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Investigation of red-cockaded woodpeckers in Virginia: 2010 report

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Cover Photo: View of Cluster 3 from the vantage point of a Red-cockaded Woodpecker nesting cavity 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

During the calendar year of 2010, 57 Red-cockaded Woodpeckers were identified within the Nature Conservancy's Piney Grove Preserve. This included 37 birds that were hatched at Piney Grove from previous years, 18 fledglings produced during the 2010 breeding season, and 2 birds translocated to Piney Grove in previous years.

A collaborative effort of habitat management, population monitoring and management, and translocation of birds into the population have been ongoing at the Preserve since 2000 has had dramatically positive results. Since 2001, the total population and the number of potential breeding clusters have more than doubled.

Thirty-five adult birds were believed to be present within the Piney Grove Preserve going into the breeding season of 2010. This is the highest spring total since monitoring began at the Preserve. Seven successful breeding attempts were documented during the 2010 season at C-1, C-3, C-5, C-7, C-8, C10 and C13. Breeding productivity for the 2010 season netted a combined total of 18 chicks that survived to fledge.

Forty-two birds were detected during the winter survey. This includes 12 of the 18 birds that fledged in 2010. In the winter assessment, birds were roosting in 11 different cluster areas including C-1, C-3, C-4, C-5, C-6, C-7, C-8, C-9 C-10, C-13, and C-15. As in years past, the single bird roosting in C-4 was part of the C-3 clan. A single bird from C-9 joined the foraging group from C-7, and two birds roosting in C-15 joined the C-8 group.

In 2010, Piney Grove contained 159 cavities in live trees including 42 start cavities, 52 completed cavities, and 65 artificial inserts. Sixteen new cavities or new cavity starts were added to the number of known cavities this past year. Six trees died between 2009 and 2010 resulting in a loss of nine cavities or cavity starts. Six new trees were found with newly completed natural cavities and four cavity starts. Six artificial inserts were installed in new trees creating two new recruitment clusters, C17 and C18. One unrecorded relic cavity and three starts were discovered in previously tagged cavity trees.

There were 37 instances of cavity competitors or nest material in RCW cavities during the April, May and June 2010. Southern flying squirrels accounted for 11 of the 37 occurrences. A total of 19 individual flying squirrels were removed on 11 occasions from eight of the 117 available cavity trees. Other species found include white-breasted nuthatch, tufted titmouse, great-crested flycatcher, unidentified snake species, and unidentified bee and wasp species.

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 doubled (Figures 1 & 2).

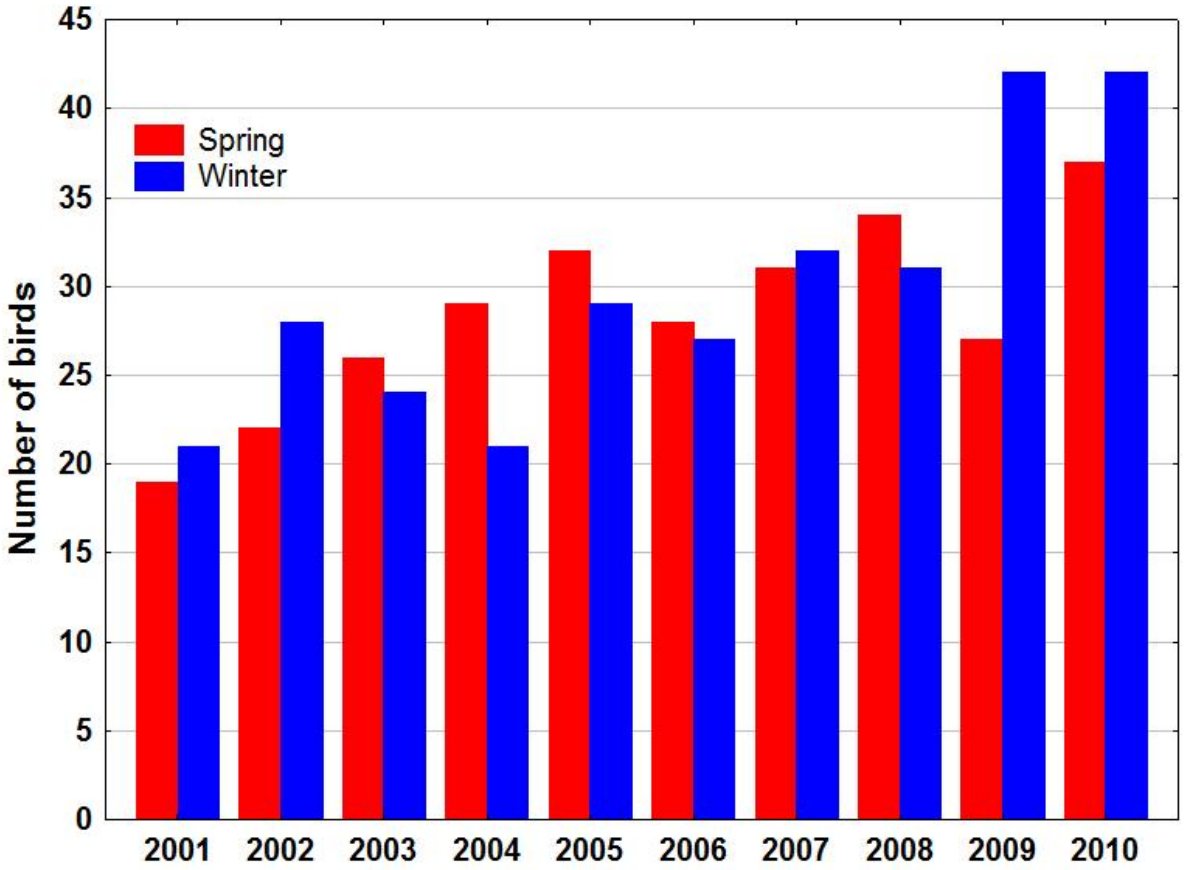

Figure 1. Spring and winter population counts for Red-cockaded woodpeckers at the Piney Grove Preserve.

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 2010 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.

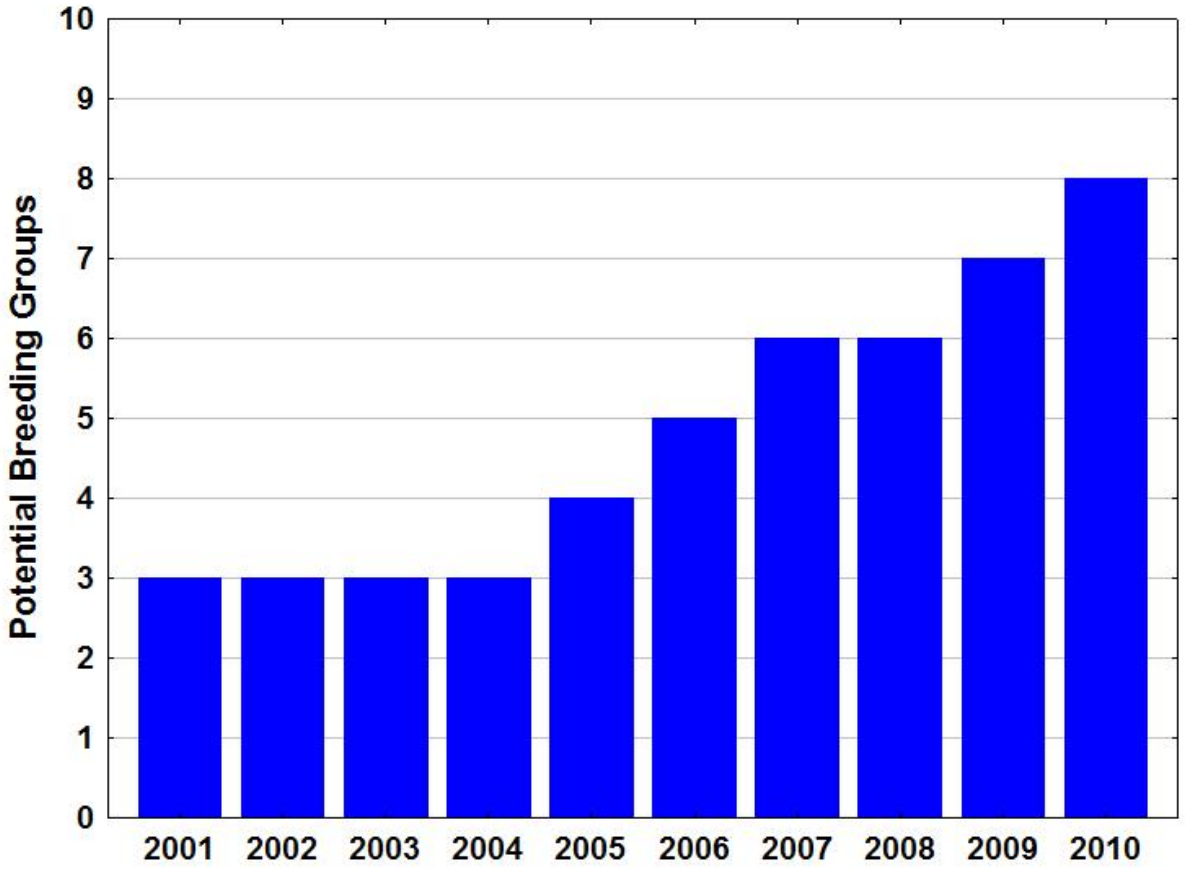

Figure 2. The number of potential breeding groups of Red-cockaded Woodpeckers at the Piney Grove Preserve.

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. There are now 15 independent cluster sites with either natural or 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

Cavity tree status – Data on the status of each cavity tree were collected during March and April 2009. Each cavity tree was visited once for 2009 from January through July to evaluate tree characteristics and characteristics for each cavity on the tree. Tree condition was categorized into the following: live or dead; standing, broken, or fallen; beetles; lightning strike; and red heart disease. Characteristics of each cavity were collected to describe its condition, entrance, plate, and activity status (Appendix I). Cavity characteristics were categorized as follows:

Cavity stage/ 09 Condition:

1-Complete – Natural cavity
2-Complete (New) – Newly completed since last update
3-Advanced Start: > 10 cm centimeter depth
4-Start: 1-10 cm depth
5-Sub-start: Less than one centimeter depth
6-Insert – Artificial cavity

Entrance enlargement:

0-Gone
1-Normal size entrance
2-Enlarged less than twice the normal diameter
3-Enlarged two to four times the normal diameter
4-Enlarged more than four times the normal diameter
R-Restrictor plate reducing entrance to normal size
H-Healing over

Activity:

1-Active: Chipping on resin wells to some degree with fresh sap flow
2-Possibly active: Slight but inconclusive evidence of RCW activity
3-Inactive: No recent RCW activity
4-Relic: No RCW activity for 4 years

Plate size:

5-Unstarted: No plate
4-Started: 0-15 cm diameter plate
3-Completed: 15-30 cm diameter plate

2-Completed: 30-45 cm diameter plate
1-Completed: Greater than 45 cm diameter plate

Chipping on resin wells:

4-Old: No recent RCW activity
3-Recent: Few resin wells have little chipping with little to no sap flow
2-Fresh: Most of resin wells have chipping and bark scaled slightly
1-Fresh: All resin wells have chipping and bark scaled extensively

Sap (applies to fresh and dry):

4-None
3-Less than 1 m of sap flow above and below the cavity
2-One to 2 m of sap flow above and below the cavity
1-Greater than 2m of sap flow above and below cavity around circumference of tree at cavity height

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 2010. 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.

Historic Sites

Historic sites were not visited this season since most have been degraded and no longer have the potential to support RCWs.

RESULTS

Population Monitoring

During the calendar year of 2010, 57 Red-cockaded Woodpeckers were identified within Piney Grove preserve (Table 1). This included 37 birds that were hatched at Piney Grove from previous years, 18 fledglings produced during the 2010 breeding season, 2 birds translocated to Piney Grove in previous years.

Among the 37 birds detected in 2010 that were originally hatched at Piney Grove, 2 of these were hatched in 2000, 2 hatched in 2004, 4 hatched in 2005, 3 hatched in 2006, 6 hatched in 2007, 8 hatched in 2008 and 12 hatched in 2009. The 2 translocated birds remaining in the population in 2010 were moved here from the Carolina Sandhills National Wildlife Refuge (NWR) in 2002 and 2003.

There were 7 birds detected in 2009 that were not detected in 2010. This includes 1 bird hatched at Piney Grove in 2005, 1 bird hatched at Piney Grove in 2006, 1 bird hatched at

Piney Grove in 2007, 3 birds hatched at Piney Grove in 2009, and 1 bird translocated from the Carolina Sandhills NWR in 2005.

Thirty-five adult birds were believed to be present within the Piney Grove Preserve going into the breeding season of 2010 (Table 1). This is the highest spring total since monitoring began at the Preserve and was also markedly higher than the 28 birds counted in the spring of 2009 and more than double the lowest population count of 16 birds from 2002.

Forty-two birds were detected during the winter survey. This includes 28 birds hatched at Piney Grove before 2010, 12 of the 18 birds fledged in 2009, and 2 translocated birds. There were 8 adult birds that were not observed in the winter survey but detected during the spring survey and 1 adult detected in winter that was not observed during the spring.

In the winter assessment, birds were roosting in 11 different cluster areas including C-1, C-3, C-4, C-5, C-6, C-7, C-8, C-9 C-10, C-13, and C-15 (Table 2). As in years past, the single bird roosting in C-4 was part of the C-3 clan. A single bird from C-9 joined the foraging group from C-7. Also, a single bird roosting in C-15 joined the C-8 group.

Breeding Observations

Seven successful breeding attempts were documented during the 2010 season at C-1, C-3, C-5, C-7, C-8, C10 and C13. A combined total of 18 chicks survived to fledge.

Cluster 1 – The breeding male (AL/OR, DB/DB/WH) in 2010 has remained as the same individual since 2007 marking the fourth consecutive year this male assumed reproductive duties. This male was translocated from Carolina Sandhills NWR in 2002. The breeding female (YE/YE/DB, AL/DB) was new this year (note: this color bands on the left leg of this bird shifted from 2009). The new breeding female was originally hatched at C-8 in 2009. The 2009 breeding female was not detected in the population in 2010 after a two-year stint as a breeder in C-1 during the 2008 and 2009 breeding seasons. Incubation duties were also augmented by at least one helper male (DG/YE/DG, WH/AL) that was originally hatched in C-1 in 2006 and has remained at this cluster since that time. Two eggs were detected in tree # 54 on 26 April. This was the first year this tree was used for breeding. A full clutch of 4 eggs were discovered on 30 April. Hatched nestlings were first observed on 10 May and estimated to be 2 days old. On 18 May 3 of 4 nestlings were banded and estimated to be 7-8 days of development. The remaining nestling could not be removed from the cavity. Only 3 of 4 nestlings were observed to fledge during a visit on 8 June. The C-1 cohort was identified as two males and one female. Only 2 of the 3 fledgling birds were observed during the winter survey in C-1 (missing one male).

Cluster 3 – The breeding male (RE/DB, WH/AL) remained the same since 2007 (note this bird has lost the DB band on left leg). This was the fourth consecutive year this male held breeding status. It is presumed that breeding female (LB/WH/LB, RE/AL) remained the same since 2008 since this bird was observed incubating and brooding young. This is the third consecutive year this female would have assumed breeding duties. Incubation was

aided by a second-year female (LB/WH/LB, AL/PU) and feeding of young was aided by at least one other one-year old helper male (OR/OR/OR, AL/DG). The birds nested in a new tree (#179) this season after occupying tree #8 for four consecutive years. This cavity is too high to be examined by peeper scope. Incubation behavior was first observed on 22 April. The nestlings could not be extracted for banding. On 27 May two male nestlings and one female nestling were observed being feed at the cavity entrance. All three birds successfully fledged. Only two unbanded birds were detected during the winter survey.

Cluster 5 – The breeding pair makeup at this cluster has changed for the first time since 2007. The breeding male (WH/LB/WH, PU/AL) has remained the same. This male was originally banded as a nestling at C-5 in 2000. A new breeding female (YE/DG/YE, DB/AL) replaced the 2007-2009 breeding female (AL/MV, MV/MV/WH) that was not found in the population in 2010. An additional male (LB/WH/LB, AL/RE) was seen helping in all breeding activities from incubating, brooding, and feeding young. The breeding pair nested in a new tree (# 23) after spending the previous 4 years in tree # 26. This nest cavity that was too high be examined with the peeper scope. Incubation was first detected on 30 April. On 18 May 4 nestlings were banded at 9-10 days age. All 4 nestlings successfully fledged and were identified as 2 males and 2 females on 8 June. Only 1 male fledge was observed during the winter survey.

Cluster 7 – The breeding male (AL/YE, YE/YE/WH) remained the same since 2005. This bird was translocated to C-7 from Carolina Sandhills, NWR in 2003 and has been present within this cluster since that time. To date, it has been the only male to breed at this cluster. The breeding female (DB/RE/DB, YE/AL) remained the same for the second consecutive year. This female was hatched at C-3 in 2006 but was first detected using C-7 in 2007. Three regular sized eggs and one undersized egg were first discovered in a new nest cavity on 30 April. This was the second consecutive year the breeding pair nested in a new cavity. The first egg hatched on 8 May and on 18 May 3 nestlings were observed and the undersized eggs was still in the nest. We banded 2 of 3 nestlings on 18 May. The last chick could not be extracted from the cavity. There was a large disparity in size of the nestlings. Two of the nestlings showed characteristics of 8-9 day chicks as expected with their actual age. However, the third chick was underdeveloped and had characteristics comparable with a 5 day old chick. Only the more developed young fledged and were identified as one male and one female (unbanded) on 8 June. Only the male fledgling was detected in the population during winter surveys.

Table 1. Occurrence of individual Red-cockaded Woodpeckers at Piney Grove Preserve 2002-2009. (X_j indicates 2010 hatch-year bird that fledged) (X? indicates that the identity of 1 unbanded hatch year bird could not be determined between two individuals during the 2010 winter survey).

USGS Band	Left Leg	Right Leg	Sex	2002	2003	2004	2005	2006	2007	2008	2009	2010	2010
												Spr	Winter
C-3 Unbanded	Unbanded	Unbanded	U	X	X	X							
C-5 Unbanded	Unbanded	Unbanded	M	X	X	X	X						
1581-66201	WH/LB/WH	RE/AL	M										
1581-66202	WH/LB/WH	LG/AL	M	X	X	X	X						
1581-66203	RE/DB/RE	YE/AL	F	X	X								
1581-66204	RE/DB/RE	PU1/AL	F										
1581-66205	RE/DB/RE	DG/AL	M	X	X								
1581-66206	DG/YE/DG	DB/AL	M										
1581-66207	WH/LB/WH	WH/AL	F	X	X	X	X	X					
1581-66208	RE/DB/RE	PK1/AL	U										
1581-66209	DG/YE/DG	PU/AL	F										
1581-66210	WH/LB/WH	DB1/AL	U										
1581-66211	DG/YE/DG	RE1/AL	F										
1581-66212	WH/LB/WH	YE/AL	M	X	X	X	X						
1581-66213	WH/LB/WH	DB2/AL	F										
1581-66214	RE/DB	WH/AL	M	X	X	X	X	X	X	X	X	X	X
1581-66215	RE/DB	LG1/AL	U	X	X	X							
1581-66216	RE/DB	RE1/AL	U										
1581-66219	DG/YE/DG	WH/AL	M	X									
1581-66220	WH/LB/WH	PU/AL	U			X	X		X	X	X	X	X
1581-66221	WH/LB/WH	PK1/AL	U										
1581-66222	WH/LB/WH	AL/RE	U										
1581-66223	DG/YE/DG	YE/AL	F										
1581-66224	DG/YE/DG	RE2/AL	M	X	X	X	X	X					
1581-66225	RE/DB/RE	RE2/AL	M										
1581-66226	RE/DB/RE	LG2/AL	F										
1581-66227	RE/DB/RE	PK2/AL	M	X									
1581-66228	RE/DB/RE	PU2/AL	M	X	X	X							
1581-66229	WH/LB/WH	DG/AL	F	X									
1581-66230	WH/LB/WH	AL/YE	F	X	X	X	X	X	X				
1581-66231	WH/LB/WH	PK2/AL	M	X	X	X	X	X	X				
1581-66232	WH/LB/WH	AL/DB	M	X	X								
1581-66233	WH/LB/WH	AL/LB	F	X	X								
1581-66234	RE/DB/RE	AL/YE	F	X	X								
1581-66235	RE/DB/RE	AL/RE	F	X	X		X						
1581-66236	RE/DB/RE	AL/DB	M	X									
1581-66237	WH/LB/WH	AL/RE	M		X		X						
1581-66238	WH/LB/WH	AL/PU	F		X	X				X			

USGS Band	Left Leg	Right Leg	Sex	2002	2003	2004	2005	2006	2007	2008	2009	2010 Spr	2010 Winter
1581-66239	WH/LB/WH	AL/DG	U		X								
1581-66240	WH/LB/WH	AL/LG	M		X								
1581-66241	DG/YE/DG	AL/LG	F			X							
1581-66242	RE/DB/RE	AL/LB	F		X	X							
1581-66243	RE/DB/RE	AL/PK	F		X								
1581-66244	RE/DB/RE	AL/DG	M		X	X							
1581-66245	DG/YE/DG	AL/LB	M		X	X	X	X					
1581-66246	DG/YE/DG	AL/PU	U		X								
1581-66247	DG/YE/DG	AL/WH	U			X							
1581-66248	DG/YE/DG	AL/PU	M			X							
1581-66249	DG/YE/DG	AL/DB	U			X							
1581-66250	LB/WH/LB	AL/PK	M			X	X						
1581-66251	LB/WH/LB	AL/DB	M			X	X	X	X	X	X	X	X
1581-66252	LB/WH/LB	AL/LB	F			X	X						
1581-66253	DB/RE/DB	AL/WH	F			X	X	X	X	X	X	X	
1581-66254	DB/RE/DB	AL/RE	M			X	X		X	X			
1581-66256	LB/WH/LB	AL/OR	F				X						
1581-66257	LB/WH/LB	AL/RE	M				X	X	X	X	X		
1581-66258	LB/WH/LB	AL/YE	F				X	X	X	X	X		
1581-66259	DG/YE/DG	AL/DG	F				X						
1581-66260	DG/YE/DG	AL/OR	F				X						
1581-66261	DB/RE/DB	AL/DB	M				X	X	X	X	X	X	
1581-66262	DB/RE/DB	AL/YE	F				X						
1581-66263	DB/RE/DB	AL/PU	F				X	X		X	X	X	
1581-66264	WH/RE/WH	AL/DG	F				X	X	X		X	X	
1581-66265	LB/WH/LB	AL/WH	F					X	X	X	X		
1581-66266	LB/WH/LB	RE/AL	F					X	X	X	X	X	X
1581-66267	WH/RE/WH	AL/RE	F					X					
1581-66268	WH/RE/WH	AL/YE	M					X	X	X			
1581-66269	DG/YE/DG	YE/AL	M					X	X				
1581-66270	DG/YE/DG	WH/AL	M					X	X	X	X	X	X
1581-66271	DB/RE/DB	YE/AL	F					X	X	X	X	X	X
1581-66272	OR/OR/OR	RE/AL	M					X					
1581-66273	WH/RE/WH	AL/WH	M						X	X	X	X	X
1581-66274	WH/RE/WH	AL/DB	M						X	X	X	X	X
1581-66275	OR/AL	DB/RE/DB	F						X				
1581-66276	DG/YE/DG	OR/AL	F						X	X	X	X	X
1581-66277	LB/WH/LB	YE/AL	F						X				
1581-66278	LB/WH/LB	OR/AL	F						X	X	X	X	X
1581-66279	YE/DB/YE	AL/RE	F						X	X	X	X	
1581-66280	YE/DB/YE	AL/YE	M						X	X	X	X	X
1581-66281	OR/OR/OR	YE/AL	F						X	X	X		
1581-66282	YE/DG/YE	DB/AL	F							X	X	X	
1581-66283	WH/AL	YE/DG/YE	F							X	X	X	

USGS Band	Left Leg	Right Leg	Sex	2002	2003	2004	2005	2006	2007	2008	2009	2010	2010
												Spr	Winter
1581-66284	DB/RE/DB	WH/AL	F							X	X	X	X
1581-66285	DB/RE/DB	DB/AL	M							X	X	X	X
1581-66286	DB/RE/DB	RE/AL	F							X			
1581-66287	LB/WH/LB	AL/PU	F							X	X	X	X
1581-66288	LB/WH/LB	AL/DG	M							X	X	X	X
1581-66289	YE/DB/YE	AL/WH	U										
1581-66290	YE/DB/YE	AL/PU	M							X	X	X	X
1581-66292	YE/DB/YE	AL/DG	F								X		
1581-66293	YE/DB/YE	AL/LB	F								X	X	X
1581-66294	YE/DB/YE	AL/DB	F								X	X	X
1581-66296	DG/AL	YE/YE/DG	M								X	X	X
1581-66297	AL/RE	YE/DG/YE	F								X	X	X
1581-66298	AL/DB	YE/DG/YE	F								X		
1581-66299	AL/YE	DB/RE/DB	F								X		X
1581-66300	AL/RE	LB/WH/LB	M								X		
1541-29901	AL/DB	LB/WH/LB	M								X	X	
1541-29902	AL/DB	WH/RE/WH	F								X	X	X
1541-29903	AL/YE	WH/RE/WH	M								X	X	X
1541-29904	AL/LB	WH/RE/WH	F								X		
1541-29906	AL/DG	DB/RE/DB	M								X	X	X
821-70901	OR/OR/OR	AL/DG	M								X	X	X
1541-29907	OR/OR/OR	AL/WH	F								X		X
821-70910	AL/YE	YE/LG/YE	F									X_j	X
821-70911	AL/WH	YE/LG/YE	M									X_j	
821-70912	AL/OR	YE/LG/YE	M									X_j	X
Unbanded			M									X_j	X
Unbanded			M									X_j	X?
Unbanded			F									X_j	X?
821-70913	AL/YE	LB/WH/LB	M									X_j	
821-70914	AL/LB	LB/WH/LB	M									X_j	X
821-70915	AL/LG	LB/WH/LB	F									X_j	
821-70916	AL/OR	LB/WH/LB	F									X_j	
821-70908	AL/OR	WH/RE/WH	M									X_j	X
Unbanded			F									X_j	
821-70904	AL/LB	YE/DB/YE	M									X_j	X
821-70907	AL/LG	YE/DB/YE	F									X_j	X
821-70906	AL/RE	YE/DB/YE	M									X_j	X
821-70902	OR/OR/OR	AL/YE	M									X_j	X
821-70903	OR/OR/OR	AL/LB	M									X_j	X
821-70916	YE/OR/YE	AL/DB	M									X_j	X
Continued -													

USGS Band	Left Leg	Right Leg	Sex	2002	2003	2004	2005	2006	2007	2008	2009	2010	2010
												Spr	Winter
Translocated Birds													
1751-83047	AL/LG	DB/DB/YE	M										
1681-89697	AL/LB	ST/ST/OR	F										
1681-89743	AL/DG	WH/WH/PU	F	X									
1751-42837	YE/DB/YE	WH/AL	M	X									
1751-42838	YE/DB/YE	LG/AL	M	X									
801-40249	BK/YE/DB	RE/AL	F	X	X	X	X	X	X	X			
1751-83163	AL/OR	DG/DG/OR	F	X									
1751-83133	AL/WH	ST/ST/OR	F	X									
1751-83208	AL/OR	WH/WH/MV	M	X									
1681-89800	AL/LG	PU/PU/LG	M	X									
1751-82968	AL/WH	OR/OR/DB	F	X									
1751-83201	AL/OR	WH/WH/LB	F	X									
1751-83213	AL/OR	OR/OR/LG	M	X									
1751-83142	AL/OR	DB/DB/WH	M	X	X	X	X	X	X	X	X	X	X
1751-83234	AL/YE	WH/WH/WH	F		X								
951-26443	AL/YE	DG/DG/LG	F		X								
951-26448	AL/YE	DG/DG/MV	M		X		X	X	X				
1751-83183	AL/OR	YE/YE/WH	M		X	X	X	X	X				
951-26305	AL/YE	YE/YE/WH	M		X	X	X	X	X	X	X	X	X
1581-66262	WH/WH/WH	AL/WH	M				X						
941-92246	AL / ST	OR/OR/YE	M										
1951-05035	AL / PU	WH/WH/MV	M				X						
1951-05086	AL/MV	MV/MV/WH	F				X	X	X	X	X		
941-92233	AL / ST	WH/WH/LG	F				X	X	X	X			
941-92268	AL / ST	PU/PU/WH	F				X						
Foreign or unknown birds													
Unknown	MV/LG	LG/AL	U				X						
1841-53714	RE/YE/RE	AL/OR	F						X	X			
1581-66291	WH/WH/WH	RE/AL	F							X	X	X	X

Table 2. Foraging group clusters for Red-cockaded Woodpeckers detected within Piney Grove Preserve during the 2010 winter survey. Clans at C-3, C-7, and C-8 are joined by one or more birds roosting from C4, C-9, and C-15, respectively.

Roost Cluster	USGS Band #	Left Leg	Right Leg	Sex	Age
C-1	1581-66296	DG/AL	YE/YE/DG	M	1
C-1	1581-66270	DG/YE/DG	WH/AL	M	4
C-1	1581-66283	WH/AL	YE/DG/YE	F	2
C-1	1581-66294	YE/YE/DB	AL/DB	F	1
C-1	1751-83142	AL/OR	DB/DB/WH	M	8
C-1	821-70910	AL/YE	YE/LG/YE	F	0
C-1	821-70912	AL/OR	YE/LG/YE	M	0
C-3	821-70901	OR/OR/OR	AL/DG	M	1
C-3	1581-66214	RE/DB	WH/AL	M	10
C-3	1581-66266	LB/WH/LB	RE/AL	F	4
C-3	1581-66285	DB/RE/DB	DB/Al	M	2
C-3	1581-66287	LB/WH/LB	AL/PU	F	2
C-3	Unbanded			M	0
C-3	Unbanded			U	0
C-3	1581-66299	AL/YE	DB/RE/DB	F	1
C-5	1581-66294	AL/DB	YE/DG/YE	F	1
C-5	1581-66220	WH/LB/WH	PU/AL	M	10
C-5	1581-66288	LB/WH/LB	AL/DG	M	2
C-5	1581-66257	LB/WH/LB	AL/RE	M	5
C-5	821-70914	AL/LB	LB/WH/LB	M	0
C-6	1581-66284	DB/RE/DB	WH/AL	F	2
C-6	1541-29906	AL/DG	DB/RE/DB	M	1
C-6	1541-29902	AL/DB	WH/RE/WH	F	1
C-7	1581-66271	DB/RE/DB	YE/AL	F	4
C-7	951-26305	AL/YE	YE/YE/WH	M	7
C-7	1541-29903	AL/YE	WH/RE/WH	M	1
C-7	821-70908	AL/OR	WH/RE/WH	M	0
C-8	1581-66280	YE/DB/YE	AL/YE	M	3
C-8	1581-66251	LB/WH/LB	AL/DB	M	6
C-8	1581-66278	LB/WH/LB	OR/AL	F	3
C-8 (C-15)	1581-66290	YE/DB/YE	AL/PU	M	2
C-8	821-70904	AL/LB	YE/DB/YE	M	0
C-8	821-70906	AL/RE	YE/DB/YE	M	0
C-8	821-70907	AL/LG	YE/DB/YE	F	0

Continued on next page

Table continued

Roost Cluster	USGS Band #	Left Leg	Right Leg	Sex	Age
C-10	1581-66276	DG/YE/DG	OR/AL	F	1
C-10	1541-29907	OR/OR/OR	AL/WH	F	1
C-10	1581-66273	WH/RE/WH	AL/WH	M	3
C-10	821-70902	OR/OR/OR	AL/YE	M	0
C-10	821-70903	OR/OR/OR	AL/LB	M	0
C-13	1581-66291	WH/WH/WH	RE/AL	F	1
C-13	1581-66274	WH/RE/WH	AL/DB	M	2
C-13	821-70917	OR/YE/OR	AL/DB	M	0

Cluster 8 – The breeding pair remained the same for the third 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 a new tree this season (#179) marking the second time over the last two years a new tree was chosen for breeding. Two eggs were first discovered on 19 April. On 10 May 4 nestlings were banded. All nestlings were 8-9 days of development. Only 3 of the 4 nestlings fledged and were identified as 2 males and 1 female on 1 June. Three helpers were identified as birds originally hatched at this site (YE/DB/YE, AL/YE; YE/DB/YE, AL/DB; and YE/DB/YE, AL/PU in 2007, 2008, and 2008, respectively). All three successful fledgling birds were detected during winter surveys.

Cluster 10 – The breeding pair has remained the same since 2008 (male: WH/RE/WH, AL/DG and female: DG/YE/DG, OR/AL). A new nest cavity was established and used this season (tree 156). The female was first noticed incubating on 13 April and 2 eggs were detected on 14 April. On 20 April a full clutch of 4 eggs were discovered. All 4 eggs hatched on 28 April however 2 nestlings did not survive until banding age. On 6 May 2 nestlings were banded and estimated to be 7-8 days old. Both nestlings successfully fledged and both were identified as males. Both of the successful fledglings were detected again during winter surveys.

Cluster 13 – This was the first year that a potential breeding pair occupied the site during the breeding season. The breeding male (WH/RE/WH, AL/DB) was hatched at C-7 in 2007 and 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. Incubation was first detected on 10 May in tree 126. Four eggs were detected that day. On 27 May one 8 day old chick and one dead chick were found in the nest. The dead chick had reached development state of 5 days after hatching. The one banded chick successfully fledged and was identified as a male. This male was detected at C-13 during the winter survey.

Table 3. Red-cockaded Woodpecker nestlings recorded during banding activities at the Piney Grove Preserve in 2010.

Cluster	Date	USGS	Left	Right	Age	Mass (g)	Sex
C-1	5/18/10	821 70910	AL/YE	YE/LG/YE	7	28.0	F
C-1	5/18/10	821 70911	AL/WH	YE/LG/YE	7-8	30.0	M
C-1	5/18/10	821 70912	AL/OR	YE/LG/YE	8	29.0	M
C-1	5/18/10	Not banded					*
C-3	5/10/10	Not banded					M
C-3	5/10/10	Not banded					M
C-3	5/10/10	Not banded					F
C-5	5/18/10	821 70913	AL/YE	LB/WH/LB	9	21.0	M
C-5	5/18/10	821 70914	AL/LB	LB/WH/LB	10	30.5	M
C-5	5/18/10	821 70915	AL/LG	LB/WH/LB	9	22.5	F
C-5	5/18/10	821 70916	AL/OR	LB/WH/LB	9-10	25.0	F
C-7	5/18/10	821 70908	AL/OR	WH/RE/WH	8-9	33.5	M
C-7	5/18/10	821 70909	AL/LG	WH/RE/WH	5-6	11.0	*
C-7	5/18/10	Not banded			9-10		F
C-8	5/10/10	821 70904	AL/LB	YE/DB/YE	8-9	33.5	M
C-8	5/10/10	821 70905	AL/OR	YE/DB/YE	9	33.0	*
C-8	5/10/10	821 70907	AL/LG	YE/DB/YE	8-9	35.5	F
C-8	5/10/10	821 70906	AL/RE	YE/DB/YE	9	35.0	M
C-10	5/6/10	821 70902	OR/OR/OR	AL/YE	8	30.0	M
C-10	5/6/10	821 70903	OR/OR/OR	AL/LB	7-8	30.5	M
C-13	5/27/10	821 70917	YE/OR/YE	AL/DB	8	30.0	M
C-13	5/27/10	Not banded	Dead in nest				*

*nestling did not fledge

Translocations

No translocations of birds into Piney Grove have been conducted since 2005.

Cavity Trees

In 2010, Piney Grove contained 159 cavities in live trees including 42 start cavities, 52 completed cavities, and 65 artificial inserts. Sixteen new cavities or new cavity starts were added to the number of known cavities this past year. Six trees died between 2009 and 2010 resulting in a loss of nine cavities or cavity starts. Six new trees were found with newly completed natural cavities and four cavity starts. Six artificial inserts were installed in new trees creating two new recruitment clusters, C17 and C18. One unrecorded relic cavity and three starts were discovered in previously tagged cavity trees.

Sixty of the 117 (51%) available natural cavities or inserts had fresh or recent chipping and sap flow from resin wells in the spring of 2010. Of the 65 inserts in live trees, 26 (40%) had fresh or recent resin work. Of the 52 natural cavities, 34 (65%) had fresh or recent resin work.

Cavity competitor inspection and removal

There were 37 instances of cavity competitors or nest material in RCW cavities during the April, May and June 2010. Multiple cavity competitor species occurring simultaneously in a cavity were counted as separate occurrences. Multiple individuals of one species found together in a cavity were counted as one occurrence. Southern flying squirrels accounted for 11 of the 37 occurrences. A total of 19 individual flying squirrels were removed on 11 occasions from eight of the 117 available cavity trees. Other species found include white-breasted nuthatch, tufted titmouse, great-crested flycatcher, unidentified snake species, and unidentified bee and wasp species.

Historic Sites

Historic sites were not visited this season since most have been degraded and no longer have the potential to support RCWs. Descriptions of each site are based on 2006 visits.

<u>Route 460 Site (Sussex County)</u>

Site Condition – This site remains intact but is severely degraded from midstory encroachment and limited size. Habitat on both sides of this tract has been harvested in the last 20 years leaving this island of mature timber too insignificant to consider for management purposes.

Cavity tree status – None detected.

Bird status – No evidence of activity present.

Route 35 Site (Southampton County)

Site Condition – The site was purchased by Ashton Lewis Lumber Company in late 2001 and harvested in winter 2002. Remaining timber on this tract is relegated to two small stands (less than 20 ha each) primarily in the 40 -60 year age class. Next nearest stand of mature timber is a small 15 ha block approx. 3 km away.
Cavity tree status – All were harvested or knocked down in the harvest.

Bird status – No recent evidence of birds.

Route 612 Site (Southampton County)

Site Condition – With the exception of 135 acres that surrounds the cluster area, this site was harvested in the summer of 2003 by Virginia-Carolina Properties. Harvest was carried out under agreement with the Virginia Department of Game & Inland Fisheries and the U.S. Fish and Wildlife Service. Under a Habitat Conservation Plan developed in cooperation with the U.S. Fish and Wildlife Service, the Virginia Department of Game & Inland Fisheries, The Nature Conservancy, and the Center for Conservation Biology, the lone, male Red-cockaded Woodpecker was moved to the Piney Grove Preserve and the remaining 135 acres were harvested in the late spring of 2005.

Rt. 40 Site (Sussex County)

Site Condition – The core site between Rt 40 and old Rt 40 is still intact, although hardwood encroachment and a dense pine subcanopy have all but removed access to any potential cavity trees. Ashton Lewis Lumber Company purchased this site from Gray Family Trust in 2002. They have since harvested all of the mature timber around this site, leaving only the historic triangle of old-growth timber still standing. This remaining tract is less than 25 ha and is too degraded to be of any use to red-cockaded woodpeckers. Ashton Lewis has received authority to harvest the remaining acreage as soon as the site dries out enough to get equipment in.

Cavity tree status – All historic cavity trees are dead or have been enlarged to the point of excluding red-cockaded as users.

Bird status – Last detection was a vocalizing bird to the southeast of the stand in spring, 1996.

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Appendix I. 2010 Red-cockaded Woodpecker status for Piney Grove Preserve.

Cluster	Tree	Species	Condition	Cavity	2010 Status	2010 Condition	2010 Entrance	2010 Plate	2010 Resin Work
1	31	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Fresh
1	32	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Fresh
1	34	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
1	35	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Recent
1	36	Loblolly	Live	Artificial	Relic	Insert	Normal	>15 cm	Old/None
1	37	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Recent
1	38	Shortleaf	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
1	39	Loblolly	Live	Natural	Inactive	Complete	<2X	> 45 cm	Old/None
1	40	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
1	41	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
1	42	Loblolly	Live	Natural	Relic	Start	Healing	Unavailable	Unavailable
1	43	Loblolly	Live	Natural	Relic	Complete	>4X	15-30 cm	Old/None
1	44a	Loblolly	Live	Natural	Relic	Complete	<2X	Unstarted	Old/None
1	44b	Loblolly	Live	Natural	Relic	Complete	>4X	15-30 cm	Old/None
1	45a	Loblolly	Dead	Natural	Active	Complete	Normal	30-45 cm	Fresh
1	45b	Loblolly	Dead	Natural	Inactive	Complete	>2X	30-45 cm	Old/None
1	46	Loblolly	Live	Natural	Relic	Complete	>2X	Unstarted	Old/None
1	47	Loblolly	Live	Natural	Relic	Start (Ad)	Restrictor	Unstarted	Old/None
1	48	Loblolly	Live	Natural	Active	Complete	Normal	> 45 cm	Fresh
1	49	Loblolly	Live	Natural	Relic	Complete	>4X	15-30 cm	Old/None
1	50	Shortleaf	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
1	51	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
1	52	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
1	53	Loblolly	Live	Natural	Active	Complete	Normal	30-45 cm	Fresh
1	54	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
1	55	Loblolly	Live	Natural	Active	Complete	<2X	Unstarted	Fresh
1	57	Loblolly	Live	Natural	Active	Complete	Normal	30-45 cm	Fresh
1	58a	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
1	58b	Loblolly	Live	Natural	Active	Complete	Normal	>15 cm	Fresh
1	59a	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
1	59b	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
1	102	Loblolly	Dead	Natural	Relic	Complete	>2X	>15 cm	Old/None
1	117	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
1	164	Loblolly	Live	Natural	Active	Complete	Normal	30-45 cm	Fresh
2	60	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
2	61	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable

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Cluster	Tree	Species	Condition	Cavity	2010 Status	2010 Condition	2010 Entrance	2010 Plate	2010 Resin Work
2	62	Loblolly	Dead	Artificial	Relic	Insert	Normal	Unavailable	Unavailable
2	63	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
3	1	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
3	2	Loblolly	Live	Artificial	Inactive	Insert	Restrictor	>15 cm	Old/None
3	3a	Loblolly	Live	Natural	Active	Complete	Restrictor	> 45 cm	Fresh
3	3b	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
3	4a	Loblolly	Live	Natural	Active	Start (Ad)	<2X	Unstarted	Old/None
3	4b	Loblolly	Live	Natural	Active	Complete	Restrictor	30-45 cm	Fresh
3	5	Loblolly	Live	Natural	Relic	Start	Normal	Unstarted	Old/None
3	6	Loblolly	Live	Natural	Inactive	Complete	Normal	Unstarted	Old/None
3	7a	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Recent
3	7b	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Recent
3	8	Loblolly	Live	Natural	Active	Complete	<2X	15-30 cm	Fresh
3	9a	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
3	9b	Loblolly	Live	Natural	Active	Complete	Normal	30-45 cm	Fresh
3	9c	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
3	71	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
3	72	Loblolly	Live	Natural	Relic	Complete	>4X	>15 cm	Old/None
3	74	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
3	75	Loblolly	Live	Natural	Relic	Complete	>2X	Unstarted	Old/None
3	76	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old/None
3	77	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
3	79a	Loblolly	Live	Natural	Relic	Complete	>2X	30-45 cm	Old/None
3	79b	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Recent
3	79c	Loblolly	Live	Natural	Inactive	Start	Restrictor	Unstarted	Old/None
3	80	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Fresh
3	177	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old/None
3	178	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Fresh
3	179	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
3	180	Loblolly	Live	Natural	Relic	Start	Normal	Unstarted	Old/None
4	81	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
4	82	Loblolly	Live	Artificial	Active	Insert	Normal	>15 cm	Fresh
4	83	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
4	84	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
4	186	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
5	18a	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
5	18b	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
5	19	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
5	20	Loblolly	Live	Natural	Relic	Complete	Restrictor	> 45 cm	Old/None
5	21	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	22	Loblolly	Live	Natural	Relic	Complete	Restrictor	> 45 cm	Old/None

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Cluster	Tree	Species	Condition	Cavity	2010 Status	2010 Condition	2010 Entrance	2010 Plate	2010 Resin Work
5	23a	Loblolly	Live	Natural	Active	Complete	Restrictor	>15 cm	Fresh
5	23b	Loblolly	Live	Natural	Active	Complete	Restrictor	> 45 cm	Fresh
5	24	Loblolly	Live	Natural	Active	Complete	Restrictor	30-45 cm	Recent
5	25	Loblolly	Live	Natural	Active	Complete	<2X	> 45 cm	Fresh
5	26	Loblolly	Live	Natural	Active	Complete	Restrictor	15-30 cm	Fresh
5	27	Loblolly	Live	Natural	Active	Complete	Restrictor	15-30 cm	Fresh
5	28	Loblolly	Live	Natural	Inactive	Complete	Restrictor	>15 cm	Old/None
5	29	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	30	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Fresh
5	92	Loblolly	Live	Natural	Relic	Start	Healing	Unavailable	Unavailable
5	93	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	94	Loblolly	Live	Natural	Relic	Complete	Restrictor	Unstarted	Old/None
5	95	Loblolly	Live	Natural	Relic	Complete	Restrictor	15-30 cm	Old/None
5	96	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	97	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	98	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	99	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	127	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
5	138	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
5	191	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
6	10	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old/None
6	11	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
6	12	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
6	13	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
6	116	Loblolly	Live	Artificial	Active	Insert	Normal	>15 cm	Fresh
6	135a	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
6	135b	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
6	135c	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
6	136a	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
6	136b	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Fresh
6	137	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
6	139	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
7	105	Loblolly	Live	Artificial	Active	Insert	Normal	15-30 cm	Fresh
7	106a	Loblolly	Live	Natural	Active	Complete	<2X	15-30 cm	Fresh
7	106b	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Recent
7	107	Loblolly	Live	Natural	Active	Complete	<2X	30-45 cm	Fresh
7	108	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
7	109	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Fresh
7	110	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old/None
7	111	Loblolly	Live	Artificial	Poss. Active	Insert	Normal	>15 cm	Recent

Appendix I contd.

Cluster	Tree	Species	Condition	Cavity	2010 Status	2010 Condition	2010 Entrance	2010 Plate	2010 Resin Work
7	112	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
7	113	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
7	114	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
7	115	Loblolly	Live	Natural	Inactive	Complete	<2X	30-45 cm	Old/None
7	190	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
7	192a	Loblolly	Live	Natural	Inactive	Sub-start	Normal	Unstarted	Old/None
7	192b	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
7	194a	Loblolly	Dead	Natural	Inactive	Sub-start	Normal	Unstarted	Fresh
7	194b	Loblolly	Dead	Natural	Active	Complete	Normal	30-45 cm	Fresh
7	195	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old/None
8	129	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
8	155	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
8	170	Loblolly	Live	Artificial	Active	Insert	Normal	15-30 cm	Fresh
8	171	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
8	172	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
8	173	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
8	174a	Loblolly	Live	Natural	Active	Complete	Restrictor	Unstarted	Recent
8	174b	Loblolly	Live	Natural	Inactive	Start	<2X	Unstarted	Old/None
8	174c	Loblolly	Live	Natural	Inactive	Start	<2X	Unstarted	Old/None
8	175	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
8	176a	Loblolly	Live	Natural	Inactive	Start (Ad)	<2X	Unstarted	Old/None
8	176b	Loblolly	Live	Natural	Inactive	Complete	>4X	Unstarted	Old/None
8	176c	Loblolly	Live	Natural	Inactive	Start	<2X	Unstarted	Old/None
8	176d	Loblolly	Live	Natural	Inactive	Complete	>2X	Unstarted	Old/None
8	176e	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
8	176f	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old/None
8	NT	Unknown	Live	Natural	Active	Start	Normal	Unstarted	Fresh
9	85	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
9	86	Loblolly	Live	Artificial	Poss. Active	Insert	Normal	Unstarted	Recent
9	87	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Recent
9	88	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
10	64	Loblolly	Live	Artificial	Active	Insert	Normal	>15 cm	Fresh
10	65	Loblolly	Live	Artificial	Active	Insert	Normal	30-45 cm	Fresh
10	66	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
10	67	Loblolly	Live	Natural	Inactive	Complete	>4X	Unstarted	Recent
10	68	Loblolly	Live	Natural	Active	Complete	<2X	Unstarted	Fresh
10	150	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
10	151	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
10	152	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
10	153	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable

Appendix I contd.

Cluster	Tree	Species	Condition	Cavity	2010 Status	2010 Condition	2010 Entrance	2010 Plate	2010 Resin Work
10	154	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Recent
10	156	Loblolly	Live	Natural	Active	Complete	Normal	15-30 cm	Fresh
11	140	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
11	141	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
11	142	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
11	143	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
12	130	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
12	131	Loblolly	Live	Artificial	Poss. Active	Insert	<2X	Unstarted	Recent
12	132	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
12	133	Loblolly	Live	Artificial	Poss. Active	Insert	Normal	Unstarted	Recent
12	189	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
13	118	Loblolly	Live	Artificial	Active	Insert	Normal	>15 cm	Fresh
13	119	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
13	120	Loblolly	Live	Artificial	Poss. Active	Insert	Normal	Unstarted	Recent
13	121	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
13	122	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
13	123	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
13	124	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old/None
13	126	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
14	88	Loblolly	Live	Natural	Inactive	Start (Ad)	Normal	Unstarted	Old/None
14	89	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
14	90	Loblolly	Dead	Artificial	Poss. Active	Insert	Normal	Unstarted	Old/None
14	91	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
14	100	Loblolly	Live	Natural	Inactive	Start (Ad)	<2X	Unstarted	Old/None
14	101	Loblolly	Live	Natural	Active	Complete	<2X	Unstarted	Fresh
15	160	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
15	161	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
15	162	Loblolly	Live	Artificial	Active	Insert	Normal	15-30 cm	Recent
15	163	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
16	165	Loblolly	Live	Natural	Active	Start	<2X	Unstarted	Fresh
16	166	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
16	167	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
17	146	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
17	147	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
18	181	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
18	182	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
18	183	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None
18	184	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old/None