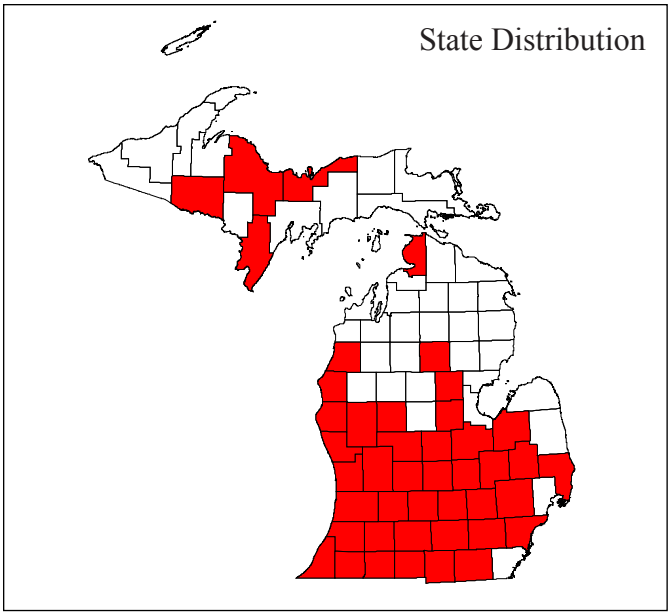
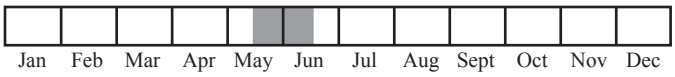
Dendroica cerulea Wilson — cerulean warbler

Photo by Bill Dyer - C.L.O



Best Survey Period



Status: State threatened

Global and state ranks: G4/S3

Family: Parulidae (wood warblers)

Total range: Cerulean warblers are widely distributed in eastern and central North America from the southern Great Lakes to Quebec south to the northern regions of the Gulf states and west to eastern Oklahoma and southeastern Nebraska. The winter range stretches from Colombia and Venezuela south to eastern Peru and northern Bolivia (American Ornithologists' Union. 1998). Their winter habitat is concentrated on the eastern slopes of the Andes Mountains in western South America at a very narrow elevational zone between 620 and 1300 meters (Robbins et. al. 1992).

State distribution: In the late 1800's and early 1900's this species was most abundant in the southeastern part of the State. However, by 1950 their breeding range had begun to shift north and west. This trend has continued up to the present due to widespread urbanization and agricultural land use that has severely decreased forested habitats in the southeast. Despite the overall range expansion in Michigan, cerulean warblers are still rare in the north and are thought to be declining dramatically in the southwest (Adams 1989). Breeding records have been confirmed in thirteen Michigan counties since 1983 including Allegan, Barry, Berrien, Calhoun, Cass, Clinton, Kalamazoo, Livingston, Marquette, Montcalm, St. Clair, Tuscola, and Washtenaw. Breeding is probable in Alger, Eaton, Hillsdale, Ingham, Iron, Jackson, Lapeer, Livingston, Mason, Manistee, Menominee, Midland, Muskegon, St. Joseph, Oakland, Oceana, Ottawa, Van Buren and Wayne counties. Breeding is possible in Branch, Emmet, Genesee, Gladwin, Gratiot, Ionia, Kent, Lenewee, Mecosta, Newago, Roscommon, Saginaw, and Shiawassee counties (Adams 1991, Michigan Natural Features Inventory 2000).

Recognition: Cerulean warblers often prove difficult to identify by sight since they forage, sing, nest and roost high in the canopy of mature forests. These birds are **small and short-tailed** with **two wide white wing bars** and **white tail-spots**. The **adult males** are **bright blue above** and **white below** with a **black necklace** that extends between the shoulders and across the breast. They are most easily confused with male northern parulas (*Parula americana*), although parulas show an additional chestnut band beneath the black, which is surrounded by bright yellow rather than white. **Adult females** have **greenish upperparts** that become bluer at the crown and rump and darken considerably at the eyeline, wings and tail. The **throat and breast are entirely pale yellow.** The combination of **two wide wing bars and a prominent, pale yellow eyebrow** separate female cerulean warblers from most similar summer inhabitants of Michigan, including the northern parula and Tennessee warbler (*Vermivora peregrina*). Immature birds generally resemble the respective adults. Because of the difficulty in viewing cerulean warblers, the best tool with which to locate and identify them is their song. The **song**, given only by the male, opens with an **accelerating series of short buzzes, all**

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on one pitch and **closes with a single longer higher buzz**.. **"zray zray zray zreeee"**. The song is similar to that of the northern parula and the black-throated blue warbler (*Dendroica caerulescens*), but can be distinguished with practice.

Best survey time: The best time to survey for cerulean warblers is from mid May through mid June, as breeding males readily sing on their territories during this time. Adults do sing through early July although their song is not as regular and is more variable later in the breeding season (Adams pers. comm.) A standard survey methodology for warblers is to systematically place observation points every ¼ mile throughout suitable habitat. At each observation point an observer listens for 10 minutes and records all birds observed and/or heard within 50 meters and beyond 50 meters of the survey point (Ralph et. al. 1995). Another simple method is to simply walk, or in some cases, use a canoe to conduct a count along a transect through suitable habitat during the breeding season, recording individuals observed and/or heard (Bibby et. al. 1992). The use of taped playback calls in appropriate habitat can also be an effective method for surveys although they should be used with discretion to avoid disturbing birds needlessly (Adams pers. comm.). All surveys should be conducted between sunrise and 10:30 am during good to fair weather conditions (e.g., low winds, dry).

Habitat: During the breeding season, the cerulean warbler selectively inhabits mature deciduous forest preferring mesic to wet stands over more xeric forest. The canopy can be closed to partly open and although the amount of underbrush can vary, they are most commonly found in areas with an open understory. Bottomlands, particularly floodplains, are usually preferred over uplands Areas that offer topographic relief such as slopes and ridges also seem to be preferred for nesting (Adams pers. comm.). Cerulean warblers tend to saturate lowland areas to use all available space present, while birds that nest in upland habitats tend to aggregate within only a part of the available space (Hamel 1988, Robbins et. al. 1992,Vanderah 1993). Many observers have frequently noted that the species occurs in groups or "colonies" during the breeding season (Adams pers. comm., Hamel 2000). Cerulean warblers have been designated as area sensitive since they are most commonly found in large forest tracts that are 3,000 hectares (ha) or greater. The probability of occurrence is reduced by half when tract size falls to 700 ha (Robbins et al. 1989). After forest area, the most critical factor in determining the suitability of habitat is thought to be tree size. Large, tall, trees are favored for both perching and nesting and habitats without such trees are typically rejected (Robbins et. al 1992, Vanderah 1993). In Michigan, the lowland habitat of choice is generally dominated by silver maple (*Acer saccharinum*), ash (*Fraxinus* spp.), and sycamore (*Platinas occidentalis*). Where cerulean warblers occupy upland forests in the state, the tree species typically present are beech (*Fagus* spp.), maple (*Acer* spp.), oak (*Quercus* spp.), black walnut (*Juglans nigra*) and older black locust (*Robinia pseudo-acacia*) (Adams 1991).

Biology: Cerulean warblers are classified as Neotropical migrants and undertake a complete migration every year. Though some birds arrive in Michigan in late April, the first or second week of May are more typical arrival dates, with peak arrival about the middle of the month. Fall migration occurs from July through September, with birds reaching the South American wintering grounds as early as August (Adams 1991, Bent 1963). Males usually arrive on the breeding grounds at least a week earlier than the females. They establish and maintain their territory primarily by singing, although aggressive physical combat is sometimes involved (Hamel 2000). Nests are built exclusively by the females high in the canopy on horizontal branches. Although not completely characterized, nests usually consist of a neat cup of bark fibers and shreds, lichen, moss and fine grasses bounded with spider webs and lined with hair and fruiting moss stems (Baicich and Harrison 1997). They typically decorate the outside of their nest with some small gray or white materials (Hamel 2000). Cerulean Warblers are apparently monogamous and usually produce only one brood per pair each year. Generally 4 eggs are produced and are incubated solely by the female for 11 to 13 days (Baicich and Harrison 1997, Hamel 2000). The young are altricial (hatched with eyes closed, with little or no down, incapable of departing from nest, and fed by the parents) at hatching and are thought to leave the nest after 10 to 11 days. Adult and juvenile cerulean warblers are insectivorous, foraging in and about the foliage of deciduous trees for small arthropods primarily by gleaning insects from leaves (Hamel 2000).

Conservation/Management:. The cerulean warbler has been ranked by the bird conservation organization, Partners in Flight (PIF), as a species of high priority for conservation action. The PIF watch list includes those birds of the continental United States not already listed under the Endangered Species Act that warrant conservation attention. Population trends of cerulean warblers have been monitored with the U.S. Fish and Wildlife Service Breeding Bird Survey (BBS). Between 1966-1987, cerulean warblers experienced an average decline of 3.4% per year nationwide (Hands et. al 1989). This is the most precipitous decline for any warbler species, and only five other species in North America exhibited greater declines (Robbins et. al 1989). The rangewide decline is most pronounced in the core of their breeding range rather than at the edge of the range, which is further cause for concern (Hamel

1992, Robbins et al. 1989).

Cerulean warblers face threats on their breeding and wintering grounds as well as during migration. Primary threats on the breeding grounds include: (1) loss of mature deciduous forest, especially along stream valleys; (2) fragmentation and increasing isolation of remaining mature deciduous forest; (3) emphasis on even-aged management and shorter rotation periods; (4) environmental degradation from acid rain and stream pollution; (5) loss of key tree species especially oaks from oak wilt and spongy moths, sycamores from a fungus, elms from Dutch elm disease, and American chestnuts from chestnut blight; and (6) nest parasitism by the brown-headed cowbird (Robbins et. al 1989). Hands et. al (1989) lists contaminants, predation, competition, diseases/parasites, weather, and human disturbance as additional potential limiting factors. Human habitat disturbance is proceeding most rapidly in western South American Andean montane forests at elevations between 500-1500 m, the area thought to be the predominant overwintering habitat for the cerulean warbler (Hamel 1992). Storms encountered by birds crossing the Gulf of Mexico contribute significantly to mortality during spring and fall migration (Adams pers. comm.). Collisions with TV and cellular towers are an added threat to birds, although since cerulean warblers are one of the earliest fall migrants, these casualties are probably underreported (Robbins et. al 1989).

Hamel (1992) has called for preservation of tracts of intact mature forest of at least 4,000 ha across the breeding range of the bird, with minimal perimeter lengths relative to their area. Hands et. al (1989) suggest a lower limit of 700 ha for preserves, but note that more data from across their range is needed to identify the minimum size of forest tracts required to support stable populations. In Michigan, Adams (1991) recommends the preservation of all extensive areas of remaining habitat, particularly larger tracts of floodplain forest. Robbins et. al. (1989), suggest that by concentrating on protecting old growth floodplain habitat required by this species, that many other Neotropical migrants will benefit as well, especially those considered area-sensitive. Low-intensity land uses such as single-tree selective timber removal may be compatible with cerulean warbler management especially if the openings created approximate natural treefall gaps (Hamel 1982). The use standard of Best Management Practices (BMP's) by foresters is recommended. Enforcement of existing wetland-protection regulations also should help protect lowland hardwood forests for cerulean warblers (Hands et. al. 1989). The fact that many known populations of the species are already restricted to public land indicates that public land managers at the state and federal levels could determine the future of this species (Hamel 1982).

Research needs: Surveys are needed to provide data on population size and to monitor population changes. The biology of this species is not well known and additional research on its life history and habitat requirements are needed (Adams 1991, Robbins et. al 1989). Because cerulean warbler nests are so difficult to monitor, very little information has been gathered on reproductive success, predation rates, or species known to prey on eggs and nestlings (Flaspohler 1993). Research should also concentrate on finding ways to supplement even-age management with retention of enough old-age trees to make managed timber lands attractive to cerulean warblers (Robbins et. al. 1989).

Related abstracts: mesic northern forest, northern goshawk, red-shouldered hawk, wood turtle, eastern box turtle, showy orchis, and ginseng.

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