

659

HURRICANE ANDREW'S EFFECTS ON RED-COCKADED WOODPECKERS

AND THEIR HABITAT

IN BIG CYPRESS NATIONAL PRESERVE

APRIL 1993 - DECEMBER 1995

DEBORAH K. JANSEN

WILDLIFE BIOLOGIST

AND

DR. JIM SNYDER

RESEARCH BIOLOGIST

BIG CYPRESS NATIONAL PRESERVE

I. STATEMENT OF PROBLEM AND BACKGROUND

Red-cockaded woodpecker (RCW) research and monitoring in Big Cypress National Preserve (BICY) have included recent emphasis on the relatively isolated set of breeding groups in Lostmans Pines (LP). This array of eight known breeding clusters comprises a substantial portion of the BICY population, which constitutes the largest and potentially most viable remaining in southern Florida. These RCWs represent the extreme southern limit of the species' distribution and are probably as adaptively unique as the pine forests they inhabit, which thrive at an elevation of 1 meter.

The LP sub-population probably was once part of a more continuous distribution throughout BICY, the pinelands north and west of the preserve, and the Miami Rock Ridge forests, including Long Pine Key (LPK) in Everglades National Park, where RCWs were extirpated in the early 1960s (Patterson and Robertson 1981). In recent times, the LP sub-population undoubtedly served as an important component in the southern Florida range of the RCW, and it will serve as an important link with more northerly populations should RCWs be reintroduced into LPK.

Hurricane Andrew's 50 km-wide path of greatest impact included the 1,800 ha of pinelands in LP. Field surveys done within one month of the hurricane revealed extensive damage to the old growth pines within the known clusters and moderate damage to surrounding foraging habitat, which consists of a higher proportion of second-growth forest. Only four (12%) of the 33 active and inactive cavity trees checked were intact. The rest were either uprooted or snapped off. The status of all pines with a DBH of greater than 25 cm were assessed in three 50 x 50 m plots of foraging habitat. Of these, 47% were either uprooted or had broken boles, and another 32% suffered major branch loss. Additional tree mortality is expected due to lowered disease and insect resistance (Hooper et al. 1990, Conner et al. 1991). During approximately 17 hours of mid-day field work in three of the eight known clusters, only one RCW was observed. RCWs are best detected, however, early or late in the day. Definitive estimates of survival and the ability of the remaining habitat to support a viable population will require more extensive field study.

Hurricanes occur with sufficient frequency in the southeastern coastal plain to warrant serious consideration in the development of long-range viability analyses and management plans for RCWs (Hooper et al. 1990). The potential impact of hurricanes will continue to increase as the remaining US RCW population becomes more fragmented. Hurricane Andrew dramatically demonstrated the need for taking all reasonable care to maintain BICY's RCW population in its entirety, including spatially distinct sub-sets such as in LP. Had Andrew tracked 40 km to the north, the

majority of BICY's RCW clusters would have been severely damaged, leaving LP as the principal source of recolonizing birds. Previous studies (Engstrom and Evans 1990, Hooper et al. 1990, Conner et al. 1991) have demonstrated the value of data on the response of RCWs to hurricanes and management recommendations that will reduce future impacts. These studies also outline the research necessary to evaluate habitat suitability and formulate management strategies for restoration following a hurricane.

II. OBJECTIVES

- 1) Determine the number and status of the RCWs in LP.
- 2) Assess the suitability of the remaining living pines (roosting, nesting, and foraging habitat) for supporting a viable population of RCWs.
- 3) Determine the longer-term (3-year) impacts of the hurricane on all pine age classes.
- 4) Recommend habitat enhancement techniques (e.g., prescribed fire, mechanical means) that will foster rapid redevelopment of the pine overstory and minimize mid-story growth.
- 5) Bolster the extant population of RCWs through cavity provisioning and/or augmentation with additional birds.

This phase will be initiated if sufficient habitat remains or, within a reasonable period of time, will become available through development of second-growth pines or the presence of adequate heart rot in the living mature pines. Both techniques, cavity provisioning and augmentation, have been highly successful (Copeyon 1990, Copeyon et al. 1991, Allen 1991, Taylor and Hooper 1991), particularly in the Francis Marion National Forest following Hurricane Hugo.

III. METHODS

Field work will be conducted with the help of two seasonal field technicians during April, May, and June from 1993 to 1995.

- 1) Study plots containing the cavity tree clusters and the contiguous pine islands of the eight previously known RCW activity centers will be established. During the first year of the 3-year study, each plot will be monitored a minimum of five times at dawn or dusk. Playbacks of recorded RCW vocalizations will supplement visual observations. Each unbanded RCW will be trapped and fitted with a unique combination of colored plastic leg bands to permit subsequent individual identification. Standard RCW trapping and marking techniques have been used and refined in BICY over the last two years.

2) The LP forest will be assessed using standard vegetation point sampling methods (Mueller-Dombois and Ellenberg 1974) in which DBH, basal area, stem density, crown closure, crown height, and relative proportions of mature and second-growth trees will be measured. Points will be randomly distributed throughout the pine forest within each plot. Understory and mid-story will be qualitatively evaluated to direct enhancement efforts toward the overall goal of restoring the overstory component. Habitat suitability will be determined by comparing current conditions with existing data for cavity tree selection in BICY and with the results of a 1991 radio-tracking study, which measured total area and basal areas for the foraging ranges of three RCW groups in LP. Pre- and post-hurricane basal areas around each active cavity tree in those three clusters have already been compiled (there was a significant decline). Habitat assessments will take into account the time needed for second growth stands to reach a suitable age for cavity excavation and for the development of heart rot in the remaining mature trees.

3) As many as six species of beetles (Coleoptera: Buprestidae) present in southern Florida are known to infect stressed pines. The progression of infestation and subsequent mortality will be monitored on the study plots.

4) The two greatest threats to the remaining forest are catastrophic fire, due to greatly elevated fuel loads, and development of the midstory, which strictly limits use by RCWs and will result from the diminished overstory canopy. The proposed study will recommend target areas and appropriate modifications of current policy to assure suppression of wildfire, safe reduction of fuel loads, and control of midstory development.

5) If bird surveys and habitat assessments indicate that it is warranted and feasible to maintain the LP RCW sub-population, cavity provisioning and/or translocations will be attempted. If several birds remain and most are paired, but cavity sites are limiting, either or both of two artificial cavity techniques (inserts or excavations) will be applied (see references under section II). These methods have proven highly successful as both habitat enhancement and in response to the massive loss of mature trees (particularly those with cavities) following Hurricane Hugo. Translocations also have been highly successful in other studies. Birds of a specific sex, which would serve as mates for unpaired survivors in LP, or even potential pairs could be moved from elsewhere in BICY or from privately-owned sites in southwest Florida that are threatened by development. The combination of artificial cavities and translocations would be a particularly expeditious approach to restoration if the present and projected suitability of LP is found to be sufficient.

IV. PERSONNEL

Deborah Jansen, BICY Wildlife Biologist, will serve as project director and will supervise two GS-5 technicians during their three-month appointments. The director will be responsible for data analyses and for providing all oral and written reports. Jim Snyder, BICY Research Biologist, will provide project oversight and phase approval.

V. DELIVERABLES

Progress reports will be provided at monthly intervals from April through June each year. Annual reports will be provided by 31 December 1993 and 31 December 1994. Oral briefings will be given upon request to the appropriate NPS office. The final report will be provided by 31 December 1994.

VI. BUDGET

1ST year

1. Personnel: Director - salary provided by BICY.
Technicians (2, GS-5, 3 months each) -
\$9,000 + 1,350 (15%) fringe benefits
2. Equipment: 4-wheel ATCs (2), with trailer - \$6,500
Camping equipment - \$1,000
3. Capture equipment (Swedish ladders, telescoping poles,
netting): \$2,000
4. Miscellaneous equipment and repair: \$1,000

Total 1st year costs: \$20,850

2nd year

1. Personnel: Same as 1st year
2. Equipment: None
3. Capture equipment: None
4. Miscellaneous equipment: Same as 1st year

Total 2nd year costs: \$11,350

3rd year

Same as 2nd year

Total 3rd year costs: \$11,350

Total budget: \$43,550

Additional Supplies/Services Provided by BICY

Two-wheeled-drive vehicle, fuel, and maintenance
Global Positioning Unit
Geographic Information System Use and Direction
Prescribed fire personnel

VII. LITERATURE CITED

- Allen, D. H. 1991. An insert technique for constructing artificial red-cockaded woodpecker cavities. U.S. For. Serv. Gen. Tech. Rep. SE-73. 18 pp.
- Conner, R. N., D. C. Rudolph, D. L. Kulhavy, and A. E. Snow. 1991. Causes of mortality of red-cockaded woodpecker cavity trees. J. Wildl. Manage. 55(3):531-537.
- Copeyon, C. K. 1990. A technique for constructing cavities for the red-cockaded woodpecker. Wildl. Soc. Bull. 18:303-311.
- Copeyon, C. K., J. R. Walters, and J. H. Carter III. 1991. Induction of red-cockaded woodpecker group formation by artificial cavity construction. J. Wildl. Manage. 55(4):549-556.
- Engstrom, R. T. and G. W. Evans. 1990. Hurricane damage to red-cockaded woodpecker (Picoides borealis) cavity trees. Auk 107:608-610.
- Hooper, R. G., C. J. Watson, and R. E. F. Escano. 1990. Hurricane Hugo's initial effects on red-cockaded woodpeckers in the Francis Marion National Forest. In: Trans. 55th N. A. Wildl. & Nat. Res. Conf. (1990); Denver, CO. Washington, DC: Manage. Inst:220-224.
- Mueller-Dombois, D., and H. Ellenberg. 1974. Aims and methods of vegetation ecology. John Wiley and Sons, New York, N. Y.
- Patterson, G. A. and W. B. Robertson, Jr. 1981. Distribution and habitat of the red-cockaded woodpecker in Big Cypress National Preserve. South Florida Res. Ctr. Rept. T-613. 137 pp.
- Taylor, W. E. and R. G. Hooper. 1991. A modification of Copeyon's drilling technique for making artificial red-cockaded woodpecker cavities. U.S. For. Serv. Gen. Tech. Rep. SE-72. 31 pp.