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Cooperative Red-Cockaded Woodpecker Translocation Strategy Throughout the Southeast

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COOPERATIVE RED-COCKADED WOODPECKER TRANSLOCATION STRATEGY THROUGHOUT THE SOUTHEAST

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FINAL REPORT

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The University of Georgia

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Collaborators:

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Project Period: April 2008 – August 2010 **Project Budget:** $101,050

Period Covered by Progress Report: April 2008 – August 2010

Project Objectives:

1. Monitor 100 Red-cockaded Woodpecker (RCW) groups during the nesting season (April-June).
2. Band all nestlings of the 100 groups producing nestlings (May-July).
3. Conduct roost cavity checks for all subadults fledgling from 100 groups (June-September).
4. Trap and translocate at least 20 subadult RCWs from the pool of 100 groups monitored (October-December).

Introduction:

Funding for this project, provided by the Department of Defense Legacy Resource Management Program (Legacy), was used to subcontract with a translocation biologist during 2008 – 2010 to work at the Francis Marion National Forest (FMNF), so as to provide additional Red-cockaded Woodpeckers (RCW; *Picoides borealis*) for translocation across the southeastern U.S. Translocations have been part of the recovery effort for the federally endangered RCW since the late 1980s (Costa and Kennedy 1994, Hess and Costa 1995). This management tool involves moving RCWs, typically subadult birds, to new locations within or

between populations for the purpose of augmenting a single bird group or establishing a new group. Inter-population translocations (hereafter "translocations") are conducted between donor populations and recipient populations using criteria presented in the RCW Recovery Plan: *Second Revision* (Recovery Plan) (U.S. Fish and Wildlife Service 2003).

According to the Recovery Plan, populations qualify as donors when they satisfy one or more of the following criteria: (1) populations that have reached the size for delisting and are growing or stable, (2) stable or increasing populations of 100+ active clusters, (3) populations of 50+ active clusters growing at 3% annually and within 75% of their population goal, or (4) populations that have met their property goals. Recipient populations must have a population goal of at least 10 active clusters, have fewer than 30 potential breeding groups (PBGs), and satisfy specific habitat criteria. The importance of translocations in saving small, fragmented, and at-risk populations from extirpation has been clearly demonstrated (Rudolph et al. 1992, Haig et al. 1993, Brown and Simpkins 2004, Hedman et al. 2004, Morris and Werner 2004, Stober and Jack 2004) as well as its effectiveness in reintroducing RCWs into new habitats within its historic range (Hagan and Costa 2001, Hagan et al. 2004). However, the demand for birds from recipient populations has remained higher than the supply from donor populations (Saenz et al. 2002, Costa and DeLotelle 2006).

In 1998, the Southern Range Translocation Cooperative (SRTC) was created to coordinate the distribution of the limited number of RCWs available for translocation in the southeastern portion of the species' range. An annual SRTC meeting in Tallahassee, Florida, allocates available RCWs in a modified version of the alternating model described by Saenz et al. (2002). Birds are translocated in groups of 3-5 unrelated, subadult pairs to recipient properties on an alternate year schedule. Although this system may not be the most efficient model for attaining the largest number of RCW groups over the least amount of time, it is one of the better models for balancing population recovery with the prevention of local extirpation (Saenz at al. 2002). This system also allows land managers a predictable schedule in which to prepare recruitment clusters and foraging habitat for anticipated birds.

The SRTC originally consisted of RCW populations from Florida, Georgia, Alabama, and Mississippi. In 2008, with support from the Southeast Regional Partnership for Planning and Sustainability (SERPPAS), the SRTC expanded to include North Carolina and South Carolina. The original SERPPAS translocation partnership was formed with the Department of Defense (DoD), U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), Clemson University (CU), University of Georgia Athens (UGA), and state agencies and organizations from Florida, Georgia, Alabama, North Carolina and South Carolina (Table 1). The goal of the SERPPAS translocation biologist positions is to speed up recovery efforts at recipient properties by providing additional RCWs to the SRTC and ultimately bring the RCW closer to delisting. Along with the regional expansion of SRTC, 3 translocation biologist positions have been established. This project dealt with one of the SRTC donor sites—the FMNF in Charleston and Berkeley counties, South Carolina.

Table 1. Partners in the 2008 - 2010 SERPPAS red-cockaded woodpecker translocation project.

Agencies
Federal
Department of Defense[1]
U.S. Army[1, 2]
Eglin Air Force Base[2]
U.S. Forest Service
U.S. Fish and Wildlife Service
State
South Carolina Department of Natural Resources
Florida Fish and Wildlife Conservation Commission[1]
Georgia Department of Natural Resources[1]
Alabama Department of Conservation and Natural Resources[1]
North Carolina Wildlife Resources Commission
University of Georgia
Clemson University

[1] Provided biologist funding
[2] Became involved in 2010

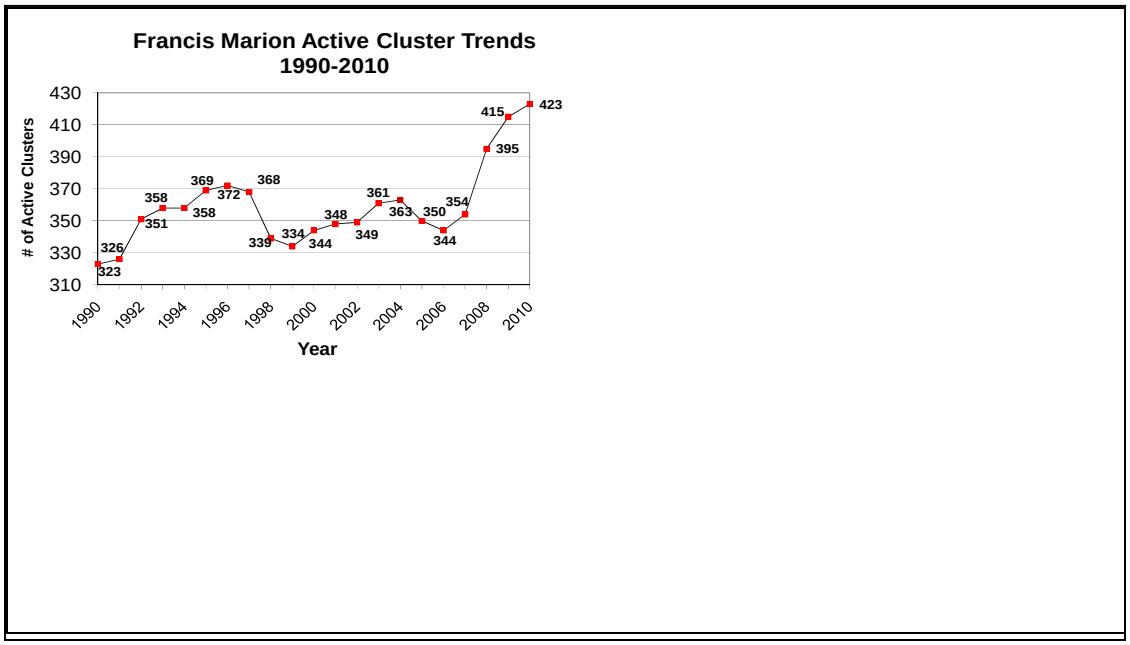
Francis Marion National Forest (FMNF):

The FMNF is located in the Mid-Atlantic Coastal Plain RCW Recovery Unit (N33 7', W79 41'). This 104,813-ha (259,000-ac) property is managed by the U.S. Forest Service (USFS), with 65,508 ha (161,875 ac) currently under RCW management. The forest supports the third largest RCW population in the United States and is one of 13 designated primary core recovery populations (USFWS 2003). Prior to 1989, the RCW population exceeded 475 groups and was expanding. During the 1970's and 80's, the FMNF supported the second largest and only documented naturally increasing population of RCWs (Hooper et al. 1991). However, when Hurricane Hugo made landfall on the South Carolina coast in 1989, approximately 63% of the population was lost. The hurricane destroyed 87% of the cavity trees and 59% of the foraging habitat across the forest. Approximately 59% of pine trees $\geq$25 cm (10 in) diameter at breast height were destroyed by Hurricane Hugo (Hooper et al. 1990, Watson et al. 1995).

Due to aggressive habitat management, more frequent prescribed fires and installation of more than 2,700 artificial cavities, the RCW population on FMNF has rebounded dramatically and, in 2008, surpassed its recovery goal of 350 PBGs. The population goal is to maintain 450 active clusters; currently there are 423 active clusters.

A third of all clusters on the FMNF are monitored annually as part of a separate forest-wide project. Based on this annual monitoring data, the RCW population has shown a marked increase since 2006 (Figure 1). As of January 2011, there were approximately 411 PBGs, 12 solitary groups and 61 inactive clusters on the FMNF.

Figure 1. Population trend (number of active red-cockaded woodpecker clusters) on the Francis Marion National Forest from 1990-2010.



Although systematic surveying of suitable habitat is not possible at this time, pioneer clusters are regularly located by timber cruisers, the fire crew or biologists during the course of their normal field activities. The rate of increase has slowed but the increase is expected to continue as habitat management practices are consistently implemented. Artificial recruitment clusters are routinely installed where possible. However, the limitation for recruitment cluster establishment is locating large enough cavity trees within suitable habitat to fill gaps in the landscape unoccupied by RCWs.

Prescribed burning is likely the single most important silvicultural treatment utilized on the FMNF. Since 1997, the FMNF has burned approximately 12,995 ha (32,000 ac) annually with 13,682 ha (33,795 ac) burned in 2010 alone. Since Hurricane Hugo, most timber harvesting has consisted of biomass removal and small timber thinning. The FMNF typically masticates approximately 150 acres of biomass and selectively thins approximately 1,215-1,619 ha (3-4,000 ac) annually in order to improve habitat for the RCW and other threatened and endangered species. However, during 2010, approximately 263 ha (650 ac) were masticated on the FMNF, significantly improving RCW habitat.

Methods:

Monitoring for RCW breeding in pre-selected groups began each year in mid-April on the FMNF. Active clusters were visited weekly to inspect cavity trees for evidence of a nest or nest preparation. Active cavities were determined by fresh chipping on the bark of the tree and recent resin flow (Hooper et al. 1980). Evidence of nesting included fresh wood chips lining the bottom of the cavity or the presence of eggs or nestlings. Nest searching was conducted using a Cavity Spy video inspection system (designed and manufactured by Wildlife Investigations, LLC). This pole-mounted, video camera system allowed remote visual examination of the interior of the cavity to examine nest cavity contents.

When a nest was located, it was visited weekly to determine clutch size and age of chicks. Banding was scheduled when chicks were 7-10 days old. Swedish climbing ladders were used to access the nest cavity and chicks were extracted using a noose made of pliable tubing fitted with monofilament loops (Jackson 1982). Chicks were banded with a U.S. Geological Survey aluminum band and a unique color band combination (5 bands; 2 on one leg w/USGS band, 3 on the other leg) to allow later identification with a spotting scope. Nests were revisited when chicks were approximately 21 days old to determine sex of nestlings (pre-fledge checks) using the video cameras.

Of the more than 400 clusters on the FMNF, the SERPPAS translocation biologist attempted to routinely monitor the same 102 clusters annually for the purpose of translocation. These clusters were selected based on several factors including previous years' breeding results, ease of access, number of suitable cavities, past breeding history, group size, and spatial location within the forest. The clusters chosen were distributed evenly across the forest so that all quadrants of the forest contained numerous clusters to monitor. As the breeding season progressed, clusters that had a nest depredated or did not nest by approximately mid-May were dropped from monitoring while other clusters were added (from a different forest-wide cluster monitoring project) to ensure that a minimum of 100 RCW nests had their nestlings banded.

RCW groups were followed post-fledging to obtain data on the number of chicks successfully fledged, the sex of individual fledglings and group composition. Selected groups were revisited during dawn and/or dusk to determine the roosting cavity of subadult RCWs. All female subadults found roosting in their natal territory were considered suitable candidates for translocation. Since male RCWs may remain in their natal territories as helpers and increase fledgling success (Lennartz et al. 1987, Walters 1990), subadult males were not translocated from their cluster unless at least one additional non-breeding male was present, in addition to the breeding male.

Translocations were conducted each year during the fall within the recommended window of September 15-January 1 (USFWS 2003). In most cases, staff and equipment from recipient populations arrived several days in advance of the capture to assist with the translocations. The SERPPAS translocation biologist supplied information on forest orientation, roosting locations of candidate subadults, RCW cluster maps, RCW group composition, and additional equipment and volunteers. All captures were conducted during evening roosting. After a targeted RCW entered its roost cavity, a net on a pole was placed over the cavity entrance. Once the bird flushed into the net it was removed and placed in a transport box. The birds

were transported at night and secured in recipient cavities on the evening of their capture. However, birds travelling an extended distance by vehicle were transported the day after capture, hand-fed during the daytime and placed in recipient cavities approximately 24 hours after their capture. All birds were released at sunrise the morning following their placement.

Translocation Results:

2008:

Of the initial 126 clusters monitored during 2008, 16 clusters were removed from monitoring due to late nesting and 6 clusters had eggs that never hatched and were not monitored past the normal hatch date. One cluster was omitted because the nest tree was too dangerous to climb (steep lean with most of the tree base burnt).

A total of 245 nestlings were banded in 103 nests from 102 groups (1 re-nest) that produced nestlings reaching banding age. Four nests failed after the nestlings had been banded. One of these clusters was again monitored and a single nestling was banded in the subsequent nesting attempt. In the 102 clusters, 249 nestlings reached banding age. Only 245 nestlings were banded because several nests had birds too small to be banded (due to age and size differences in larger clutches) or had nestlings that were extremely difficult to noose without excessive harassment. Of all nestlings, 240 reached 21 days old and these were assumed to have fledged. For groups that fledged young, an average of 2.4 nestlings fledged/nest (N=99). Males constituted 45.8% (N=110) of the fledglings, females were 49.6% (N=119) and unknown sex were 4.6% (N=11).

During pre-fledge checks, 36 nests had either a lone nestling of known sex or all nestlings were the same sex. These clusters were not re-visited for post-fledge checks. The remaining 66 clusters were visited to assign a sex to the band combination of the banded birds. However, to ease the task of sexing the birds, juveniles were re-sighted until all fledglings could be assigned a sex. For example, if a nest at pre-fledge had 2 males and 1 female, re-sighting was done until the female was located and bands were observed or both males had been re-sighted and the band combinations were determined. Once all birds could be assigned a sex based on bands, re-sighting was discontinued for that group.

Translocation clusters were not randomly chosen and most RCW clusters had high numbers of suitable cavities and large group sizes. One group had only 2 adult RCWs, one group had 7 adult RCWs, one group had 6 adults, and most had 4-5 adults (group size was not recorded for all clusters).

During the fall translocation, 1-3 clusters were re-visited each morning and evening from September 13 through November 10, 2008. During this period 65 banded fledglings were re-sighted in the 68 total clusters visited. Of these 65 fledglings, 48 were found to have a roost cavity (5 of the 48 roosted in artificial inserts recently installed).

For the 2008 translocation work, 10 male and 10 female subadult RCWs were removed from the FMNF. The Military Ocean Terminal at Sunny Point (Brunswick County, NC) received 3 pairs of RCWs on October 7. Fort Jackson (Richland County, SC) received 4 pairs on October 22 and Okefenokee National Wildlife Refuge (Charlton/Ware/Clinch counties, GA) received 3 pairs on November 10. All recipient biologists reported successful transport and release of all birds.

2009:

A total of 218 RCW nestlings in the FMNF were banded in 92 nesting attempts from 102 groups that were monitored during 2009. Of these 102 groups, 14 nests failed. The nestlings of 10 re-nests were successfully banded while 4 clusters had nests that failed during the second attempt. Of all nestlings, 209 reached 21 days old and these were assumed to have fledged. For groups that fledged young, an average of 2.3 nestlings fledged/nest (n=92). Males constituted 45.0% (n=94) of the fledglings, females 48.8% (n=102) and unknown sex were 6.2% (n=13).

During pre-fledge checks, 39 nests had either a lone nestling of known sex or all nestlings were the same sex. These clusters were not re-visited for post-fledge checks. The remaining clusters were re-visited post-fledging to assign a sex to the band combination of the banded birds.

During the fall translocation, 1-3 clusters were re-visited most mornings and evenings from September through November. During this period 67 banded fledglings were re-sighted in 77 clusters. Of these 67 fledglings, 53 were found to have a roost cavity and were listed as potential candidates for translocation.

For the 2009 translocation work, 14 male and 15 female subadult RCWs were removed from the FMNF. Ocala National Forest (Marion County, FL) received 4 pairs of RCWs on October 20. The Joseph W. Jones Ecological Research Center (Baker County, GA) received 5 pairs on October 29 and Talladega National Forest, Talladega Ranger District (Talladega and Clay Counties, AL) received 5 pairs and an additional female (11 RCWs total) on November 13. All recipient biologists reported successful transport and release of all birds.

2010:

Following a severe winter, the translocation clusters had slightly smaller group and brood sizes, with a higher percentage of females fledging than in previous years (see below; 57% vs. 52% in 2009). During 2009 only one of the translocation clusters did not have at least one helper but in 2010 at least 7 clusters did not have a helper. Several groups initiated nests earlier than in previous seasons with the earliest banding dates being 3-4 days earlier than in the past years. Also, the peak banding dates were not as clearly defined as in previous breeding seasons with the daily number of nests scheduled to band being spaced more evenly throughout May rather than most banding taking place the third week of May.

A total of 186 RCW nestlings were banded in 101 nesting attempts from 102 groups that were monitored during 2010. Within these 102 RCW groups, 7 initial nest attempts failed, 9 groups did not attempt a nest and 5 groups had clutches that did not hatch. The nestlings of 3 re-nests were successfully banded while 4 groups had nests that failed during the second attempt. Of all nestlings, 184 reached 21 days old and these were assumed to have fledged. For groups that fledged young, an average of 2.1 nestlings fledged/nest (n=88). For fledglings that were able to be sexed, 57.1 % were females (n=101) and 42.9% (n=76) were males). During pre-fledge nest checks, 32 nests had either a lone nestling of known sex or all nestlings were the same sex. These clusters were not re-visited for post-fledge checks. The remaining clusters were re-visited post-fledging to assign a sex to the band combination of the banded birds.

During the fall translocation, 1-3 clusters were re-visited most mornings and evenings from September through October. During this period 52 banded fledglings were re-sighted in 49 clusters. Of these 52 fledglings, 37 were found to have a roost cavity and were listed as potential candidates for translocation.

For the 2010 translocation season, 10 male and 10 female subadult RCWs were removed from the FMNF. Fort Jackson (Richland County, SC) received 4 pairs on October 6 and 2 pairs on October 21. The USDA Forest Service (Aiken/Barnwell/Allendale counties, SC) received 2 pairs on the U.S. Department of Energy-Savannah River Site on October 21. On the final move for 2010, the U.S. Air Force's Poinsett Electronic Combat Range (Sumter County, SC) received 2 pair on November 1. Recipient biologists reported successful releases of all 24 RCWs.

Discussion:

SRTC Contribution and Translocation Success:

This project provided 69 additional RCW subadults as a contribution to the allocation available to SRTC during 2008 – 2010. These additional birds for SRTC recipient properties helped alleviate the supply shortage and even created the opportunity for new populations in SRTC to receive birds. The influx of donor birds also allowed recipient properties that were not slated to receive birds to be allocated pairs while still remaining on the proposed list of recipients for the next year. These recipient populations that were able to receive birds during "off" years especially benefit from the SERPPAS donors since the accelerated rate of augmentation should bring them to 30 PBGs (and off the recipient list) ahead of schedule.

The typical success rate of translocated RCWs varies depending on how "success" is defined, the type of translocation, and age of birds moved (Costa and Kennedy 1994, Franzreb 1999, Edwards and Costa 2004). Costa and Kennedy (1994) summarized 143 RCW translocations and reported a 50% overall success rate (n=71) using a wide range of terms for success (from translocated birds fledging offspring to remaining on site). The criterion for success most commonly used by the SRTC is the presence of the translocated bird on the property through the first breeding season after its release as either a breeder or potential breeder, solitary male or a helper (McDearman 2011). A recent report by McDearman (2011) summarizing SRTC

RCW translocations from 2007-2009, including birds moved by SERPPAS biologists in 2008 and 2009, showed an average success rate of 59% (n=49). Data on translocation success for birds from FMNF are not yet available for the translocation work conducted during 2010. However, the translocations from FMNF that were conducted during 2008 and 2009 have been successful. The FMNF translocated 49 RCWs during 2008 and 2009. Of the 20 birds translocated in 2008, 60% were successful, which exceeded the regional (SRTC) success rate of 53% for 2008 (McDearman 2011). In 2009, the FMNF birds experienced a lower-than-average success rate of 46%; the STRC average success rate for 2009 was 51% (McDearman 2011). Yearly variation is normal and both years were within reasonable range of the SRTC overall average.

Translocation Challenges and Opportunities:

The dynamics of donor populations themselves present individual challenges and benefits. It is beneficial for the SERPPAS translocation biologist to monitor the same groups each year. This allows the biologist to develop a history of behavioral characteristics associated with each group, which increases the biologist's success in future years. The FMNF population is a large, stable and recovered population that continues to exhibit growth. Within the entire forest of over 423 active clusters and 411 PBGs, the SERPPAS translocation biologist was able to hand-pick a subset of RCW groups most suited to produce fledglings for translocation (i.e., PBGs with large group size). The addition of recruitment clusters and the discovery of pioneer clusters continue to increase the number of clusters available each year to the SERPPAS translocation biologist on the FMNF. Therefore, the biologist may alter the monitoring sample at will when necessary.

Group size impacts the availability of birds for translocation and can be an indicator of population growth rate and density. The demographics of the preselected RCW groups on the FMNF show notably larger group size and greater reproductive success on average than some other donor populations (McDearman 2011).

Another key difference is evident when comparing the geographic locations of the 3 new donor populations, with the FMNF being at somewhat of a geographic disadvantage. Location affects which properties the new donors can ideally contribute to within the STRC. FMNF is part of the Mid-Atlantic Coastal Plain Recovery Unit, and the USFWS discourages translocation of RCWs between non-adjacent recovery units (USFWS 2003). The reasons for this policy are to: (1) maintain genetic integrity of the species, (2) support local adaptations of translocated birds, (3) minimize stress on birds, i.e., translocation time, (4) minimize logistical challenges, (5) minimize costs, and 6) preserve progress within recovery units. A review of RCW translocation success rates by Edwards and Costa (2004) has questioned the importance of keeping birds in the same or similar physiographic province (i.e., recovery unit); however, they still endorsed the current USFWS guidelines. Therefore, the populations that could receive birds from these forests are potentially limited by the recovery unit to which they belong.

The issues presented by the FMNF's location are being met by the addition of new recipient properties. Fort Jackson in South Carolina and the Army's Military Ocean Terminal at Sunny

Point in North Carolina, both first time recipients in the SRTC in 2008, were able to receive birds from the FMNF during its first year as a donor. However, in 2009, none of the recipient populations were within an adjacent recovery unit to the FMNF due, in part, to the bi-annual rotation of recipient properties. Therefore, birds were transported via the USFS airplane to recipient populations – a costly undertaking that potentially puts the birds under greater stress. In 2010, Fort Jackson was back in rotation to receive donated pairs and the Poinsett Electronic Combat Range in South Carolina also received birds from the FMNF. The long-term hope is that more recipient properties within the expanded region of the SRTC (i.e., South Carolina and North Carolina) will begin to participate in the cooperative in response to birds available from the FMNF in the future**.**

*Revisiting Targets and Annual Goals**:***

The 2010 RCW breeding season was a good season weather-wise and, consequently, reproduction-wise across the Southeast. This is in direct contrast to the challenging year faced by many of the populations in the South Central Florida Recovery Unit in 2009 that experienced a decline in reproductive success, which was thought to result from unprecedented amounts of rainfall (McDearman 2011). Although the FMNF RCW donor population is stable and growing, it can be affected by unforeseen stochastic events, as seen by the damage caused by Hurricane Hugo in 1989**.** This variation in reproductive success illustrates just how strongly factors such as weather conditions potentially influence the success of this project year to year. However, the overall positive and stable trends support the ability of reaching the target SERPPAS contributions promised to SRTC.

The SERPPAS translocation biologist working at the FMNF noted slightly smaller brood sizes during 2010 than in 2008 and 2009. These irregularities in nesting may be attributable to severe winter conditions experienced in that region in 2009. Breeding and helper adults may have died, causing a higher turnover in pair formation for breeding groups. In addition, severe winter conditions may have intensified inter- and intra-specific cavity competition, disrupting RCW nesting behaviors in some clusters. However, because most adults in this population are not color banded and only active cavities are examined, this competition theory is speculation. Despite the seemingly harsh winter, the FMNF RCW donor population continues to thrive and the SERPPAS translocation biologist was able to contribute the promised 10 pair of birds to SRTC during 2010. However, as of the date of this report, there is a lack of funding for this position and FMNF will not have birds to offer to the SRTC during 2011.

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