

SPECIES PROFILE

Cerulean Warbler

Dendroica cerulea

Federal Listing: Not listed
State Listing: Special Concern
Global Rank: G4
State Rank: S3B
Author: Pamela D. Hunt, NHA

ELEMENT 1: DISTRIBUTION AND HABITAT

1.1 Habitat Description

During the breeding season, cerulean warblers occupy 2 different types of hardwood forest: floodplain and upland. The species occurs along major rivers, or occasionally on lakes, in closed canopy and among scattered tall trees (Hamel 2000a, b). In parts of Appalachia, cerulean warblers also use mesic forests on mountain slopes. In these uplands, the highest warbler densities occur in oak-hickory and beech-maple stands (Hamel 2000a, Rosenberg et al. 2000).

Within both habitat types, birds prefer areas with taller trees, though empirical data are few (Hamel 2000a). Increasing evidence suggests that canopy gaps are also important (Oliarnyk and Robertson 1996, Hamel 2000a), although the extent to which such an association reflects a preference for old-growth forest conditions is unclear. Gaps in many of the forest types used by the species may be created by flooding or other natural disturbances unrelated to forest age (Jones and Robertson 2001). Gaps may also be mimicked by protruding canopy on forested slopes or by periodic forest management (Hamel 2000a).

Data are equivocal on the effects of disturbance on populations. There is some indication that the species is area sensitive, with minimum areas of 700 and 1,600 hectares (1,750 and 4,000 acres) in the Mid-Atlantic and lower Mississippi regions, respectively (Hamel 2000a). Some stable populations require areas as large as 8,000 ha (20,000 acres). Again, high variability across the species' range makes generalizing

habitat needs difficult, and area sensitivity may be tied to broader patterns of landscape use and forest type.

Ceruleans in New Hampshire appear to use both upland and floodplain hardwood forests. The primary population at Pawtuckaway State Park occupies a mixed red oak/red maple/white pine forest (New Hampshire Division of Parks and Lands, unpublished data) that occurs at relatively high elevation (400 to 900 ft) on variable slopes. This is most similar to the habitat used in the northern Appalachians (Rosenberg et al. 2000). Mount Wantastiquet in Hinsdale/Chesterfield is another steep, upland hardwood site (35% grade) with records of ceruleans. The red maple dominated floodplain of the Blackwater River in Salisbury also has multiple records and is typical of floodplain in the area. Here, less prominent trees include American elm, white ash, silver maple, and birches (Foss et al. 2000, unpublished data). Floodplain at the mouth of the Ashuelot River in Hinsdale may also host cerulean warblers.

1.2 Justification

The cerulean warbler has declined dramatically in the last 40 years (Robbins et al. 1992, Sauer et al. 2004), although increases have been noted in parts of the Northeast since the late 1980s. The small New Hampshire population, first detected in 1992, may be associated with this regional increase. Because of its overall rarity in New England, the species is included in the Comprehensive Wildlife Conservation Strategies in all 6 states. Because of its decline, it is similarly listed throughout its range.

1.3 Protection and Regulatory Status

This species is federally protected by the Migratory Bird Treaty Act, which prevents the killing of most non-game birds and the collecting of their nests or

eggs. The cerulean warbler is not protected under the federal Endangered Species Act, although it has been nominated for listing as “threatened”.

1.4 Population and Habitat Distribution

With the exception of records from 1918 and 1929, all records of cerulean warbler in New Hampshire come after 1970. If isolated May records represent errant migrators, there remain 8 areas with records suggestive of at least the potential for breeding activity because they were later in the spring (table 1).

Of these areas, only Pawtuckaway has a consistent history of use by ceruleans, although the Wantastiquet and Blackwater sites would benefit from more regular and intensive surveying. Numbers of territorial males at Pawtuckaway have ranged from one to 4 (possibly 5) since the species was first detected there in 1992. The maximum count came during intensive surveys in 2002 (Hunt 2003), and may thus better reflect the actual population at the site. Breeding was first confirmed in 1995, when a female was observed carrying nesting material. The following year a nest was found during construction and was observed through the fledging of 2 to 3 young in June.

Pawtuckaway marks the northeastern-most known locality for ceruleans in North America, and New Hampshire appears to have been colonized fairly recently. Small isolated populations also occur along Lake Champlain in Vermont (Laughlin and Kibbe 1985) and around the Quabbin Reservoir in Massachusetts (Veit and Petersen 1993). The species is more common to the south and west and at several sites in Connecticut (Zeransky and Baptist 1990), New York (Andrle and Carroll 1988), and southeastern Ontario (Jones and Robertson 2001).

This recent colonization is consistent with a gradual shifting of the range to the north and east since 1966 (Hamel et al. 2004). According to BBS data, populations at the northeastern edge of the range have been increasing since the late 1980s (Sauer et al. 2004). However, over the range as a whole, including high-density regions such as the Appalachians, Midwest, and central Mississippi Valley, the species has declined at an annual rate of 4.2% since 1966 (Sauer et al. 2004). Even at the northern periphery, where range expansion is occurring, productivity may not be high enough to compensate for mortality (Jones et al. 2004).

1.5 Town Distribution Map

Not completed for this species.

1.6 Habitat Map

1.7 Sources of Information

Basic natural history information in this profile was largely gathered from the literature cited in section 5. Cerulean warbler data for New Hampshire came from New Hampshire Bird Records.

1.8 Extent and Quality of Data

Of the locations listed above for cerulean warblers, only Pawtuckaway is regularly surveyed. Thus, although data indicate the presence of ceruleans at other locations such as Hinsdale and Salisbury, they do not guarantee frequent habitation. Even at Pawtuckaway, there has been only one effort to assess the overall population size (Hunt 2003).

1.9 Distribution Research

Although the cerulean warbler is rare in the state, more data on its actual distribution would be valuable for conservation concerns. Searches of known or potential cerulean habitat could document the species' presence in parts of the state other than Pawtuckaway State Park and thus provide a better idea of its status in the state. Initial efforts should focus on the lower Connecticut Valley and the Blackwater River, where the bulk of recent sightings (away from Pawtuckaway) have occurred.

ELEMENT 2: SPECIES/HABITAT CONDITION

2.1 Scale

Cerulean warblers occur primarily in the lower Connecticut River Valley, on the Blackwater River, and in the Pawtuckaway Highlands. Habitat delineations should extend beyond immediate sighting locations to include adjacent areas of suitable habitat, as near Pawtuckaway where the Canadia site may be hospitable.

2.2 Relative Health of Populations

Data are insufficient to address population health for

all areas except Pawtuckaway. At this site, the population appears to have remained relatively constant (1 to 4 males) for over a decade.

2.3 Population Management Status

There is currently no management of cerulean warblers in New Hampshire.

2.4 Relative Quality of Habitat Patches

All 3 units appear to provide quality habitat for cerulean warblers. All are relatively large blocks of forest, and with the exception of the Ashuelot River mouth, are protected to some degree (see section 2.5).

2.5 Habitat Patch Protection Status

All 3 locations with multiple records of cerulean warblers are protected by fee-simple ownership. Mount Wantastiquet and the Pawtuckaway highlands are both owned by NHDRED, and neither is subject to extensive recreational development. The Blackwater River site is owned by the USACE as part of a flood control project. The other high potential sites in table 1 (particularly the Ashuelot River mouth and Granite Lake) are not protected.

2.6 Habitat Management Status

There is no specific management of cerulean warbler habitat in New Hampshire.

2.7 Sources of Information

Information on areas used by cerulean warblers in New Hampshire was obtained from New Hampshire Bird Records.

2.8 Extent and Quality of Data

With the exception of the Pawtuckaway highlands, data on cerulean warbler use of most units identified in section 2.1 are minimal. The absence of records from either should not be taken as an indication that the species has not been present in a given breeding season.

2.9 Condition Assessment Research

In the absence of good distribution data, it is difficult to identify potential research questions pertaining to habitat condition. Given the small size of the known population, it is not clear whether meaningful indicators could be developed to assess population health. The best option may simply be to devise a regular monitoring program to detect changes in population size and site occupancy.

ELEMENT 3: SPECIES AND HABITAT THREAT ASSESSMENT

3.1 Identification of threats

Over much of the breeding range, habitat loss is a major cause of population decline (Hamel 2000a, b; Rosenberg et al. 2000). Similar conversion of primary forest in the South American wintering range is also implicated in the decline, although data on winter habitat use are incomplete (Robbins et al. 1992, Hamel 2000b). In the Northeast, where populations appear to be increasing, perhaps because of ongoing reforestation (Jones and Robertson 2001), the major threats are likely to be fragmentation and isolation of currently occupied areas. In all areas of the range, land-use may have increased brood parasitism by brown-headed cowbirds (*Molothrus ater*), a species which is more common along marginal areas (Hamel 2000a).

Given that most threats are related to habitat loss, the small cerulean warbler population in New Hampshire does not appear to be under any immediate threats at the state level. The primary population occurs in an undeveloped area of a state park, and other sites with recent sightings during the breeding season are conserved (section 2.5). Cowbird parasitism may be an important factor, but data on its magnitude and effects within the state are completely unknown.

3.2 Sources of Information

Information on threats to cerulean warblers was obtained from the scientific literature on the species.

3.3 Extent and Quality of Data

Data on regionally identified threats to this species at

the scale of New Hampshire are insufficient.

3.4 Threat Assessment Research

It would be worthwhile to determine the rates of habitat loss in the vicinity of the 3 units listed in section 2.1. Although the areas where ceruleans have been recorded are protected, the possibility of area sensitivity in this species should be taken into consideration. In the event that a given unit is under greater threat from landscape-scale habitat conversion, land protection activity in that unit should be considered (element 4).

ELEMENT 4: CONSERVATION ACTIONS

No threats to this species are independent of threats to its preferred habitats, and thus no additional conservation actions need detailed discussion. However, the possibility of land protection in the vicinity of core areas should be considered when prioritizing reserve creation. Focusing land conservation on the 3 cerulean warbler units potentially would benefit the warbler, and would enhance habitat quality for associated species and natural communities.

4.2 Conservation Action Research

There are insufficient data to determine whether active management can benefit cerulean warblers (Hamel 2000a), though undue manipulation might harm them. Given what is known about cerulean warbler habitat preferences elsewhere, it may be worth investigating the species' habitat use in New Hampshire in more detail. Any data collected could be compared with those collected elsewhere in an effort to determine whether any specific management practice (e.g., timber harvest rotations, selective cutting, etc.) would affect the species. With sufficient information, it may be possible to manage existing sites for the cerulean warblers, but this should not be undertaken until more about its habitat needs is known.

ELEMENT 5: REFERENCES

5.1 Literature

- Andrle, R.F., and J.R. Carroll. 1988. *The Atlas of Breeding Birds in New York State*. Cornell University Press, Ithaca.
- Foss, C.R., P.D. Hunt, and D.B. Wells. 2000. Floodplain Bird report. Report to New Hampshire Department of Environmental Services, New Hampshire Audubon, Concord.
- Jones, J., and R.J. Robertson. 2001. Territory and nest-site selection of Cerulean Warblers in eastern Ontario. *Auk* 118: 727-735.
- Jones, J., J.J. Barg, T.S. Sillett, M.L. Veit, and R. Robertson. 2004. Minimum estimates of survival and population growth for Cerulean Warblers (*Dendroica cerulea*) breeding in Ontario, Canada. *Auk* 121: 15-22.
- Hamel, P.B. 2000a. Cerulean warbler status assessment. U.S. Fish and Wildlife Service, Minneapolis, Minnesota, USA.
- Hamel, P.B. 2000b. Cerulean Warbler (*Dendroica cerulea*). In *The Birds of North America*, No. 511, A. Poole and F. Gill, editors. The Birds of North America, Inc., Philadelphia, PA.
- Hamel, P.B., D.K. Dawson, and P.D. Keyser. 2004. How we can learn more about the Cerulean Warbler (*Dendroica cerulea*). *Auk* 121: 7-14.
- Hunt, P.D. 2003. Summary of 2002 Breeding Bird Atlas at Pawtuckaway State Park. Report to New Hampshire Department of Resources and Economic Development, New Hampshire Audubon, Concord.
- Laughlin, S.B., and D.P. Kibbe. 1985. *The Atlas of Breeding Birds of Vermont*. University Press of New England, Hanover, New Hampshire, USA.
- Oliarnyk, C.J., and R.J. Robertson. 1996. Breeding behavior and reproductive success of Cerulean Warblers in southeastern Ontario. *Wilson Bulletin* 108: 673-684.
- Robbins, C.S., J.W. Fitzpatrick, and P.B. Hamel. 1992. A warbler in trouble: *Dendroica cerulea*. Pages 549-562 in *Ecology and Conservation of Neotropical Migrant Landbirds*, J.M. Hagan and D.W. Johnston, editors. Smithsonian Institution Press.
- Rosenberg, K.V., S.E. Barker, and R.W. Rohrbaugh. 2000. An atlas of Cerulean Warbler populations.

Report to U.S. Fish and Wildlife Service, Cornell Laboratory of Ornithology, Ithaca, New York, USA.

Sauer, J.R., J.E. Hines, and J. Fallon. 2004. The North American Breeding Bird Survey, Results and Analysis 1966-2003. Version 2004.1, USGS Patuxent Wildlife Research Center, Laurel, MD.

Veit, R.R., and W.R. Petersen. 1993. Birds of Massachusetts. Massachusetts Audubon Society.

Zeranski, J.D., and T.R. Baptist. 1990. Connecticut Birds. University Press of New England, Hanover, New Hampshire, USA.

5.2 Data Sources

NHBR. New Hampshire Bird Records, New Hampshire Audubon, Concord.

Distribution of Cerulean Warbler in New Hampshire

Distribution

-  Known
-  Potential
-  Historic



Known = confirmed breeding observations as reported in the NH Natural Heritage Bureau's Element Occurrence Database and obtained from NH Bird Records and the NH Breeding Bird Atlas, Audubon Society of New Hampshire.
Potential = possible breeding and other observations from the same data sources.
Historic = observations greater than 20 years old.

