



# PROPOSAL TO ENHANCE HABITAT FOR CERULEAN WARBLERS ON THE CHATTAHOOCHEE-OCONEE NATIONAL FORESTS

Nathan Klaus, Nongame Endangered Wildlife Natural Heritage Section,  
Georgia Department of Natural Resources and  
James Wentworth and Mike Hurst,  
U.S. Department of Agriculture – Forest Service



April 4, 2002

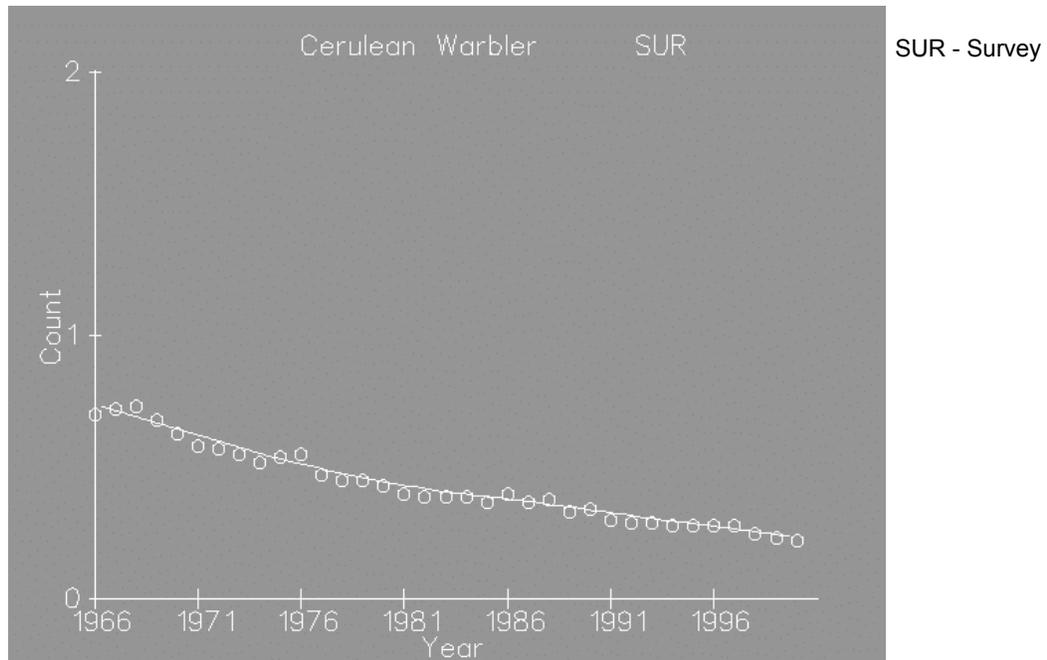
The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

## INTRODUCTION

The cerulean warbler (*Dendroica cerulea*) has been experiencing an average annual decline of 4.2 percent per year from 1966–2000 according to breeding bird survey data (Sauer et al., 2001) (Figure 1). This rate of decline was the greatest for any warbler species. Because of this decline

the cerulean warbler was listed in 1991 as a Category 2 (C2) candidate for endangered species listing. Since that time this species has continued to decline, and many conservation groups are making significant efforts to list the cerulean warbler as endangered.



**Note:** Cerulean warblers have experienced an annual decline of 4.2% ( $p < 0.01$ ).

**Source:** J. R. Sauer, J. E. Hines, and J. Fallon, 2001, *The North American Breeding Bird Survey, Results and Analysis 1966–2000, Version 2001.2*, U.S. Geological Survey Patuxent Wildlife Research Center, Laurel, MD.

**Figure 1. Annual Breeding Bird Data for Cerulean Warblers Surveywide**

Biologists are beginning to gain insight into this species' breeding habitat requirements, which may indicate the reasons for this decline. Several studies during the last decade have determined that the cerulean warbler is highly selective in its habitat requirements. Specifically, the cerulean warbler—as well as many other bird species—favor mature, mesic hardwood sites with a diverse and well-developed canopy structure including:

canopy gaps and associated midstory and understory vegetation (Ramey, 1996; Buehler and Nicholson, 1998; Rodewald and Smith, 1998; Nutt, 1998). While a growing portion of the landscape in the Southern Appalachians consists of large hardwoods, most sites have very simple canopy structures (Runkle, 1985). This is likely the result of previous even-aged timber management, resulting in forest stands of approximately equally aged trees

with low mortality and few canopy gaps. Several mechanisms lead to a well-developed canopy including natural mortality of old trees, storm damage, and uneven-aged timber harvest. Because of historic land management most of our hardwood forests have a contiguous canopy layer formed by mature trees with small, poorly developed crowns. When tree mortality occurs, only small canopy gaps (<500 sq. ft.) result due to the small, poorly developed tree crowns. Since it will more than likely take centuries to recover to natural tree mortality rates and the multilayered canopy (and the uneven-aged stand structure needed by cerulean warblers), it has been proposed that wildlife biologists may artificially create this canopy structure through the use of small

group selection cuttings (Ramey, 1996; Rodewald and Smith, 1998). If successful, these methods could be used to sustain cerulean warblers populations until natural dynamics begin to provide habitat for this critically imperiled species. Based on known sites occupied by cerulean warblers in the Chattahoochee National Forest, stands suitable for these habitat enhancements would be mature mesic hardwoods that lack a well-developed canopy structure. Figure 2 shows significant even-aged canopy structure, resulting from historic clearcutting. Figure 3 shows an uneven-aged canopy structure found in old-growth forests as well as storm-damaged areas and selectively harvested areas. These figures show the differences between even-aged and uneven-aged structures.

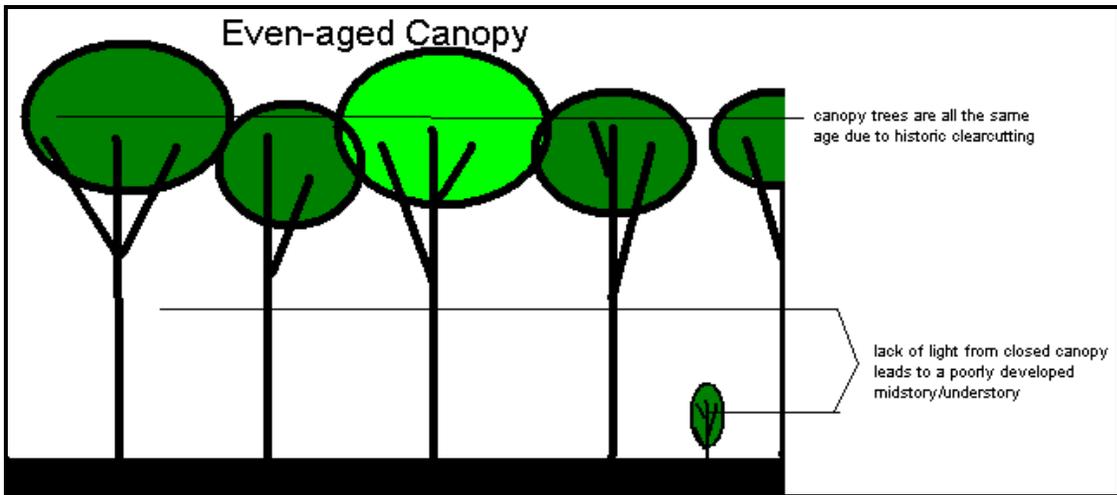


Figure 2. Even-aged Canopy Structure

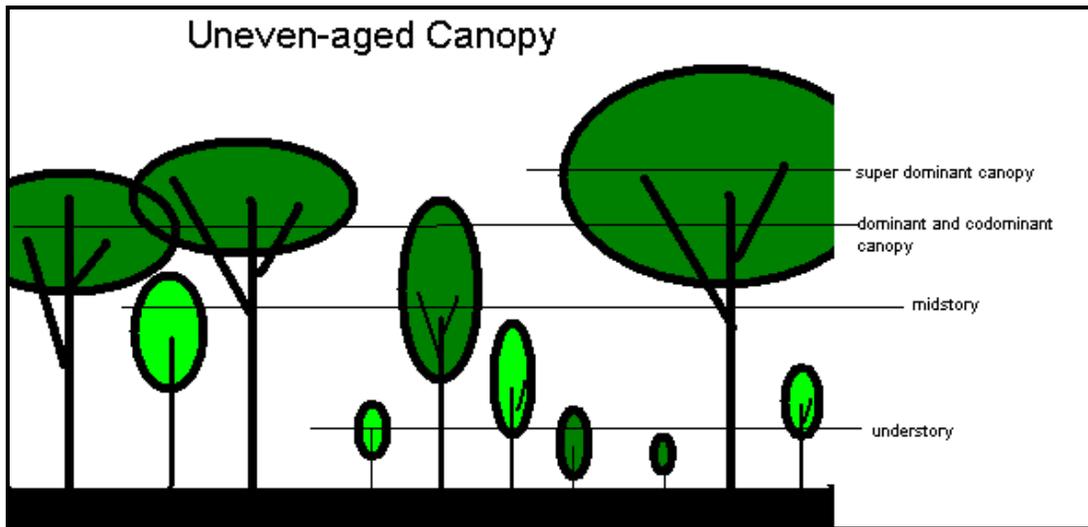


Figure 3. Uneven-aged Canopy Structure

## METHODS

We propose to study this management system of diversifying the canopy structure to enhance habitat for cerulean warbler on several sites in the Chattahoochee National Forest. Small groups of trees or cohorts would be felled to create from  $\frac{1}{4}$ - to  $\frac{1}{2}$ -acre gaps in the canopy. Light reaching the forest floor would help germinate small trees and enhance any existing midstory of the stand, creating the canopy structure needed by cerulean warblers. Stands of trees will be selected by screening Forest Service CISC data of stands that are near average values for cerulean occupied stands elsewhere. We will look at stand age, forest type, site index (productivity) and elevation. We will attempt these treatments on 30 ten-acre plots. Half of these plots will be located very close to known cerulean sites; the other half will be where none have been documented. Monitoring will



determine whether the cerulean warblers will colonize new sites when they become available. We also propose to evaluate several treatment types using group selection of  $\frac{1}{4}$ -acre openings and  $\frac{1}{2}$ -acre openings. Point counts and playback surveys would be used from 1 to 2 years prior to treatment to document the bird use and ensure that the cerulean warbler does not occupy sites. We would also conduct surveys of vegetation diversity and structure prior to treatment. We would conduct point counts annually following harvest for at least 5 years to monitor bird response. We would also conduct vegetation surveys every third year following treatment to monitor changes in vegetation structure. Dr. Robert Cooper (University of Georgia - Athens) has tentatively indicated an interest in studying the results of such treatments.

Cerulean Warbler Photograph Courtesy of  
Wisconsin Department of Natural Resources

## LITERATURE CITED

- Buehler, David A., and Charles P. Nicholson. May 1999. Ecology of the cerulean warbler in the Cumberland Mountains and the Southern Appalachians – 1998 Annual Report. Tennessee Department of Forestry, Wildlife and Fisheries, University of Tennessee.
- Nutt, L. N. 1998. An interim management policy for *Dendroica cerulea*. Clinch Ranger District, USDA Forest Service. 32 p.
- Ramey, J. F. 1996. Cerulean Warbler draft habitat management policy national forests in North Carolina. USDA Forest Service. 7 p.
- Rodewald, P. G., and K. G. Smith. 1998. Short term effects of understory and overstory management on breeding birds in Arkansas oak-hickory forests. *Journal of Wildlife Management* 62:1411–1417.
- Runkle, J. R. 1985. Disturbance regimes in temperate forests. Pages 17-33 in *The ecology of natural disturbance and patch dynamics*. Academic Press, Inc.
- Sauer, J. R., J. E. Hines, and J. Fallon. 2001. The North American Breeding Bird Survey, Results and Analysis 1966–2000. Version 2001.2, U.S. Geological Survey Patuxent Wildlife Research Center, Laurel, MD.