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ANNUAL REPORT

Fiscal Year 1992

Interagency Agreement DE-AI09-85SR14069

ESTABLISHMENT OF A VIABLE POPULATION OF
RED-COCKADED WOODPECKERS AT THE SAVANNAH RIVER SITE

Department of Energy, Savannah River Site

Department of Agriculture, Forest Service

Southeastern Forest Experiment Station, Clemson, SC

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Prepared by:

Kevin S. Laves

September 11, 1992

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INTRODUCTION

The Southeastern Forest Experiment Station (SEFES) began research on the red-cockaded woodpecker (RCW) on the Savannah River Site (SRS) in 1985 with the objective of restoring a viable population. This project is conducted in cooperation with the Department of Energy, the Savannah River Forest Station (SRFS) and the Savannah River Ecology Laboratory.

The program has consisted of two phases. The stabilization phase (1985-1987) focused on preventing the immediate extirpation of the RCW population. During this phase the number of breeding pairs of RCWs increased from one to three, and the total population increased from five to 14 birds. We are currently in the expansion phase (1987-present).

To facilitate the population expansion of the RCW at SRS, SEFES and SRFS have implemented numerous research and management activities. These include: control of mid-story vegetation to improve habitat suitability, installation of artificial cavities for RCWs, translocations of RCWs within the SRS and from other populations, maintenance of cavities by installing metal restrictors to discourage cavity competition, and genetic research to ascertain the degree of relatedness between individuals and populations. Nest boxes for flying squirrels have been used to reduce interspecific competition with RCWs for cavities. Additional research and management activities include monitoring flying squirrels encountered during routine monitoring operations. For the purpose of clarity a unit of one or more RCWs is referred to as a group and a collection of cavity trees a cluster.

ACCOMPLISHMENTS FY-1992

Habitat Improvements

Minimizing the amount of vegetation present in the mid-story of a cluster is essential as RCWs will abandon cavities if the mid-story is allowed to grow unchecked. SRFS burned 104 acres in RCW clusters this year to reduce the amount of vegetation in the mid-story. Another 336 acres were treated with herbicide. Mid-story thinning was conducted on 365 acres. In all 798 acres were subjected to various measures to improve habitat quality. SRFS plans substantial habitat improvement for the future using these techniques.

Translocations

A primary focus of SEFES research has been to promote population expansion on the SRS. In addition to creating artificial nesting cavities, translocation of birds from other populations into SRS has proved to be a tremendously effective method in promoting population growth. In fact, of the 38 individuals comprising the current population on SRS, 35 were translocated to the SRS or descended from relocated birds. Results of our translocation efforts on the SRS are summarized in a manuscript by D. Allen, K. Franzreb, and R. Escano (in press,

Wildlife Society Bulletin).

We translocated two RCWs to SRS from the Apalachicola National Forest in Florida in FY 1992. After the 1991 breeding season SRS had two bachelor males residing in two separate clusters. In October, 1991 we moved two juvenile females to these solitary males. The first

female was accepted by the male in cluster 6-43 and successfully produced 3 fledglings in 1992.

This pair continues to reside in cluster 6-43. The second juvenile female from Florida was moved to the solitary male in cluster 28. After her release, she was not observed for several weeks.

When next observed, she was 2 miles from cluster 28 in cluster 24-1 where she had displaced a juvenile female that evidently had been paired with cluster 24-1's resident male. The new pair attempted to nest, but their eggs failed to hatch. This pair continues to reside in cluster 24-1.

An additional 5 RCWs were moved in on-site translocations. We again tried in February to move a female to the bachelor male in cluster 28, this time using an undispersed, juvenile female from cluster 5 on SRS. This second attempt was a short-term success. The female remained in the cluster with the male for one month. She disappeared just prior to the breeding season and the male remained alone in the cluster.

By February, many juvenile RCWs had not dispersed from their natal clusters. SEFES and SRFS personnel by this time had established several new recruitment and replacement (R & R) stands having artificial cavities. Several of these juvenile RCWs that had not dispersed were used in an attempt to establish new pairs in these new stands. In our first attempt we moved a juvenile male from cluster 5 and a juvenile female from cluster 19 to cluster 1. The female returned immediately to cluster 19 and the male was next observed in cluster 18. He continues to reside in cluster 18 and we anticipate moving a female to him this fall.

In our second attempt to create a new breeding pair, we moved a juvenile male from cluster 19 and a juvenile female from cluster 39 to cluster 24-2. Following their release the male returned

to cluster 19, where he remains as a helper, and the female was not observed again.

As indicated by these unsuccessful attempts at translocating birds to establish a new pair as well as by our previous research, it is necessary to develop a technique that will increase the site tenacity of released birds. We are constructing a mobile aviary that is being set up on the SRS. By maintaining the pair one to two weeks in the aviary prior to release, it is hoped the birds will adjust to the new environment and remain there upon release. We will test our technique using a surrogate species this fall.

Flying Squirrel Control

We continue to remove southern flying squirrels each month from natural cavities, excavated cavities, and squirrel nest boxes. We removed squirrels from active clusters 2, 3, 5, 6-43, 16, 18, 19, 28, and 39, inactive clusters 1, 15, 30, and 40, and R & R stands 81-1, 24-1 and 27-1. In the first 10 months of FY 1992, we removed 120 flying squirrels during more than 1,500 checks of cavities (nest boxes, natural and artificial cavities). The total number of cavities checked per month varied as we established additional artificial cavities. Of the cavities checked, an average of 26% were natural cavities, 52% were artificial cavities and 22% were boxes. In comparison, 28% of the squirrels removed were in natural cavities, 58% were in artificial cavities, and 13% were in boxes. The use of nest boxes to reduce cavity competition between flying squirrels and RCWs has been successful. However, we now catch fewer flying squirrels in boxes than we did

in the earlier years of this study.

In 1991, the Department of Biology, Wake Forest University, made arrangements to obtain live flying squirrels from SRS through SEFES for behavioral research. Researchers at Wake Forest are studying the effect of diet on the prevalence of a parasitic nematode found in southern flying squirrels. To accommodate this research SEFES personnel held some of the removed squirrels for live transport to Wake Forest University in FY 1992. Additional uses for the squirrels are currently under consideration, including food use and genetic studies.

Artificial Cavity Construction

Only 5 RCWs were present in 1985 when SEFES contracted with DOE to establish a viable RCW population at SRS. Most stands designated for RCW use were younger than typical RCW habitat. In some suitably-aged stands all the cavity trees had died and were no longer available for RCWs. In some areas, other woodpecker species had enlarged most of the cavities. This shortage of suitable cavities, which the birds use for nesting and roosting, combined with the long time required for the RCWs to construct new ones (1-3 years) posed a serious impediment to restoring this population.

To enhance the recovery potential of the SRS population, David Allen, a SEFES Wildlife Biologist, developed a technique for creating new RCW cavities. This procedure involves cutting a hole in a living pine tree and inserting a prefabricated cavity having the same dimensions as the hole. Artificial cavities can be placed in any age pine having a diameter greater than 15 inches, thus

allowing cavity installation in the younger RCW stands. This technique is now widely used on other forests and notably was instrumental in conserving the Francis Marion National Forest population after it was devastated by Hurricane Hugo. A Technical Report by Mr. Allen entitled, "An Insert Technique for Construction of Artificial Red-cockaded Woodpecker Cavities" has been published by SEFES.

There are currently 100 artificially excavated RCW cavities on the SRS; fifty-two were constructed this year. New artificial cavities were established in existing clusters and recruitment stands. Active cluster sites were supplemented with artificial cavities when the number of existing cavities did not support the current or anticipated number of individuals in the cluster or to raise the number of available cavities in inactive clusters to a minimum of four. In recruitment stands we installed three or four artificial cavities per 10 acres of recruitment area. The new recruitment stands with artificial cavities will be used to establish new breeding pairs through translocations and to facilitate naturally occurring dispersal of RCWs.

RCWs successfully produced young from nests in three artificial cavities and two natural cavities this year. Nine of the artificial cavities and 15 natural cavities are currently used by RCWs for roosting. In comparison, six artificial cavities and 15 natural cavities were used for roosting and two artificial cavities and 4 natural cavities were used to nest successfully in 1991. Although RCWs at SRS use artificial cavities, it is not known whether an artificial cavity is preferred to a natural cavity. The clusters in which RCWs use artificial cavities no longer contain natural cavities thought to be suitable for their use.

We replaced one cavity that was damaged by pileated woodpeckers. Destruction of artificial cavities by other species of woodpeckers has decreased with the addition of a metal cavity restrictor created by SEFES personnel, which covers the entire face of the artificial cavities.

Genetics Research

Given the low number of RCW's at SRS, matings between close relatives are inevitable, with reductions in individual fitness a likely consequence. In 1990 SEFES initiated a cooperative study with the Fish and Wildlife Service Cooperative Research Unit, Clemson University, to provide guidelines for a controlled translocation and breeding program for the SRS population. Based on genetic analyses of blood taken during 1990 and 1991 from RCWs on SRS and on population projection models, S. Haig, J. Belthoff, and D. Allen compared enhancement strategies in their manuscript, "Population Viability Analysis for a Small Population of Red-cockaded Woodpeckers and an Evaluation of Enhancement Strategies," which was recently accepted by the journal Conservation Biology. Further examination of the genetic analysis is covered in a second manuscript, "Examination of Population Structure in Red-cockaded Woodpeckers Using DNA Profiles" accepted by the journal Evolution.

Dr. Haig is now developing guidelines for choosing individuals or populations to serve as donors or recipients of RCWs. She is currently profiling the genetic structure for 12 woodpecker populations, including the SRS, to develop a regional perspective on the genetics of RCWs in the Southeast. SEFES continues to work closely with Dr. Haig to evaluate genetic considerations associated with translocation strategies.

Group Observations and Reproduction

The 1992 SRS population consists of eight breeding pairs and a total of 38 individuals (Figure 1). The number of fledging RCWs, a measure of reproductive success, continues to increase (Figure 2). The sex-ratios of the total population and fledglings are of interest in evaluating the reproductive potential of the population and in determining the number of translocations that may be conducted within the SRS and from other populations (Figures 1,2). Except for 1988, the sex-ratios of the total population and fledglings have not changed significantly. SEFES has spent over 500 hours observing RCW groups in 1992. These data provide information on reproductive status, cavity usage, and general population trends for mortality, immigration and emigration. This information is necessary for planning future translocations. SEFES personnel has climbed SRS cavity trees over 1500 times in the last year to monitor reproductive activity, remove flying squirrels, and conduct cavity maintenance. We feel that these intensive research and management activities play a key role in the expansion of the RCW population at SRS.

Ten groups were active (2, 3, 5, 6-43, 16, 18, 19, 24-1, 28, 39) before the breeding season of 1992. Eight of these (2, 3, 5, 6-43, 16, 19, 24-1, 39), contained at least one male and one female and two groups contained solitary males. Five groups successfully fledged at least one young this year, producing a total of thirteen young (7 females, 6 males), with a mean reproductive rate of 1.6 young fledged per breeding pair. Four of the five groups that successfully produced young (Figure 3) did so on their first attempt. The other group was successful on their second

Figure 1. Post-Breeding Season Population Size for the Red-cockaded Woodpecker at the Savannah River Site.

Figure 2. Number of RCW Fledglings at the Savannah River Site.

Figure 3. Post-breeding Season Group Status and Adult Population Size for the Red-cockaded Woodpecker at the Savannah River Site.

attempt. The remaining three groups all failed to produce young in one or two attempts. There was no evidence to suggest the cause of these nest failures.

Recently, an inactive cluster (40) has become active with the arrival of a single male who was an auxiliary male from group 2. The male traveled over 12 miles to establish this new active cluster. This male has been observed to roost in a new natural cavity tree bringing the number of active groups on the SRS after the 1992 breeding season to 11. Three of these contain a solitary male and one contains an unmated male living with his brother and offspring.

PLANS FOR FY-1993

The primary focus for 1993 will continue to be population expansion. Ongoing monthly observations to obtain group composition data are essential to monitor the status of the population. SEFES and SRFS personnel will continue to create artificial cavities for RCWs in cluster sites and R&R stands. New R&R stands will continue to be selected as long as the population goal of 250 successful annual breeding groups exceeds the number of existing groups.

Several translocations of RCW's from donor populations to SRS have been planned for this fall. The priority will be to move juvenile females to each of the three solitary males plus the unmated male residing with his brother (for a total of four currently unmated males). The current group composition at SRS should provide several on-site translocation opportunities for subsequent relocations.

Past translocation efforts have revealed that female RCWs remain in the area in which they are moved more often than males. We are constructing an aviary to test the feasibility of

maintaining RCWs at the translocation site to familiarize them with the site prior to their release.

We suspect that site familiarity will improve the success of our translocations. By enclosing one or possibly two cavity trees within our aviary we intend to optimize opportunities for the acclimation of a translocated pair of birds. If translocations using this aviary are successful, the technique could be applied to relocating small populations from private to federal lands. We anticipate testing the technique this fall.

We will continue to remove flying squirrels from active and inactive clusters and R and R stands near active groups. When removing squirrels we will monitor and maintain artificial and natural cavities. SEFES personnel are investigating methods to understand better the use of cavities and nest boxes by flying squirrels.

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