



**STATUS: HIGH
CONSERVATION
PRIORITY IN IOWA**

Cerulean Warbler

Dendroica cerulea

Introduction

This small, canopy-foraging Neotropical migrant insectivore breeds across much of the eastern United States in locally mature deciduous forests punctuated with broken canopies. With sky blue upper plumage, busy sky high in the canopy, the Cerulean Warbler is difficult to observe, and has been little studied.

This species forages and nests higher in the canopy than the majority of warblers, and migrates farther and earlier, than most others. Its social system remains poorly understood; and management actions to enhance its habitat have not yet been clearly specified.

Although the Cerulean Warbler was formerly among the most abundant breeding warblers in the Mississippi River valley, its numbers plummeted in the 1900s. Concern for the future of this species is warranted. Yet even in the face of steep declines, some populations seem to be holding on.



Habitat Preferences

Cerulean Warblers have been routinely identified with predominantly forested landscapes, mature woodlands, large and tall trees of broad-leaved, deciduous species with an open understory and gaps in the canopy; in wet bottomlands, or drier upland situations.

Historical accounts described this species as especially abundant in old-growth bottomland forests of the Mississippi Alluvial Valley, and most of these forests no longer exist. Dry and semi-dry upland forests of the type this species once inhabited are now scarce as well (replaced by farmland); occurrence in flood plains thus may be an artifact, rather than a preference.

Cerulean Warblers are usually considered to be an area-sensitive species. The estimated minimum woodland tract size required to support stable breeding populations varies from about 10 acres estimated by some researchers to more than 3,200 acres suggested by other researchers working in the Mississippi Alluvial Valley. It seems fairly obvious that this popular but quickly declining species will receive much greater attention from investigators in the future, and the new data will hopefully address and resolve woodland management questions.

Feeding Habits

Cerulean Warblers are primarily insectivorous, foraging on insects in the upper foliage of the large trees they inhabit. Insect food is taken from leaf bases and foliage in the canopy of a great variety of trees. No tree species seems to be preferred. The primary mode of foraging is gleaning insects from leaves and twigs, and moving rapidly from limb to limb.

Breeding Biology

Cerulean Warblers arrive in Iowa in late April to early May, with the male preceding

the female by a few days to establish a territory. Pair formation begins soon after the females arrive.

Nesting behavior has been little studied due to the difficulty of observing the nests placed so high in tall trees.

Nests are probably constructed by the female only, and are placed on a horizontal branch of a deciduous tree, far from the trunk and usually from 15 to 90 feet off of the ground. Oak, maple, basswood, elm, hickory, and sycamore trees seem to be favored, although other species of trees are also utilized for nesting.

Nests contain from 3 to 5 eggs, but usually 4. Incubation is by the female only, and lasts for 11 to 12 days. Both parents feed the nestlings. The age at which the young leave the nest is not well known.

It is thought that Cerulean Warblers are not the victim of nest parasitism by Brown-headed Cowbirds as often as many other species, as long as large, unbroken mature woodlands are available for nesting. However, Cerulean Warblers have been found to suffer from nest parasitism more frequently when they are forced to nest in fragments of once larger woodlands.

Concerns and Limiting Factors

The Cerulean Warbler is currently listed as a species of high conservation priority by Iowa's IBA Program but if populations continue to decline, it might soon slip into a more serious category such as threatened or endangered.

Previous Breeding Bird Survey (BBS) information has shown that the Cerulean Warbler has experienced a dramatic long-term population decline that averaged 3.4% per year (e.g. a 68% loss in number in just 20 years). This is the greatest decline of any warbler and one of the greatest of any passerine (perching bird) species in North America. From this, as well as other newer data, it is obvious that this species clearly

merits close scrutiny and careful protection wherever it occurs in Iowa, and across its entire range.

Land-use changes brought about by increasing human populations within the breeding, migratory, and winter ranges of Cerulean Warblers appear to be the underlying cause of the population decline during the late 20th Century. For example, within its breeding range, the preferred habitat types are becoming scarcer, and more fragmented, due to human land-use practices, diseases of tree species, insect blights, and other factors.

Researchers have identified 4 breeding-season constraints, and each of these relate to habitat. They are:

- 1.) Loss of mature deciduous forest, especially along stream valleys: This is clearly the most serious long-term problem facing the species on its breeding grounds.
- 2.) Fragmentation and increasing isolation of remaining mature deciduous forest: Perhaps more than most North American bird species, the Cerulean Warbler is sensitive to landscape-level changes in habitat.
- 3.) Change toward shorter rotation periods and even-aged management of woodlands, so that less deciduous forest habitat reaches maturity. As land uses become more competitive with each other on a regional scale, pressure to achieve particular rates of return on investment increases – and populations of Cerulean Warblers (as well as other species) steadily decrease.
- 4.) Loss of key tree species, especially oaks from oak wilt and gypsy moths, sycamores from a fungus, elms from Dutch elm disease, and American chestnuts from chestnut blight.

The extent to which Cerulean Warblers are limited by migratory-stopover habitats is unclear, but thought to be a serious

problem that may well be getting worse. Numerous ecologically interesting and relevant habitat management questions remain unanswered about the species, and further, more comprehensive research is certainly needed.

Habitat Management Recommendations

Current conservation actions for Cerulean Warblers include planning projects that use estimates of minimum tract size for the species as criteria for habitat acquisition, protection, and management. No specific results of long-term experimentation with woodland management on its breeding grounds are known to exist at this point.

Simple protection woodlands in as large a blocks as possible, and wise application of sound woodland management principles applied to breeding habitats, are the primary tools available to an individual land manager in Iowa.

For Cerulean Warblers, management of breeding habitat means management for premium quality saw-timber products, involving long rotations with intermediate treatments directed toward fostering tall trees with large diameters, and full canopies of dominant trees. It also means strategies to produce a varied 3-dimensional stand with extensive development of vertical diversity, such as tall canopies of dominant and canopy emergent trees towering above mid-story or intermediate trees. Conditions such as these can be produced by uneven-aged management of extensive stands, and by old-growth management techniques that foster an extensive network of canopy gaps. Other strategies, including even-aged management with long rotations, may also be effective.

Landscape context of the managed stands is an important woodland management consideration because the Cerulean Warbler is area-sensitive, and found only in

large tracts of woodland. Future policy and land-use planning decisions that favor the existence of large tracts of woodland and forest, or landscapes that are primarily forested, will definitely benefit these birds. Where woodland landscapes can be self-sustaining, i.e., maintained by their own reproduction, Cerulean Warblers will likely prosper. Where extensive economic subsidy is required to maintain the landscape in primarily forested condition, the future of the species would seem more tenuous.

Cerulean Warblers may respond favorably where consolidation and expansion of Iowa's woodlands has taken place. With implementation of sound woodland management practices, and with more attention being paid to IBA Criteria Species, this species should be able to sustain its population.

For general assistance see the section on Woodland Management for Birds, and for more specific details see the section Recommended Woodland Management Practices. Both are found in Part 3.