	Yes	Yes	Unk	Unk	2	2
Cluster 5 (c1)	Yes	Yes	Unk	0	0	0
Cluster 5 (c2)	Yes	Yes	Unk	Unk	2	2
Cluster 6	Yes	Yes	3	3	3	3
Cluster 7	Yes	Yes	3	3	3	3
Cluster 8	Yes	Yes	7	3	3	3
Cluster 10	Yes	Yes	4	0	0	0
Cluster 11	Yes	Yes	4	2	2	2
Cluster 12	Yes	Yes	3	1	1	1
Cluster 13	Yes	Yes	3	3	3	3
Cluster 15	Yes	Yes	4	1	1	1
Cluster 17	Yes	No	-----	-----	-----	-----
Cluster 19	Yes	Yes	4	2	2	2
Total	13	13	>44	>25	25	25

Table 2. List of red-cockaded woodpecker nestlings banded within Piney Grove Preserve during the 2016 breeding season. Genders were determined during fledge checks.

Breeding Group	Date	USGS Band	Left	Right	SEX
Cluster 7	5/10/2017	2421-02957	BK/OR/BN	PK/AL	F
Cluster 7	5/10/2017	2421-02958	DB/GY/BK	PK/AL	F
Cluster 7	5/10/2017	2421-02959	GY/DB/LB	PK/AL	F
Cluster 8	5/13/2017	2421-02960	LB/DB/GY	AL/PK	F
Cluster 8	5/13/2017	2421-02961	LG/DB/LB	PK/AL	M
Cluster 8	5/13/2017	2421-02962	OR/DB/PK	PK/AL	F
Cluster 13	5/13/2017	2421-02963	PK/DB/WH	PK/AL	F
Cluster 13	5/13/2017	2421-02964	WH/DB/OR	PK/AL	M
Cluster 13	5/13/2017	2421-02965	YE/WH/BK	PK/AL	M
Cluster 3	5/17/2017	2421-02966	BK/OR/DB	PK/AL	M
Cluster 3	5/17/2017	2421-02967	DB/GY/BN	PK/AL	F
Cluster 19	5/17/2017	2421-02968	GY/DB/LG	PK/AL	F
Cluster 19	5/17/2017	2421-02969	LB/DB/GY	PK/AL	M
Cluster 11	5/17/2017	2421-02970	LG/DB/LB	PK/AL	M
Cluster 11	5/17/2017	2421-02971	OR/DB/YE	PK/AL	F
Cluster 6	5/24/2017	2421-02972	LG/DB/OR	PK/AL	F
Cluster 6	5/24/2017	2421-02973	YE/WH/OR	PK/AL	M
Cluster 15	5/23/2017	2421-02974	LG/DB/WH	PK/AL	M
Cluster 6	5/24/2017	2421-02975	WH/DB/YE	PK/AL	M
Cluster 12	5/29/2017	2421-02976	YE/WH/LG	PK/AL	F
Cluster 1	5/29/2017	2421-02977	OR/DB/LB	PK/AL	F

Breeding Group	Date	USGS Band	Left	Right	SEX
Cluster 1	5/29/2017	2421-02978	LG/DB/YE	PK/AL	F
Cluster 1	5/29/2017	2421-02979	BK/OR/LG	PK/AL	F
Cluster 5	6/1/2017	2421-02980	YE/WH/LB	PK/AL	F
Cluster 5	6/1/2017	2421-02981	LB/DB/OR	PK/AL	F

Breeding Details

Cluster 1 –The breeding male remains in this cluster (DG/YE/DG, WH/AL) for six consecutive breeding seasons, though this cluster did not attempt to breed in 2014 when all birds present were males. In the 2017 season, the laying female was unbanded and is likely the same bird from the 2015 and 2016 breeding season. Four eggs were recorded on 10 May in tree #54. Three young were documented on 24 May, and the young were banded on 29 May at 8 days of age (actual and physical age). Fledge checks on 20 June and 6 July identified all three birds as female. All three fledges were detected during the 2017-2018 winter head count, one each in Cluster 1, Cluster 15, and Cluster 17. Fall head counts were conducted within Clusters 1, 7, 11, 13, and 19 in an effort to identify hatching-year males and females as candidates for the Great Dismal Swamp National Wildlife Refuge RCWO reintroduction.

Cluster 3 – The breeding male (WH/AL, DB/RE/DB) remained for the second consecutive year. This marks the first breeding season for the female (YE/OR/YE, AL/YE). The pair nested in tree #179. Breeding activity was first documented on 29 April when the female was observed incubating. A subsequent nest check on 11 May revealed ≥2 chicks/eggs (egg shell observed in cavity with peeper and chick heard). Two hatchlings were banded on 17 May at 7 days of age (actual and physical age). A fledge check on 9 June identified 1 male and 1 female fledgling. The male fledge was identified during the 2017-2018 winter head count in Cluster 1.

Cluster 5 – The breeding male (LB/WH/LB, AL/DG) remained for the second consecutive year at Cluster 5. This was the first breeding season for the female (OR/WH/OR, AL/LB). The pair nested in newly finished cavity tree #262. Breeding activity was first documented on April 29th, with one of the birds incubating at that time. A subsequent check on 11 May found 1 egg, and incubation was observed on 2 June. Two young were observed on 7 June, and on 10 June, two young were banded at 6 and 7 days (physical age; keyed age 7 days for both). Both birds successfully fledged (one female, one unknown sex), and both were observed within Cluster 5 during the winter head count.

Cluster 6 –The breeding male (**(PU)**/YE/**(PU)**, AL/LB) remained for the second consecutive season. This was the first breeding season for the female (DB/RE/DB, AL/**(WH)**). No breeding activity was found on 29 April. Three eggs were observed on 10 May in cavity tree #268, and 3 young were observed on 17 May. All three young were

banded on 24 May (at physical and keyed age 8 days), and all three fledglings (two males, one female) were observed on 21 June. One of the males was observed in Cluster 6 during the winter head count.

Clusters 7 & 9 – The breeding male (OR/OR/OR, AL/DG) continued for the sixth consecutive year. The breeding female is presumed to be (LB/WH/OR, AL/DG), likely the breeding female for two consecutive years. The pair nested in a newly completed unmarked tree. Three eggs were observed on 29 April, and 3 young were banded at age 7 days (physical and keyed age) on 10 May. All three fledglings were observed on 24 May and all were identified as female at that time. During the winter head count, one Cluster 7 fledge was observed in Cluster 10, and another within Cluster 7.

Cluster 8 – The breeding pair here remained the same for the ninth consecutive year. The breeding male (LB/WH/LB, AL/**(DB)**) was originally banded in Cluster 5 in 2004 and the breeding female (LB/WH/LB, **(OR)**/AL) was originally banded in Cluster 5 in 2007. One egg was observed on 22 April in cavity tree #219, thought it was not present on 29 April. Seven eggs were observed on 30 May in cavity tree #809, suggesting at least two females contributed eggs to the nest after the initial failure. Three young were observed on 10 May. Three young were banded on 13 May at actual ages 6,7 and 8 days (keyed ages 5, 7 and 8 days). On 24 May, three all three fledges were observed (one male, one female, one unknown). During the winter head count, one fledge (female) was observed within Cluster 8.

Cluster 10 – This is the first breeding attempt for the male (OR/WH/OR, AL/DB), and the female has bred at this site for the 9th consecutive year. The pair used cavity #274 No eggs were detected on 30 April, 11 May, and 17 May. Four eggs were recorded on 24 May, 1 June, and 9 June. The breeding attempt failed as zero eggs were observed on 20 June.

Cluster 11 – The breeding male (YE/DB/YE, LB/AL) and the breeding female (OR/OR/DB **(rev)**, AL/DB) both paired for the fourth consecutive year. A newly completed unmarked tree was used as the nesting tree. The nest tree was observed to have 1 egg on 29 April, and 2 eggs and 2 young on 10 May. Two chicks were banded on 17 May (physical and keyed age 8 days) and two eggs remained in the cavity at the time of banding. Two fledges were observed on 29 May, and two fledges (one male and one female) on 9 June. One fledge (the male) was seen during the winter head count at Cluster 11.

Cluster 12 – The male (LG/LG/LG, AL/YE) and female (WH/LB/WH, AL/YE) paired for both of their first breeding attempt at this cluster. No activity was recorded on a 29 April visit. The pair nested in cavity tree #189. Two eggs were recorded on 10 May, three eggs on 17 May, and one young and two eggs on 24 May. The remaining two eggs did not hatch, and on 29 May one chick was banded at 7 days (physical and keyed age). The bird was identified as a female on a 9 June fledge check. This female was observed in Cluster 12 during the winter head count.

Cluster 13 – The breeding male (WH/RE/WH, AL/DB) and female (AL/LG, WH/**(PU)**/WH) continued for the second consecutive breeding season (and eighth season overall for the male). The pair nested in a newly completed untagged tree. Three eggs were observed on 30 April. Three young were observed on 11 May and three were banded on 13 May at age 6 days (physical and keyed ages). A fledge check on 24 May found two

males and one unknown sex fledge, and on 29 May it was confirmed that the remaining fledge was a female. One of the young of the year males was observed during the winter head count within Cluster 13. One hatching-year male from within this cluster was translocated to Great Dismal Swamp National Wildlife Refuge in support of the reintroduction efforts there.

Cluster 14 – This cluster was inactive during the 2017 season as a breeding cluster. No birds were observed roosting within this cluster during the spring 2017 headcount or the winter 2017-2018 headcount.

Cluster 15 – This was the first breeding attempt for the male (AL/RE, YE/DB/YE) and sixth consecutive year for breeding by the female (WH/LB/WH, **(PU)**/AL). These birds occupied tree #265 during the 2017 breeding season. No activity was observed on 29 April. Four eggs were observed on 10 May and 17 May, and three eggs and one chick were observed on 24 May. One chick was banded on 24 May at 6 days of age (physical and keyed age). During a cluster check on 9 June, the lone fledgling was observed and identified as a male. This young of the year was not observed during the winter head count.

Cluster 17 – No breeding activity was observed in the cluster during the 2017 season. Several birds were observed in this cluster during the spring and winter head counts.

Cluster 18 – No breeding activity was observed in the cluster during the 2017 season. A male (YE/**(LG)**/LG, AL/WH) was observed in the new (fall 2017) cavity inserts during the winter 2017-2018 head count, and two females were also observed interacting with the male during the winter head count.

Cluster 19 – This marked the 7th consecutive year that breeding has occurred at this site. The breeding male (OR/DB/OR, AL/LG) assumed reproductive duties in 2016. This was the first breeding attempt for the female (DB/DB/WH, AL/LB). The pair utilized tree #223 during the 2017 breeding season. Four eggs were observed on 30 April, and two eggs and two young on 10 May. Two chicks were banded on 17 May at age 8 days (physical and keyed age). During a 29 May cluster check, one male and one female fledgling were observed. The young of the year female was translocated to Great Dismal Swamp National Wildlife Refuge in support of the reintroduction program there, and the male was observed within Cluster 19 during the winter head count.

Population Monitoring

During the calendar year of 2017, 84 individual red-cockaded woodpeckers were identified within Piney Grove preserve (Tables 3&4). This included 59 birds that were hatched at Piney Grove during previous years and 25 nestlings that fledged during the 2017 breeding season. Eleven birds that had been produced during the 2016 breeding season were still present in the population during 2017. Forty birds (47%) were in their fourth year or more and seven birds (8.3%) were at least in their tenth year. Two birds were thirteen years old.

There were 27 birds detected in 2016 that were not detected in 2017. This includes the loss of 18 adults hatched prior to 2016 and 9 birds hatched in 2016. Five of the adults lost before the breeding season were previous breeders including males from C10, C15 and C18 and females from C13 and C19. The males from C10 and C15 were long-time breeders having bred consecutively for 7 and 6 years respectively.

Moving into the breeding season there were 53 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 and C-19. This was the lowest number of adults that Piney Grove has carried into the breeding season since 2013. The number of birds per cluster varied from one to eight with a mean of 3.8±0.46 (mean±SE). Clusters 10, 12, 18 and 19 had only the breeding pair present moving into the breeding season. Clusters eight and seven carried the most birds including eight and six respectively.

Sixty-nine birds were detected during the 2017 winter survey (Table 4). This represents a 26% increase (69 vs 54) from the winter of 2016 and is one more than the number carried into the 2015 breeding season. Birds present include 14 of the 25 birds fledged in 2017 and 55 adult birds hatched in previous years. There were 3 adult birds detected during the spring survey that were not detected during winter survey.

During the winter survey, birds were associated with 14 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, and C-19. 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 three to nine birds and averaged 4.9±0.47 (mean±SE) birds per group. As in past years, cluster 8 supported the largest foraging group with eight birds.

Table 3. Individual Red-Cockaded Woodpecker sightings during the spring 2017 survey within Piney Grove Preserve. Bold band colors between parentheses represent bands lost.

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Spring Cluster
1581-66270	DG/YE/DG	WH/AL	M	2006	1
821-70970	AL/DB	**(LG)**/YE/**(LG)**	M	2013	1
Unbanded	Unbanded	Unbanded	F	2013	1
2421-02944	LB/WH/OR	AL/DG	F	2016	1 & 7
2421-02916	AL/OR	LG/DB/LG	F	2015	1 & 19
821-70952	YE/**(OR)**/YE	AL/YE	F	2012	3
2421-02910	WH/AL **(rev)**	**(DB)**/RE/DB	M	2014	3
Unbanded	Unbanded	Unbanded	M	2015	3
2421-02952	LG/YE/LB	AL/YE	F	2016	3
821-70964	AL/WH	LG/YE/**(LG)**	F	2012	3
2421-02948	DB/WH/YE	AL/DB	F	2016	5
1581-66288	LB/WH/LB	AL/DG	M	2008	5
2421-02903	OR/WH/OR	AL/LB	F	2014	5

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Spring Cluster
1581-66300	AL/RE	LB/WH/LB	M	2009	5
2421-02949	LB/YE/DG	AL/LG	M	2016	5 & 6
1581-66253	DB/RE/DB	AL/**(WH)**	F	2004	6
821-70946	**(PU)**/YE/**(PU)**	AL/LB	M	2012	6
821-70977	AL/YE	**(PU)**/**(YE)**/**(PU)**	M	2013	6
2421-02950	LB/WH/DG	AL/LG	M	2016	6
2421-02943	DB/LG/YE	AL/DB	M	2016	7
821-70972	WH/**(PU)**/WH	AL/OR	M	2013	7
2421-02914	AL/DB	WH/**(PU)**/WH	M	2015	7
821-70901	OR/OR/OR	AL/DG	M	2009	7
2421-02941	LB/DB/OR	AL/DG	F	2016	8
2421-02942	LG/YE/WH	AL/LB	M	2016	8
1581-66251	LB/WH/LB	AL/**(DB)**	M	2004	8
1581-66278	LB/WH/LB	**(OR)**/AL	F	2007	8
2421-02927	YE/**(YE)**/**(DB)**	AL/WH	M	2015	8
821-70967	AL/OR	YE/YE/DB	M	2013	8
821-70994	YE/YE/DB	AL/LG	M	2014	8
821-70918	**(YE)**/DB/**(YE)**	**(YE)**/AL	M	2011	8
821-70963	AL/YE	LG/YE/LG	F	2012	10
2421-02929	OR/WH/OR	AL/DB	M	2015	10
821-70935	OR/OR/DB **(rev)**	AL/DB	F	2011	11
821-70919	YE/DB/YE	LB/AL	M	2011	11
821-70958	AL/WH	YE/MB/YE	M	2012	11
2421-02931	LG/LG/LG	AL/YE	M	2015	12
821-70988	WH/LB/WH	AL/YE	F	2014	12
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
2421-02907	AL/WH	YE/OR/YE	M	2014	13

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Spring Cluster
821-70929	YE/OR/YE	AL/WH	M	2011	13 & 7
2421-02945	AL/LB	LG/OR/WH	F	2016	15
821-70906	AL/RE	YE/DB/YE	M	2010	15
821-70933	WH/LB/WH	**(PU)**/AL	F	2011	15
821-70965	AL/LG	YE/YE/DB	F	2013	17 & 14
2421-02933	WH/LB/WH	AL/LB	M	2015	17
821-70949	AL/LG	WH/LB/WH	M	2012	17 & 5
821-70980	AL/LB	YE/OR/YE	F	2013	18
821-70923	YE/**(LG)**/LG	AL/WH	M	2011	18
821-70936	OR/DB/OR	AL/LG	M	2011	19
2421-02939	DB/DB/WH	AL/LB	F	2016	19
1581-66297	AL/**(RE)**	LG/YE/DG	F	2009	*
1581-66276	DG/YE/DG	OR/AL	F	2007	*
2421-02906	AL/OR	YE/OR/YE	M	2014	*
821-70983	AL/WH	WH/LB/WH	F	2013	*
821-70989	LG/LG/LG	AL/LG	M	2014	*
Total Number of RCWOs present during Spring 2017 Head Count					**58**

*Birds observed during fall or winter head count and presumably in Piney Grove during spring season.

Table 4. Individual Red-Cockaded Woodpecker sightings during the winter 2017-18 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
821-70970	AL/DB	**(LG)**/YE/**(LG)**	M	2013	1
Unbanded	Unbanded	Unbanded	F	2013	1
2421-02944	LB/WH/OR	AL/DG	F	2016	1
2421-02916	AL/OR	LG/DB/LG	F	2015	1
2421-02977	OR/DB/LB	HP/AL	F	2017	1
2421-02966	BK/OR/DB	HP/AL	M	2017	1
821-70952	YE/**(OR)**/YE	AL/YE	F	2012	3
2421-02910	WH/AL **(rev)**	**(DB)**/RE/DB	M	2014	3
Unbanded	Unbanded	Unbanded	M	2015	3
1581-66288	LB/WH/LB	AL/DG	M	2008	5
2421-02903	OR/WH/OR	AL/LB	F	2014	5
1581-66300	AL/RE	LB/WH/LB	M	2009	5
2421-02949	LB/YE/DG	AL/LG	M	2016	5
2421-02980	YE/WH/LB	HP/AL	F	2017	5
2421-02981	LB/DB/OR	HP/AL	F	2017	5
821-70983	AL/WH	WH/LB/WH	F	2013	5
2421-02948	DB/WH/YE	AL/DB	F	2016	6
1581-66253	DB/RE/DB	AL/**(WH)**	F	2004	6
821-70946	**(PU)**/YE/**(PU)**	AL/LB	M	2012	6
821-70977	AL/YE	**(PU)/(YE)/(PU)**	M	2013	6
2421-02975	WH/DB/YE	HP/AL	M	2017	6
1581-66297	AL/**(RE)**	LG/YE/DG	F	2009	6
2421-02943	DB/LG/YE	AL/DB	M	2016	7
821-70972	WH/**(PU)**/WH	AL/OR	M	2013	7

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Winter Cluster
2421-02914	AL/DB	WH/**(PU)**/WH	M	2015	7
821-70901	OR/OR/OR	AL/DG	M	2009	7
Unbanded	Unbanded	Unbanded	?	?	7
2421-02959	GY/DB/LB	HP/AL	F	2017	7
2421-02942	LG/YE/WH	AL/LB	M	2016	8
1581-66251	LB/WH/LB	AL/**(DB)**	M	2004	8
1581-66278	LB/WH/LB	**(OR)**/AL	F	2007	8
2421-02927	YE/**(YE)**/**(DB)**	AL/WH	M	2015	8
821-70967	AL/OR	YE/YE/DB	M	2013	8
821-70994	YE/YE/DB	AL/LG	M	2014	8
821-70918	**(YE)**/DB/**(YE)**	**(YE)**/AL	M	2011	8
2421-02960	LB/DB/GY	HP/AL	F	2017	8
2421-02941	LB/DB/OR	AL/DG	F	2016	10
821-70963	AL/YE	LG/YE/LG	F	2012	10
2421-02929	OR/WH/OR	AL/DB	M	2015	10
2421-02958	DB/GY/BK	HP/AL	F	2017	10
1581-66276	DG/YE/DG	OR/AL	F	2007	10
821-70935	OR/OR/DB **(rev)**	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
2421-02931	LG/LG/LG	AL/YE	M	2015	12
821-70988	WH/LB/WH	AL/YE (2)	F	2014	12
2421-02976	YE/WH/LG	HP/AL	F	2017	12
821-70989	LG/LG/LG	AL/LG	M	2014	12
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
2421-02907	AL/WH	YE/OR/YE	M	2014	13

USGS Band #	Left Leg	Right Leg	Sex	Hatch Year	Winter Cluster
2421-02964	WH/DB/OR	HP/AL	M	2017	13
821-70906	AL/RE	YE/DB/YE	M	2010	15
821-70933	WH/LB/WH	**(PU)**/AL	F	2011	15
2421-02979	BK/OR/LG	HP/AL	F	2017	15
2421-02945	AL/LB	LG/OR/WH	F	2016	15 & 8
821-70965	AL/LG	YE/YE/DB	F	2013	17
2421-02933	WH/LB/WH	AL/LB	M	2015	17
2421-02978	LG/DB/YE	HP/AL	F	2017	17
821-70949	AL/LG	WH/LB/WH	M	2012	17 & 5
2421-02952	LG/YE/LB	AL/YE	F	2016	18
821-70964	AL/WH	LG/YE/**(LG)**	F	2012	18
821-70923	YE/**(LG)**/LG	AL/WH	M	2011	18
821-70936	OR/DB/OR	AL/LG	M	2011	19
2421-02939	DB/DB/WH	AL/LB	F	2016	19
2421-02969	LB/DB/GY	HP/AL	M	2017	19
821-70929	YE/OR/YE	AL/WH	M	2011	7 & 19
Total Number of RCWOs present at Piney Grove Preserve during Winter 2017-18 Head Count					**69**

Translocation

Single male and female hatching-year birds were captured in Piney Grove Preserve on 20 October, 2017 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 21 October by removing the cavity screens. Both birds emerged successfully from cavities, calling and went up into the surrounding canopy to forage. The pair interacted and flew off to the northeast.

Table 5. Summary of translocation activities for red-cockaded woodpeckers from Piney Grove Preserve during the fall of 2017.

USGS Band	Left Leg	Right Leg	Sex	Date Moved	Origin	Destination
2421-02965	YE/WH/BK	PK/AL	M	10/20/17	PGP-C13	GDSNWR-YCC1
2421-02968	GY/DB/LG	PK/AL	F	10/20/17	PGP-C19	GDSNWR-YCC1

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