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# Investigation of Red-cockaded Woodpeckers in Virginia: 2013 report



**The Center for Conservation Biology  
College of William and Mary  
& Virginia Commonwealth University**

# Investigation of Red-cockaded Woodpeckers in Virginia: 2013 report

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Cover Photo: Spring morning at the Piney Grove Preserve. Photo by Bart J. Paxton.



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## EXECUTIVE SUMMARY

Red-cockaded woodpecker recovery at the Nature Conservancy's Piney Grove Preserve has been a monumental achievement. Over the past 10 years, monitoring and management has worked together to more than triple the number of breeding groups from a modern low of 3 in 2000 to the 10 groups breeding there now. The current level of success has culminated from more than a decade long path of habitat management, cavity tree management, woodpecker population monitoring and translocation. It has been through the intelligent decision making and skill in the field from all partners involved in Red-cockaded Woodpecker management in Virginia that has allowed extraordinary measures of success such as population growth, an increase in the number of pairs breeding, and high annual numbers of young produced.

This was the second consecutive year that 10 breeding groups fledged birds. These groups produced a total of 23 fledglings in 2013 following up only slightly behind the 26 young fledged in 2012. Over recent years, the reproductive output of the entire Piney Grove population has increased as a result of more groups breeding as well as a greater average number of young being fledged per nest.

A total of 77 Red-cockaded Woodpeckers were identified within the Piney Grove Preserve in 2013. This includes 53 adult birds and the 22 birds that fledged from the 2013 nests. There were 53 adult woodpeckers distributed into 10 groups when going into the breeding season. During the winter survey a total of 57 birds were detected that included 15 of the 23 birds fledged this year. There was movement of birds into two new cluster-sites between summer and winter. One of these sites represents the first natural pioneering event at the Preserve and possibly the only known such event in Virginia for over 25 years. This new site was established by excavation of a natural cavity into a tree located away from other clusters. The cavity has been monitored over the past year through construction but roosting by a male was only discovered during the 2013 winter. This male occupying this site is joined by a female bird that emanates from an unknown location. Another new site to become initiated in 2013 is an artificial recruitment cluster (C-12) that was occupied by a lone female bird in winter and was being joined by a male from a nearby occupied cluster (C-1). This site was used for a short-term spell by birds in one past winter but vacated by the next spring.

The Red-cockaded Woodpecker population continues to set high marks at Piney Grove Preserve for total breeding groups, numbers of individuals, and number of young produced annually. This collective result was only made possible from habitat improvements implemented over time. We have witnessed the population transform from one that required augmentation with translocated individuals for growth just a decade ago to a population that is positively maintaining itself through internal production and recruitment.

## BACKGROUND

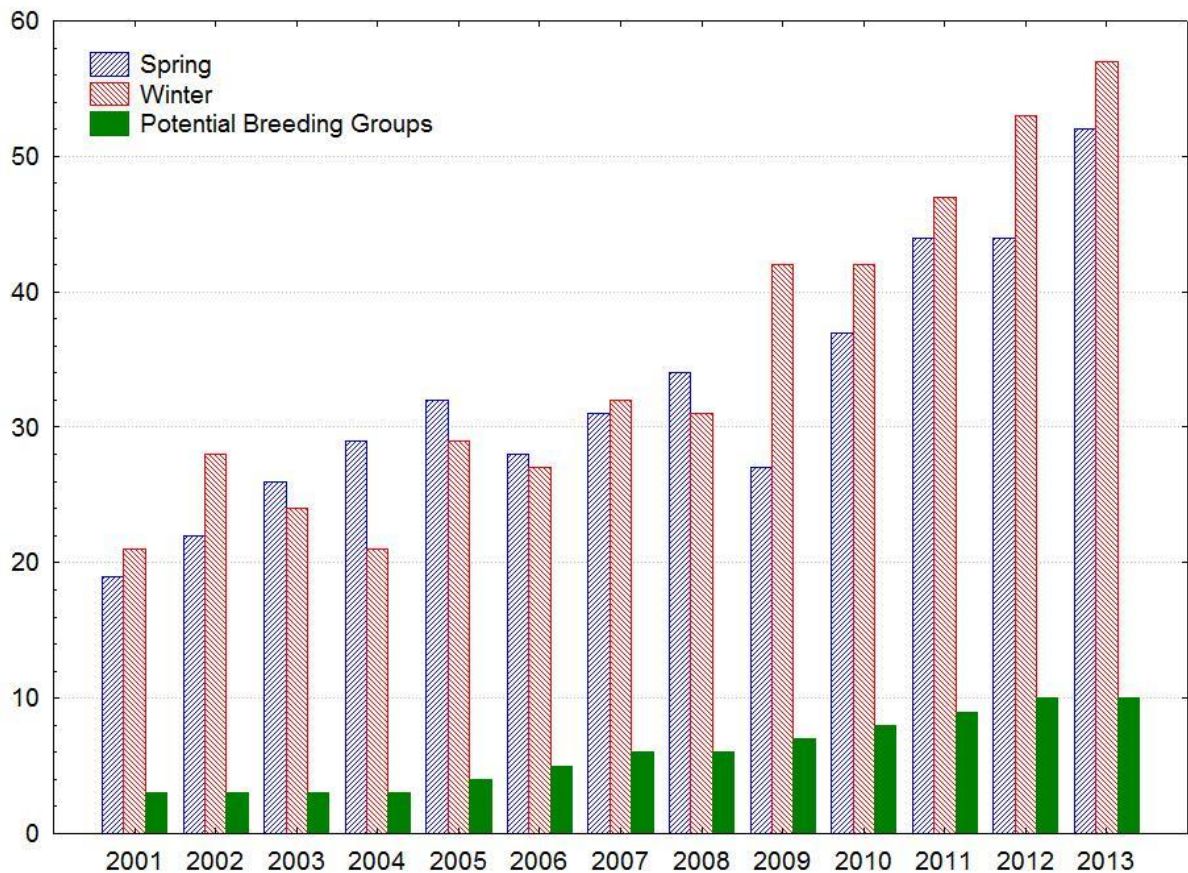
### Context

The Red-cockaded Woodpecker (*Picoides borealis*) is a federally endangered species. Within the past 100 years Red-cockaded Woodpeckers have disappeared completely from the northern portion of their breeding range. Historically, this species was recorded north into New Jersey and Pennsylvania. As recently as the 1930's and 1940's resident birds were known from the open maritime forests of Maryland. Since the recent loss of habitat in Kentucky, Virginia has supported the only population north of the Carolinas. In Virginia, breeding has continued to the present time but the number of both sites and birds has declined dramatically over the past 40 years. As recently as 1977, 23 clans were known scattered across 5 counties. In 1980, all clusters determined to be active in 1977 were surveyed in preparation for an investigation of habitat use (Bradshaw 1990). Of the 23 original clusters, only 9 were still forested. In the 4 years from 1977 to 1980, more than half of the known state population had been lost. By 1990, only 5 of the original 23 clusters detected in 1977 were still active. By 2000, this number had declined to only 2 clusters. During the breeding season of 2002, Virginia supported only 2 breeding pairs and 2 clusters with solitary males.

The Red-cockaded Woodpecker remains in eminent danger of extinction within Virginia. However, in 1998 a multi-organizational partnership was formed under the primary mission of stabilizing the population and restoring it back to pre-1980 levels. During that year, The Nature Conservancy negotiated a deal with Hancock Timber to purchase 1,100 ha of land supporting the last 3 known Red-cockaded Woodpecker breeding groups. The site has since been expanded and now includes 1,270 ha of pine land. The tract, located in Sussex County is named the Piney Grove Preserve and lies in the heart of the species former Virginia range. The site has become the nucleus for restoration work in Virginia.

Restoration of the Red-cockaded Woodpecker population in Virginia will require a long-term commitment and the use of aggressive techniques that have proven successful further south. Habitat management, population monitoring and management, and translocation of birds into the population have been ongoing since 2000 and have had dramatically positive results. Since 2001, the total population and the number of potential breeding clusters (defined as having 1 adult male and 1 adult female) have nearly tripled (Figure 1). In 2012, the Piney Grove Preserve population reached a new high of 10 breeding clusters that was maintained for 2013.





**Figure 1.** Spring and winter population counts and number of breeding groups for Red-cockaded woodpeckers at the Piney Grove Preserve.

## 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 2012 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**

### **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 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, both the breeding pair and the nest cavity from each cluster area were monitored closely to determine clutch initiation dates. Where cavity height permits,



breeding status is determined via the use of a miniature video camera mounted on an extendable pole. The pole can accommodate cavity heights to 50 ft. For cavities exceeding that height, breeding status was determined by visual monitoring of activity at the cavity. After dates of incubation were determined, an estimated hatching date was calculated. Nest cavities were monitored closely around the time of expected hatching to verify hatch dates. The window for banding was determined from estimated hatching dates.

All nestlings were banded during the recommended age window. Nest trees were climbed with ladders and nestlings were extracted from cavities using a noose apparatus. Nestlings were then lowered to the ground, banded, and returned to the cavity. 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. In the first 2 weeks after fledging, birds were identified and sex was determined by crown plumage.

### **General Observations**

As in previous years, 2 systematic surveys of all birds within Piney Grove were conducted to identify individuals and to determine distribution. Surveys were conducted in the early spring prior to the expected breeding window and in early winter after the expected dispersal period. All clusters were visited before dawn to count the number of individuals emerging from roost cavities and/or joining emerging birds to determine clan size. Birds were followed while foraging so that color band combinations could be read with spotting scopes. Biologists 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.

### **Cavity Monitoring and Management**

RCW cavity trees at Piney Grove are monitored each year to document changes in condition and use by RCW and other animals. Cavity trees are tagged with individual numbers, painted with a double white band, and mapped to facilitate monitoring. Each tree is assigned to a cluster area based on the proximity to an existing cluster and the RCW group that constructs the cavity. The cluster area assignment for a cavity tree does not change according to the RCW clan using the tree but rather is considered “captured” by the clan. To differentiate multiple cavities within a tree, each cavity, starting with the highest above ground, is assigned an alphabetical identifier. When a new cavity is discovered on a cavity tree the letter attributed to other cavities on the tree may change accordingly. Cavity monitoring and management consists of two parts: cavity tree status and cavity competitor inspection and removal. Monitoring and management in 2012 began in April and continued through June.

**Cavity Tree Status** – Cavity trees were visited at least once to evaluate tree condition and cavity characteristics. Changes to cavity status or cavity tree conditions were recorded as necessary on subsequent visits. Tree conditions that were recorded included: live or dead;

standing, broken, or fallen; evidence of beetle or other insect damage; lightning strike; and indications of red-heart disease (*Phellinus pini*).

Characteristics of each cavity were observed with binoculars and recorded to describe the physical condition of the cavity. The characteristics observed included: cavity origin and condition, the entrance and plate size, and the activity status. Activity status was determined by the presence or absence of chipping, fresh or recent sap flow, and dry sap. See Appendix I for 2012 cavity characteristics recorded for each cavity. Characteristics were categorized as follows:

Cavity

Natural – Constructed by an RCW  
Artificial – Cavity is a box installed in the tree

Status:

Unavailable - Cavity is no longer available  
Active: Chipping on resin wells to some degree with fresh or recent sap flow  
Possibly active: Slight but inconclusive evidence of RCW activity  
Inactive: No RCW chipping or sap flow  
Relic: No RCW activity for 4 or more years

Condition:

Complete – Natural cavity that is excavated enough for an RCW to occupy  
Complete (New) – Newly completed since last update  
Advanced Start: >10 centimeter depth but not completed  
Start: 1-10 centimeter depth  
Sub-start: Less than one centimeter depth  
Insert – Artificial cavity

Entrance:

Unavailable - Cavity is no longer available  
Normal - Normal size entrance  
<2X - Enlarged less than twice the normal diameter  
>2X - Enlarged two to four times the normal diameter  
>4X - Enlarged more than four times the normal diameter  
Restrictor plate reducing entrance to normal size  
Healing over

Plate size:

Unavailable - Cavity is no longer available  
>45 cm - Completed: Greater than 45 centimeter diameter plate  
30-45 cm - Completed: 30-45 centimeter diameter plate  
15-30 cm - Completed: 15-30 centimeter diameter plate

0-15 cm – Started but not completely encircling entrance: 0-15  
centimeter diameter plate  
Unstarted: No plate

Resin work:

Unavailable - Cavity is no longer available

Fresh: Some to all resin wells have chipping and bark scaled

Recent: Few resin wells have little chipping with little to no sap flow

Old: No recent RCW activity

Cavity competitor inspection and removal – All active, completed inactive cavities, and artificial cavity inserts within 50 ft from the ground were checked on a one-month cycle using a camera and monitor mounted on a telescoping pole. Data on competitors is only presented for April, May, and June 2011. When cavity competitors were located, the tree was climbed to remove the competitor or nest material. Amphibians, wasps and bird nests with a tending adult, fresh eggs, or nestlings were not removed.

## RESULTS

### Population Monitoring

During the calendar year of 2013, 77 Red-cockaded Woodpeckers were identified within Piney Grove preserve (Table 1). This included 53 birds that were hatched at Piney Grove from previous years and 22 fledglings produced during the 2013 breeding season.

In general, the Piney Grove Preserve population is a relatively young group with 54 % of the birds being  $\leq 3$  yrs old (Figure 2). Among the adult birds includes a 14 yr old male that hatched in 2000 that has also assumed breeding duties at his natal cluster since 2005. Red-cockaded woodpeckers of this age are rare and only a few have been reported that are greater than 12yrs old. Among all woodpeckers at Piney Grove, breeding opportunities appear to be an important factor to retention. Individuals that become breeders remain in the population for significantly longer amounts of time. The next two oldest birds are also breeders with one of them breeding annually since 2008 and the other since 2011.

There were 17 birds detected in 2012 that were not detected in 2013. This includes the loss of 14 more hatch year birds from 2012 and 3 adult birds hatched in previous years. This is the second consecutive year that no translocated birds were found in the population. It is likely that the direct contribution of that translocated breeding class for Piney Grove has reached an end but their indirect contribution will continue on for decades because the offspring of some translocated birds have also become breeders in later years.

There were 53 birds distributed into 10 breeding groups identified at the Piney Grove preserve going into the breeding season of 2013 (Table 1). This number sets a new high mark for the highest spring total that beats the previous high mark of 44 birds in the spring of 2012.

At the start of the breeding season, group sizes per cluster ranged from 2-8 birds with an average of 5.0 birds ( $\pm 2.00$  SD) birds per group. The smallest group of 2 birds was at Cluster 15 and groups as large as 8 birds could be found at Clusters 1 and 8. Cluster 3 remains relatively low for the second straight year where only 3 birds were present entering breeding seasons of 2012 and 2013. Cluster 3 is a natural and long standing cluster that has supported 4-7 birds in previous years.

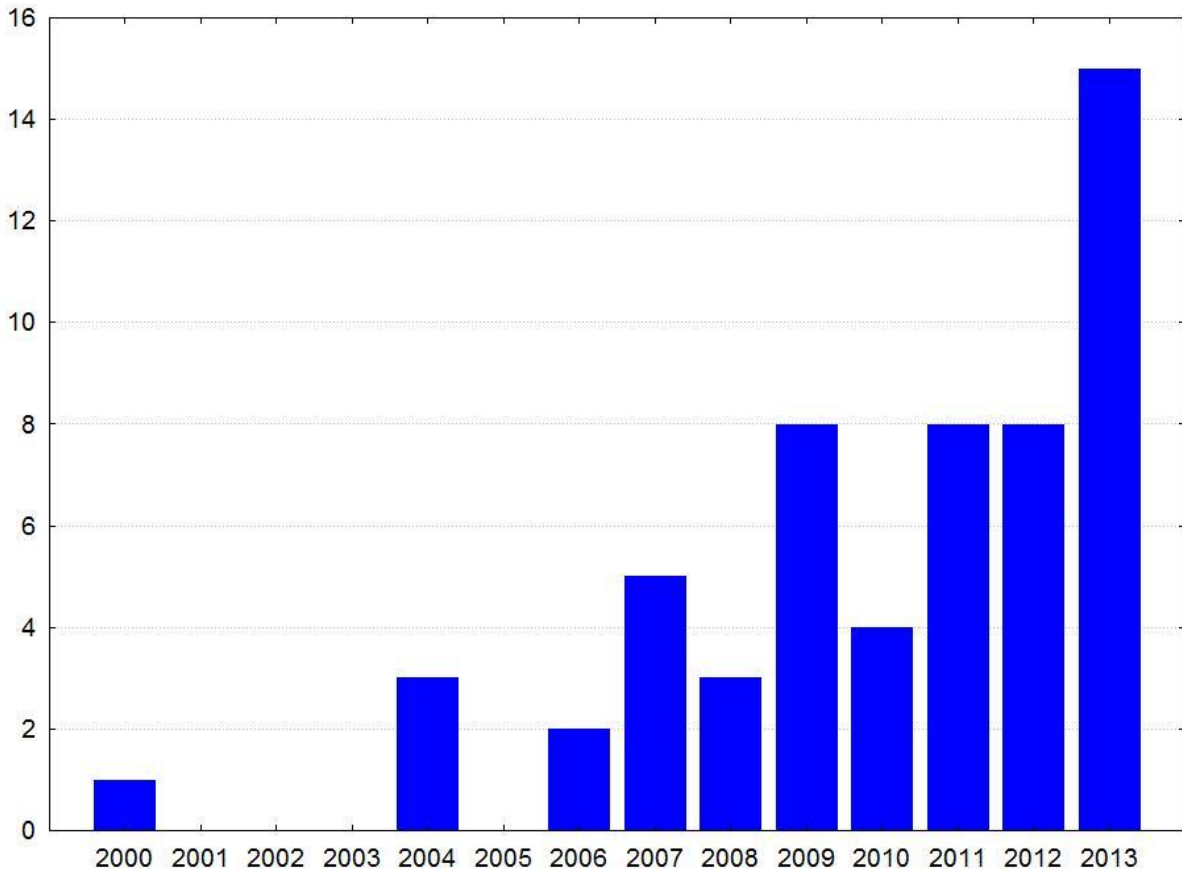


Figure 2. Age structure of the Red-cockaded Woodpecker population detected in winter at the Piney Grove Preserve. The year identifies age of hatching for every woodpecker currently in the population.

Fifty-seven birds were detected during the winter survey. This includes 16 of the 23 birds fledged in 2013 and 44 adult birds hatched in previous years. There were 12 adult birds detected during the spring survey that were not detected during winter survey. Conversely, there were two adult birds not detected during the spring survey that were found in winter. Both of these birds dispersed were occupying new clusters since 2012 so likely were not detected from their transient behavior. The retention rate of 2013 fledged birds from summer into winter was relatively higher (69%) than the previous two years (53% in 2012 and 48% in 2011) and is much more comparable to earlier years when 70-75% of the fledged birds from that year are typically found during the winter survey.

During the winter survey, birds were roosting in 13 different cluster areas including C-1, C-3, C-5, C-6, C-7, C-8, C-9 C-10, C-12, C-13, C-15, and C-19, and C-207 (Table 2). Cluster 207 (near C-18) represents a monumental pioneering event for the Piney Grove Preserve. This site was initiated by a male that excavated a cavity in a lone tree away from other cluster sites. It is the first time that a voluntary pioneering site has been established in Virginia since the 1980s. The male that roosts in this cavity is joined during foraging by a female bird that emanates from an unknown location. As in years past, the birds roosting in C-9 actively forage with the birds from C-7 so behave as one functional group. One bird roosted in C-12 that was joined from a bird immigrating from outside C-12, possibly C-1 but not confirmed. Group size in winter ranged from 2-8 birds and averaged 4.0 ( $\pm$  2.0 SD) birds per group.

### **Breeding Observations**

Successful breeding occurred in 10 Clusters this season that included C-1, C-3, C-5, C-6, C-7, C-8, C-10, C-13, C-15, and C-19. This is the second consecutive year that 10 breeding groups reproduced after that group number was reached for the first time in 2012. We missed detecting eggs or young at C-19 during breeding season work because they excavated and used two new trees outside the general recruitment cluster area. But it is very possible, if not likely, that this cluster reproduced by evidence of 2 hatch-year birds without bands that were found in clusters 1 and 19 in the winter of 2013. Both of these birds were captured for ageing and banding. We assume that C-19 could have likely produced these 2 fledglings that were unaccounted for during the breeding season monitoring. Including these two bird in the breeding results, there were a combined total of 23 chicks to fledge from the 10 successful nests (Table 3).

Cluster 1 – This was the second consecutive year for the breeding male (DG/YE/DG, WH/AL) and the fourth consecutive year for the breeding female (YE/YE/DB, AL/DB) at this cluster. There were several helpers identified that included a male (AL/OR, YE/LG/YE) that was originally hatched in C-1 in 2009 and has remained at this cluster since that time, and another male (LG/YE/LG, AL/WH), that was a 2011 hatch year bird from C-1. A new tree was chosen for nesting this year which marks the second consecutive year a new tree was used for breeding here. The appearance of four eggs was first identified on 3 May. Three of these 4 eggs hatched by 8 May while the unhatched egg remained in the nest on this day.

Only 2 of 3 nestlings successfully fledged. One hatch year bird was detected using this cluster during the winter.

**Table 1.** Occurrence of individual Red-cockaded Woodpeckers at Piney Grove Preserve 2008-2013. Only bird present in 2013 are shown.

USGS	Left Leg	Right Leg	Sex	Hatch Year	2008	2009	2010	2011	2012	2013
1581-66214	RE/DB	WH/AL	M	2000	X	X	X	X	X	X
1581-66253	DB/RE/DB	AL/WH	F	2004	X	X	X	X	X	X
1581-66251	LB/WH/LB	AL/DB	M	2004	X	X	X	X	X	X
1581-66257	LB/WH/LB	AL/RE	M	2005	X	X	X	X	X	X
1581-66270	DG/YE/DG	WH/AL	M	2006	X	X	X	X	X	X
1581-66271	DB/RE/DB	YE/AL	F	2006	X	X	X	X	X	X
1581-66273	WH/RE/WH	AL/WH	M	2007	X	X	X	X	X	X
1581-66276	DG/YE/DG	OR/AL	F	2007	X	X	X	X	X	X
1581-66274	WH/RE/WH	AL/DB	M	2007	X	X	X	X	X	X
1581-66280	YE/DB/YE	AL/YE	M	2007	X	X	X	X	X	X
1581-66278	LB/WH/LB	<b>OR</b> /AL	F	2007	X	X	X	X	X	X
1581-66285	DB/RE/DB	DB/AL	M	2008	X	X	X	X	X	X
1581-66288	LB/WH/LB	AL/DG	M	2008	X	X	X	X	X	X
1581-66290	YE/DB/YE	AL/PU	M	2008	X	X	X	X	X	X
1581-66291	WH/WH/WH	RE/AL	F	2008	X	X	X	X	X	X
1581-66296	DG/AL	YE/YE/DG	M	2009		X	X	X	X	X
1581-66297	AL/RE	YE/DG/YE	F	2009		X	X	X	X	X
1581-66300	AL/RE	LB/WH/LB	M	2009		X	X	X	X	X
1541-29902	AL/DB	WH/RE/WH	F	2009		X	X	X	X	X
1581-66293	YE/DB/YE	AL/LB	F	2009		X	X	X	X	X
1581-66299	AL/YE	DB/RE/DB	F	2009		X	X	X	X	X
1581-66294	YE/ <b>YE/DB</b>	AL/DB	F	2009		X	X	X	X	X
1581-66298	AL/DB	YE/DG/YE	F	2009		X	X	X	X	X
1541-29906	AL/DG	DB/RE/DB	M	2009		X	X	X	X	X
821-70901	OR/OR/OR	AL/DG	M	2009		X	X	X	X	X
821-70912	AL/OR	YE/LG/YE	M	2010			X	X	X	X
821-70910	AL/YE	YE/LG/YE	F	2010			X	X	X	X
821-70940	AL/WH	DB/RE/DB	M	2010			X	X	X	X
821-70906	AL/RE	YE/DB/YE	M	2010			X	X	X	X
821-70904	AL/LB	YE/DB/YE	M	2010			X	X	X	X
Unbanded			F	2010			X	X	X	X
821-70923	LG/YE/LG	AL/WH	M	2011				X	X	X
821-70935	OR/DB/OR	AL/DB	F	2011				X		X
821-70930	OR/OR/OR	AL/LG	F	2011				X	X	X
821-70918	YE/DB/YE	YE/AL	M	2011				X	X	X
821-70927	OR/OR/OR	AL/DB	M	2011				X	X	X
821-70929	YE/OR/YE	AL/WH	M	2011				X	X	X
821-70936	OR/DB/OR	AL/LG	M	2011				X	X	X
821-70919	YE/DB/YE	LB/AL	M	2011				X	X	X
821-70933	WH/LB/WH	PU/AL	F	2011				X	X	X



821-70941	AL/OR	DB/RE/DB	F	2011				X	X	X
821-70921	YE/DB/YE	RE/AL	M	2011				X	X	X
821-70963	AL/YE	LG/YE/LG	F	2012					X	X
821-70949	AL/LG	WH/LB/WH	M	2012					X	X
821-70948	AL/OR	WH/LB/WH	M	2012					X	X
821-70955	WH/PU/WH	AL/LG	M	2012					X	X
821-70950	AL/YE	WH/LB/WH	F	2012					X	X
821-70957	YE/MB/YE	AL/LG	F	2012					X	X
821-70959	AL/PU	YE/MB/YE	F	2012					X	X
821-70952	YE/OR/YE	AL/YE	F	2012					X	X
821-70953	YE/OR/YE	AL/LG	F	2012					X	X
821-70961	LG/DB/LG	AL/YE	F	2012					X	X
821-70946	PU/YE/PU	AL/LB	M	2012					X	X
821-70964	AL/WH	LG/YE/LG	F	2012					X	X
821-70975	AL/LG	OR/OR/OR	F	2013						X
821-70973	AL/LB	OR/OR/OR	M	2013						X
821-70974	AL/PU	OR/OR/OR	M	2013						X
821-70976	AL/OR	OR/OR/OR	F	2013						X
821-70980	AL/LB	YE/OR/YE	F	2013						X
821-70981	AL/LG	YE/OR/YE	F	2013						X
821-70982	OR/MB/OR	AL/WH	M	2013						X
821-70984	OR/AL	DB/RE/DB	F	2013						X
821-70985	LG/DB/LG	AL/DB	F	2013						X
821-70970	AL/DB	LG/YE/LG	M	2013						X
821-70968	AL/LB	LG/YE/LG		2013						X
821-70969	AL/OR	LG/YE/LG	F	2013						X
Unbanded			M	2013						X
Unbanded			F	2013						X
821-70983	AL/WH	WH/LB/WH	F	2013						X
821-70977	AL/YE	PU/YE/PU	M	2013						X
821-70978	AL/WH	PU/YE/PU	F	2013						X
821-70979	AL/LB	PU/YE/PU	M	2013						X
821-70971	WH/PU/WH	AL/LB	F	2013						X
821-70972	WH/PU/WH	AL/OR	M	2013						X
821-70965	AL/LG	YE/YE/DB	F	2013						X
821-70966	AL/LB	YE/YE/DB	F	2013						X
821-70967	AL/OR	YE/YE/DB	M	2013						X

Cluster 3 – The breeding male (RE/DB, WH/AL) remained the same since 2007. This is the oldest bird in the Piney Grove population and was originally banded in C-3 in 2000 as a nestling. A new breeding female (AL/RE, YE/DG/YE) stepped in this year with the disappearance of the former 2008-12 breeding female. The birds nested in the same tree (#179) as 2013. Breeding activity was first documented on 17 May with possible incubation and this behavior continued on another visit on 28 May. This cavity is too high to be examined by peeper scope and too awkward to be climbed for banding of nestlings.

Incubation behavior was first observed on 8 May and food delivery 23 May. Incubation and feeding of young was aided by a fifth-year male (DB/RE/DB, AL/DB) that was originally hatched in C-3. This male also helped last year. Nestlings were still observed in the nest as late as 21 June and on 24 June were first found to have fledged. One male and one female were produced. Neither of these birds could be banded as nestlings and 2 unbanded birds were observed in this cluster during winter.

Cluster 5 – The breeding male (LB/WH/LB, AL/RE) remained for a second consecutive year and mated with a female (AL/DB, YE/DG/YE) who served as breeder for the third consecutive year. At least two helpers were identified (AL/DB YE/DG/YE, and AL/OR, WH/LB/WH) during the feeding of young. The first egg was observed in tree #17 on 8 May. On 13 May the full clutch was identified as 2 eggs and both hatched before 23 May when each was estimated to be 2 days old. However, on 29 May there was only one nestling remaining in the nest. This lone nestling successfully fledged and was identified as a female. She was subsequently resighted at this cluster during the winter.

Cluster 6 – This the third year that birds successfully bred in this cluster. The breeding male (AL/DG, DB/RE/DB) remained the same as in the last two years. This bird was hatched in C-3 in 2008 and has occupied C-6 since 2009. Similar to the past 2 years, there were two females shared in breeding duties so it is difficult to ascertain which one was the genetic parent of the young birds. One female (AL/DB, WH/RE/WH) was hatched in C-7 and was first detected roosting in C-6 in the winter of 2010. The other female (DB/RE/DB, AL/WH) was hatched in C-3 in 2004 and roosted there for all years after until moving to C-6 when it was first detected roosting there in the spring of 2011. Breeding was first observed on 3 May when 6 eggs were detected in tree 137. On 13 May, all 6 nestlings were observed and presumed to be 2-3 days old. By 17 May, the number of nestlings was reduced to 3 and subsequently all of them successfully fledged. The fledglings were identified as 2 males and 1 female. Only one of these three birds was found in winter.

Cluster 7 – The breeding male (OR/OR/OR, AL/DG) and female (DB/RE/DB, YE/AL) remained as breeders. This was the 2<sup>nd</sup> consecutive year for the male and the 4<sup>th</sup> consecutive year for the female. This female then moved to Cluster 12 in the winter. A new tree (#216) was chosen as the nest cavity this year. This cavity was only discovered during the nesting season and appeared to be relatively new based on sap flow. The first breeding signal for this cluster was on 8 May when 3 eggs were found in the new cavity. All three eggs hatched approximately 11 May. By 17 May this number was reduced to 2 remaining nestlings, and subsequently 2 young were banded as 7 day nestlings on 18 May. Both young survived to fledge and were identified as one male and one female. Both of these fledglings were detected in Cluster 7 during the winter survey.

Cluster 8 – The breeding pair remained the same for the sixth consecutive year. The breeding male (LB/WH/LB, AL/DB) was originally banded in C-5 in 2004 and the breeding female (LB/WH/LB, OR/AL) was originally banded at C-5 in 2007. The pair nested in the same tree (#211) for the second consecutive year. Incubation was first detected on 3 May

when 5 eggs were detected. This is the 3<sup>rd</sup> consecutive year of a higher than usual egg count in this Cluster. In 2012 a total of 7 eggs were laid in the nesting cavity, although only 3 nestlings subsequently fledged. In 2013, 4 young hatched were first detected to be approximately 3 days old on 8 May (probable hatching date of 5 May). One broken, unhatched egg remained on the nest this day. In addition to the breeding pair, at least 3 birds helped with incubation and/or feeding: (AL/DG, YE/YE/DB)( AL/RE , YE/DB/YE,) (YE/DB/YE, YE/AL). All 3 chicks were banded on 17 May and estimated to be 7 days of development. All three chicks eventually fledged and were identified as 2 females and 1 male. All three fledglings occupied this same Cluster during the winter survey.

Cluster 10 – The same breeding male occupied this site for the 3<sup>rd</sup> consecutive year and the same breeding female for the 5<sup>th</sup> consecutive year. Four eggs were first detected on 3 May in a nest cavity they now have used for 3 consecutive years (#157). Based on the timing of observations between an empty nest and a full clutch it is likely that 27 April was the date when the first egg was laid. All four eggs hatched and 4 young were banded as 7-8 day old chicks on 17 May. In addition to the breeding pair, both WH/RE/WH, AL/WH, and OR/OR/OR, AL/DB helped with feeding young. The young were identified after fledging to be 2 males and 2 females. Only one female was detected again in the winter and that was found remaining in Cluster 10.

Cluster 13 – This was the fourth consecutive year breeding has been successful in this cluster with the original breeding birds of Cluster 13 remaining yet again. The male (WH/RE/WH, AL/DB) was a C-7 hatched bird from 2007 that began using C-13 in 2008. The breeding female (WH/WH/WH, RE/AL) was hatched at C-10 in 2008 and was first observed roosting at C-13 in the winter of 2009. One additional bird helped with the feeding of nestlings (YE/OR/YE, AL/WH). A new tree was chosen (#168) for nesting and 2 eggs were first detected on 8 May. On 17 May, 2 chicks hatched from these eggs and were estimated to be 2 days old. The 2 chicks were banded on 24 May and estimated to be 9-10 days old. Both chicks were identified as females in the nest and after fledging. Both remained in Cluster 13 during the winter survey.

Cluster 15 – This was the third consecutive year that a pair successfully bred in this cluster and the 2<sup>nd</sup> consecutive year for breeding by this male (YE/DB/YE, AL/YE) and female (WH/LB/WH, PU/AL). This pair occupies this site alone without the presence of additional helpers. Two eggs were first detected on 8 May in a newly excavated tree(#205) that was used for breeding for the 1<sup>st</sup> year. Only 1 of the 2 eggs hatched with a day 1 nestling being found on 17 May. On 24 May, this nestling was banded as an estimated 10-day old chick that was later identified as a male after successful fledging. The fledgling was not detected again during the winter survey.

Cluster 19 – This cluster likely bred for the second consecutive year but escaped detection in 2013. Two new trees were discovered more than 750m from the artificial cluster in late autumn. Circumstantial evidence for possible breeding here included the presence of one hatch year bird without bands that was detected in C-19 in winter along with another hatch

year bird that was not banded found in C-1. Both of these birds were captured and banded to allow age determination. Both of these non-banded birds were not expected during the winter survey since the only other two fledglings not banded from Cluster 3 were both believed to remain in Cluster 3 during the winter when the others were found. However, if this site was successful in 2013, there is no assurance to how many young were produced. We presume at least two individual fledged from this cluster. Both the breeding male (YE/DB/YE, AL, PU) and breeding female (unbanded bird believed from Cluster 3 that breed with this same male in C-15 two years ago) from the site's inaugural breeding season were present in the cluster in spring. Four other adult birds were present during the spring survey with all of these birds and the breeding male being also detected in winter. The older bird without bands (believed to be a breeder) was not found in winter.

### Translocations

No translocations of birds into Piney Grove have been conducted since 2005. The last 2 remaining translocated birds disappeared from Piney Grove in 2011.

**Table 2.** Foraging group clusters for Red-cockaded Woodpeckers detected within Piney Grove Preserve during the 2013 winter survey.

USGS	Left Leg	Right Leg	Sex	Hatch Year	Cluster
1581-66270	DG/YE/DG	WH/AL	M	2006	<b>1</b>
821-70912	AL/OR	YE/LG/YE	M	2010	<b>1</b>
821-70923	LG/YE/LG	AL/WH	M	2011	<b>1</b>
821-70963	AL/YE	LG/YE/LG	F	2012	<b>1</b>
821-70970	AL/DB	LG/YE/LG	M	2013	<b>1</b>
821-70984	OR/AL	DB/RE/DB	F	2013	<b>1</b>
1581-66214	RE/DB	WH/AL	M	2000	<b>3</b>
1581-66285	DB/RE/DB	DB/AL	M	2008	<b>3</b>
1581-66297	AL/RE	YE/DG/YE	F	2009	<b>3</b>
821-70952	YE/OR/YE	AL/YE	F	2012	<b>3</b>
Unbanded			M	2013	<b>3</b>
Unbanded			F	2013	<b>3</b>
1581-66257	LB/WH/LB	AL/RE	M	2005	<b>5</b>
1581-66288	LB/WH/LB	AL/DG	M	2008	<b>5</b>
1581-66300	AL/RE	LB/WH/LB	M	2009	<b>5</b>
821-70930	OR/OR/OR	AL/LG	F	2011	<b>5</b>
821-70949	AL/LG	WH/LB/WH	M	2012	<b>5</b>
821-70983	AL/WH	WH/LB/WH	F	2013	<b>5</b>
1581-66253	DB/RE/DB	AL/WH	F	2004	<b>6</b>
1541-29902	AL/DB	WH/RE/WH	F	2009	<b>6</b>

1541-29906	AL/DG	DB/RE/DB	M	2009	<b>6</b>
821-70946	PU/YE/PU	AL/LB	M	2012	<b>6</b>
821-70977	AL/YE	PU/YE/PU	M	2013	<b>6</b>
821-70901	OR/OR/OR	AL/DG	M	2009	<b>7</b>
821-70940	AL/WH	DB/RE/DB	M	2010	<b>7</b>
821-70955	WH/PU/WH	AL/LG	M	2012	<b>7</b>
821-70953	YE/OR/YE	AL/LG	F	2012	<b>7</b>
821-70971	WH/PU/WH	AL/LB	F	2013	<b>7</b>
821-70972	WH/PU/WH	AL/OR	M	2013	<b>7</b>
1581-66251	LB/WH/LB	AL/DB	M	2004	<b>8</b>
1581-66278	LB/WH/LB	<b>OR</b> /AL	F	2007	<b>8</b>
1581-66293	YE/DB/YE	AL/LB	F	2009	<b>8</b>
821-70906	AL/RE	YE/DB/YE	M	2010	<b>8</b>
821-70918	YE/DB/YE	YE/AL	M	2011	<b>8</b>
821-70965	AL/LG	YE/YE/DB	F	2013	<b>8</b>
821-70966	AL/LB	YE/YE/DB	F	2013	<b>8</b>
821-70967	AL/OR	YE/YE/DB	M	2013	<b>8</b>
1581-66273	WH/RE/WH	AL/WH	M	2007	<b>10</b>
1581-66276	DG/YE/DG	OR/AL	F	2007	<b>10</b>
821-70927	OR/OR/OR	AL/DB	M	2011	<b>10</b>
821-70975	AL/LG	OR/OR/OR	F	2013	<b>10</b>
1581-66271	DB/RE/DB	YE/AL	F	2006	<b>12</b>
1581-66296	DG/AL	YE/YE/DG	M	2009	<b>12</b>
1581-66274	WH/RE/WH	AL/DB	M	2007	<b>13</b>
1581-66291	WH/WH/WH	RE/AL	F	2008	<b>13</b>
821-70929	YE/OR/YE	AL/WH	M	2011	<b>13</b>
821-70980	AL/LB	YE/OR/YE	F	2013	<b>13</b>
821-70981	AL/LG	YE/OR/YE	F	2013	<b>13</b>
1581-66280	YE/DB/YE	AL/YE	M	2007	<b>15</b>
821-70933	WH/LB/WH	PU/AL	F	2011	<b>15</b>
1581-66299	AL/YE	DB/RE/DB	F	2009	<b>19</b>
821-70904	AL/LB	YE/DB/YE	M	2010	<b>19</b>
821-70936	OR/DB/OR	AL/LG	M	2011	<b>19</b>
821-70961	LG/DB/LG	AL/YE	F	2012	<b>19</b>
821-70985	LG/DB/LG	AL/DB	F	2013	<b>19</b>
821-70921	YE/DB/YE	RE/AL	M	2011	<b>207</b>
821-70964	AL/WH	LG/YE/LG	F	2012	<b>207</b>

## **Cavity Tree Status**

By the end of December 2013, Piney Grove contained 213 cavities in 194 live trees including 65 start cavities, 71 completed natural cavities, and 77 artificial inserts. A total of 36 new cavities or new cavity starts were added to the number of known cavities. Five trees were found containing two newly completed natural cavities and six cavity starts. Four starts were discovered in previously tagged cavity trees. Eleven artificial insert cavities were installed in cluster areas 6 (2 inserts), 12 (2 inserts), 13 (2 inserts), 15 (2 inserts) and 19 (3 inserts). There were no recorded cavity or start tree deaths.

## **Cavity competitor inspection and removal**

Two cavity peeper scopes malfunctioned during the peak of the breeding season in 2013. Because of this, the number of cavity inspection trips was reduced with the thought that it would resume in early spring 2014. A database for condition of all trees and cavities is pending for 2014 and not included as usual in this report.

There were 13 instances of cavity competitors and 1 instance of nest material in RCW cavities during April and May 2013. Multiple cavity competitor species occurring simultaneously in a cavity were counted as separate instances. Multiple individuals of one species found together in a cavity were counted as one instance. A total of 4 flying squirrels were encountered on 3 instances in clusters 9, 10, and 18. The nest material was found in a tree where a flying squirrel was previously removed indicating that other squirrels were present at that location.

The other instances of cavity competitors encountered were nesting birds. Ten bird nests with eggs or nestlings (not including RCW nests) were found in cavities. The bird identified at 5 of the 10 nests was the white-breasted nuthatch (*Sitta carolinensis*). Eastern bluebirds (*Sialia sialis*) were associated with 3 nests. One cavity was occupied by a nesting Northern flicker (*Colaptes auratus*). One bird nest was constructed by an unidentified species of bird. All of the cavities utilized by other birds and flying squirrels were artificial inserts except for one of the white-breasted nuthatch nests and the Northern flicker nest which were within enlarged natural cavities.



**Table 3.** Red-cockaded Woodpecker nestlings that were banded and successfully fledged at the Piney Grove Preserve in 2013.

Cluster	USGS	Left Leg	Right Leg	Sex	Band Date	Age at Banding
1	821-70969	AL/OR	LG/YE/LG	F	5/14/2013	8
1	821-70970	AL/DB	LG/YE/LG	M	5/14/2013	8
3	Unbanded			M		
3	Unbanded			F		
5	821-70983	AL/WH	WH/LB/WH	F	5/29/2013	7
6	821-70977	AL/YE	PU/YE/PU	M	5/18/2013	6
6	821-70978	AL/WH	PU/YE/PU	F	5/18/2013	6
6	821-70979	AL/LB	PU/YE/PU	M	5/18/2013	6
7	821-70971	WH/PU/WH	AL/LB	F	5/18/2013	7
7	821-70972	WH/PU/WH	AL/OR	M	5/18/2013	7
8	821-70965	AL/LG	YE/YE/DB	F	5/14/2013	7
8	821-70966	AL/LB	YE/YE/DB	F	5/14/2013	7
8	821-70967	AL/OR	YE/YE/DB	M	5/14/2013	7
10	821-70973	AL/LB	OR/OR/OR	M	5/14/2013	7
10	821-70974	AL/PU	OR/OR/OR	M	5/14/2013	7
10	821-70975	AL/LG	OR/OR/OR	F	5/14/2013	7
10	821-70976	AL/OR	OR/OR/OR	F	5/14/2013	7
13	821-70980	AL/LB	YE/OR/YE	F	5/24/2013	10
13	821-70981	AL/LG	YE/OR/YE	F	5/24/2013	10
15	821-70982	OR/MB/OR	AL/WH	M	5/24/2013	8
19	821-70984	OR/AL	DB/RE/DB	F	12/14/2013	HY
19	821-70985	LG/DB/LG	AL/DB	F	12/18/2013	HY

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