



Credit Jim Williams

Connecticut Warbler Minnesota Conservation Summary

*Audubon Minnesota
Spring 2014*



The *Blueprint for Minnesota Bird Conservation* is a project of Audubon Minnesota written by Lee A. Pfannmuller (leepfann@msn.com) and funded by the Environment and Natural Resources Trust Fund. For further information please contact Mark Martell at mmartell@audubon.org (651-739-9332).

Connecticut Warbler

Priority for Minnesota's Bird Conservation Plan:

- Aspen Parkland: High Level Priority
- Boreal Hardwood Transition: Moderate Level Priority

Other Status Classifications:

- Minnesota Species in Greatest Conservation Need
- On Audubon Minnesota's Action List
- USFS Sensitive Species on both the Chippewa and Superior National Forests
- A Focal Species for the Upper Mississippi River/Great Lakes Joint Venture Region
- Identified by Partners in Flight (PIF) Tri-National as a Common Species in Steep Decline; 70% of the population has been lost
- Identified by PIF National as a Stewardship Species (PT=4; possible or moderate population decline); Stewardship Responsibility: Northern Forest Region; Conservation Action: Management
- PIF BCR12: Regional Concern Species: Action is Management

Population Information:

- U.S. and Canada population estimate: 1,200,000 (U.S. PIF Plan)
- Continental Population Objective: Maintain although the PIF Population database notes that the population target is to increase by 50%
- Species has experienced a 45% national decline from 1966 – 2006.
- BBS data indicate that there has been a decline in Connecticut Warbler populations in North American of 2.9% over 103 routes from 1966-2007 (Lapin)
- UMVGL Joint Venture Population Target is 73,660; Current estimate is 48,570.
- The species has the most restrictive breeding distribution of any northern warbler aside from the Kirtland's warbler (Conservation Assessment).
- Minnesota population estimate: 38,000; Target Population is 57,000
 - ✓ Estimated MN population in BCR11: 500; target is 750
 - ✓ Estimated MN population in BCR12: 37,000; target is 56,000

Minnesota BBS Data:

- Yellow Level of Regional Credibility
- 1966-2009: decreasing trend (not statistically significant) of -1.8; 1999-2009; decreasing trend of -1.9.
- Minnesota does not include one of the species centers of highest abundance
- 6.38% of the Connecticut Warbler's North American breeding range occurs in Minnesota; 3.2 % of the warbler's population occurs in Minnesota.
- Average # birds/route is 0.37; found on 20 of 74 routes
- Decreasing population trend on the Chippewa National Forest (91-07)
- Annual surveys in the Western Great Lakes National Forests have indicated a decline in Connecticut Warbler populations since the early 1990s (Lapin).

Minnesota Residency:

- Breeds in northeast and north-central Minnesota

Habitat Requirements: Forest

Breeds in open woods in north-central U.S.; primarily poorly drained areas, including spruce-tamarack forests, wet second-growth forests, grassy margins along spruce forests or deciduous forests, and jack pine barrens. Habitat in nw. Ontario: wet areas with black spruce & tamarack; similar habitat in Minnesota (Birds of North America)

From NRRI Species Account:

- Breeding habitat includes mature black spruce-tamarack bogs and jack pine barrens with a thick shrub understory. Hence, the species is classified as associated with mature, coniferous forests.
- It is most abundant in mature, lowland coniferous habitats and is uncommon to rare in other types of coniferous vegetation.

From Lapin M.S. Thesis:

- In Minnesota, Connecticut Warbler breeding habitat consists of mature, lowland coniferous habitats, primarily black spruce and tamarack bogs with dense underbrush, scattered trees and grassy openings.
- In those bogs where breeding Connecticut Warblers have been confirmed, trees are typically well-spaced and there is usually moss ground cover under a layer of low-lying Labrador tea and swamp laurel.
- Of those stands surveyed (i.e. all those surveyed by NRRI on the national forests), the most Connecticut Warbler occurrences were recorded in black spruce forest cover, followed by tamarack and mixed swamp conifer respectively.
- At the smallest spatial scale (100 m buffer) high ground cover vegetation density, low percentage canopy cover, and low percentage of lowland deciduous forest are important
- At the 500 m scale, the warbler's abundance and frequency were positively associated with percent lowland black spruce forest and negatively associated with percent alder willow habitat. Connecticut Warblers are more commonly associated with habitats consisting of a ground layer of Sphagnum, Labrador tea, and swamp laurel, than will alder willow habitat. In addition, they are associated with low tree density and high tree density variance.
- At the largest and best performing spatial scale examined, the 1,000 m buffer, presence of upland coniferous forest and lowland black spruce forest and absence of upland deciduous forest were important predictors of Connecticut Warbler breeding habitat. Connecticut Warblers would most likely be found in large, unfragmented stands of upland and mature lowland coniferous forests.
- It appears that Connecticut Warblers rely on large landscape characteristics when selecting breeding habitat, even when small-scale habitat variables appear to be suitable.

From British Columbia species account:

- Connecticut Warblers winter further south than most other North American warblers and so have a longer distance to travel during migration.
- In British Columbia the species is found primarily in aspen uplands.

From Conservation Assessment of Connecticut Warbler:

- Habitat types used during the breeding season vary across Minnesota, Wisconsin and Michigan and this phenomenon has also been reported in Canada where regional habitat associations in Ontario are different from those in Saskatchewan.
- Callog (1994) listed the existence of a well-developed understory as the most important habitat characteristic.
- The sizes of bogs where Connecticut warblers have been observed are described as relatively small bogs that are 100 acres in size or less.
- Mature, short-needle, conifers, usually single-aged, either lowland conifer or jack pine with the key feature appearing to be an ericaceous (a heath or in the heath family) shrub layer up to about 3 feet high.
- It does not appear to be an edge sensitive species in that it doesn't avoid edge habitat.

- In Minnesota, the species is found at a higher degree in boggy areas with black spruce; also using tamarack bogs, aspen and jack pine but to a much lesser degree.

From the UMVGL JV LBCP Species Profile:

- Open woods or semi-open forest with patches of dense understory. This includes poorly drained spruce-tamarack or wet pole-sized forests as well as dry oak-pine forest or jack pine barrens.
- In Minnesota, breeding densities reported between 2.9 -5.6 pairs/ha and in closed spruce forests to average 2.1 pairs/ha.
- Throughout its breeding range this species is through to be uncommon, local and at low densities.

From WBCI Species Profile:

- The Connecticut Warbler primarily inhabits poorly drained areas, including spruce-tamarack forests, wet second-growth forest, and grassy margins along spruce or deciduous forests.
- Forest structure is generally open with a dense shrub and herb layer up to 1 meter high.
- Patch size and other landscape needs are not well known; however, Connecticut Warblers do occur in relatively small bogs (< 40 ha) and they do not appear to be edge sensitive.
- Connecticut Warbler nests on or near the ground, in the thick undergrowth of saplings, clumps of moss, and thickets.

Migration: Neotropical

Area Sensitivity: Considered an area sensitive species (Green; Birds and Forests)

Climate Change Vulnerability: Medium (2)

Threats/Issues:

From Bird Conservation: Western Great Lakes Basin:

- Breeding habitat may be affected by power lines on breeding grounds.
- An uncommon warbler on its breeding grounds; status needs study and clarification.

From BNA Species Account:

- During migration, numerous accounts of birds colliding with human-made structures.
- May be vulnerable to habitat loss on its wintering grounds

From Lapin M.S. Thesis:

- Nest predation
- Changes in landscape and loss of nesting habitat as a result of fragmentation and climate change
- Changes in habitat due to biomass harvesting (peat mining)
- Collisions with man-made structures
- Though not apparently in immediate danger, the Connecticut Warbler has the potential to become a high priority species due to its specific habitat requirements and threats to its nesting habitat.

From Conservation Assessment for the Connecticut Warbler:

- Broods have been parasitized by brown-headed cowbirds
- During migration there are some accounts of Connecticut warblers flying into towers as well as lighthouses, and other buildings.
- It is likely that the range reductions in Minnesota from historical range has been due to the loss of suitable nesting habitat in more southerly portions of the warbler's range.

MINNESOTA GOAL: Increase by 50% current populations in Minnesota secure better population estimates and investigate incorporating Connecticut Warbler population management and monitoring as part of the goals for High Conservation Value Forests in northern counties.

BEST MANAGEMENT PRACTICES

From Conservation Assessment of the Connecticut Warbler:

- There are no existing management activities being implemented on the Michigan, Minnesota, and Wisconsin National Forests.
- Draft standards and guidelines have been written for the Chequamegon-Nicolet National Forest; they include:
 1. Lowland conifer and black ash swamps should be treated only in experimental regeneration efforts, salvage, and other unique situations, which would benefit or not decrease Connecticut Warbler breeding habitat
 2. Maintain or increase current amount of jack pine on the forest in suitable soil types and historic jack pine areas through both reforestation planting and as a within stand conifer component. Look for areas to do jack pine restoration
 3. Harvesting of jack pine should be accomplished in blocks of 100+ acres wherever possible.
- Other practices identified by the Chequamegon-Nicolet National Forests as being beneficial to Connecticut warbler habitat is:
 1. Replanting jack pine instead of red pine in areas treated
 2. Harvest jack pine in larger blocks
 3. Maintaining within stand jack pine components
 4. Maintaining mossy ground cover.
- Low intensity prescribed fire to maintain jack pine and the shrub layer may improve habitat for this species.
- Protecting areas with ericaceous understory would benefit this warbler

From WBCI Species Profile:

- Management efforts focused on increasing total acreages of jack pine and conifer barrens will likely benefit Connecticut Warblers.
- Maintaining jack pine habitats with trees at least 4.5 m in height may be important.
- Land managers should also consider using prescribed burning to manage and naturally regenerate northern dry forests where possible.

From NRRI Species Account:

- Management prescriptions on bird species as poorly known as the Connecticut Warbler are speculative. It is likely, however, that historical range reductions in Minnesota have been due to loss of suitable nesting habitat in more southerly portions of this species range.
- Maintenance of mature black spruce bogs is essential.

From Lapin M.S. Thesis:

- Due to its dependence on landscape level habitat factors, the Connecticut Warbler could be strongly and possibly negatively impacted by forest management practices.
- Although its primary breeding habitat, lowland coniferous forests, is infrequently altered by forestry practices, upland forest management could also have implications for habitat availability.
- Management will involve preserving large, unfragmented tracts of upland and mature lowland coniferous forests.

From PIF Physiographic Region 20 (BCR12) Plan; recommendations for Forest dependent species; selected below are those most pertinent to Connecticut Warblers:

- Preserve large tracts of mature coniferous and mixed forest edge contiguous to large inland lakes, including the Great Lakes.
- Where possible, maximize the amount of forest interior (and minimize disturbance within it) to benefit area-sensitive and forest-interior species. Openings, including roads and power lines, should be concentrated along existing edges (Faaborg et al. 1995).
- Promote structural diversity (vertical and horizontal) at the landscape scale, including patches of early-, mid-, and late-successional forest in a range of patch sizes (Thompson et al. 1995).

Note: For certain species near the edge of their ranges in BCR 12 (e.g. Connecticut Warbler), it may be difficult to impossible to achieve population goals through habitat management, as factors other than management issues are likely responsible for their current distribution in the BCR.

MONITORING RECOMENDATIONS

The Federal Breeding Bird Survey may be inadequate given the northern distribution and low route density. Improvements in BBS and boreal surveys are needed to better monitor population change.

CONSERVATION ACTIONS

- Identify and target high priority landscapes and habitats for conservation action

Action: Identify Important Bird Areas that are a priority for this species in Minnesota

- **Upper Mississippi Valley/Great Lakes Joint Venture**

Action: Protect 300,000 ha (741,316 acres) of existing habitat area and quality in Minnesota's Bird Conservation Region 12 and enhance or restore 56,500 ha (139,615 acres) of habitat in the same region at multiple sites. Management should maintain openings and a dense understory.

Background: The habitat goal is based on the highest habitat needs of species within the Evergreen Forest Guild which included Olive-sided Flycatcher, Connecticut Warbler and Cape May Warbler (Habitat Goals, UMVGL JV Landbird Implementation Strategy). To meet the needs of the Connecticut Warbler alone, the recommendation is to protect 7,400 ha of habitat and restore/enhance 3,800 ha.

Action: Consider designation of site-specific Forest Bird Conservation Areas as one vehicle for sustaining Connecticut Warbler populations in northern Minnesota

Background: Landscape-level planning for forest birds is a dynamic process that considers the size, shape, composition, and juxtaposition of forest communities with the ecological and habitat requirements of bird species over time (Green 1995). This plan proposes to establish multiple Forest Bird Conservation Areas (FBCAs) within BCR 12 that are large enough to maintain or restore components of the historic landscape that are important to birds. The overall objective in establishing FBCAs is to provide a framework for the long-term conservation of forest birds by applying general strategies known to benefit both bird generalists and specialists. Components include:

1. Maintain large contiguous forest tracts and manage in large blocks;
2. Restore connectivity between large tracts;
3. Minimize isolation of forest patches;
4. Maintain a well-developed and diverse understory;
5. Encourage a variety of seral stages and more forest interior for area-sensitive species; and

6. Limit narrow, linear tracts to reduce the ratio of edge to interior in managed areas (Robbins 1979, Rosenberg et al. 1999).

Another important component of the FBCA framework is to establish an old-growth core reserve area (surrounded by a buffer zone where no silvicultural activities occur) to benefit forest-interior species and other priority species (Leopold 1938, Robbins et al. 1989a).

This plan calls for multiple 4500 hectares (11,000 acres) FBCA management units in the region, each with an old-growth core of 3000 hectares (7400 acres). Where FBCA management units cannot be designated, satellite Forest Bird Management Areas (FBMAs) should be established. In general, 1000 contiguous hectares (2500 acres) of forest will meet the habitat area requirements of many priority forest birds (Robbins 1979).

Outstanding opportunities for implementing conservation measures, including the establishment of FBCAs and FBMA, occur at the following Minnesota locations:

- Beltrami Island State Forest
- Boundary Waters Canoe Area
- Chippewa and Superior National Forests
- Isle Royale National Park
- Itasca State Park
- Voyageurs National Park

RESEARCH NEEDS

From Wisconsin Bird Conservation Initiative Species Profile:

- This species is one of the poorest known of all North American passerines. Studies in all aspects of its breeding biology are urgently needed.
- More research is needed on how various forest management practices impact breeding and on its distribution and ecology on the wintering grounds.
- The Connecticut Warbler may be important to monitor as an indicator of climate change effects.

From UMVGL JV LBCP Species Profile:

- Detailed studies of the general biology of Connecticut Warblers are needed on the breeding grounds, including estimates of breeding densities and productivity throughout its breeding range in the Joint Venture region.

From A Conservation Assessment for the Connecticut Warbler:

- A study on any aspect of its general biology would be valuable.
- Specific research priorities listed in the species account for the Connecticut Warblers in The Birds of North America include:
 1. Feeding habits on breeding and wintering grounds and during migration
 2. Fledging development and age of departure
 3. Extent of parental feeding and protection after young leave the nest
 4. Development, growth rate, locomotion and temperature regulation
 5. Brooding
 6. Extensive of parasitism by brown-headed cowbird
 7. Reproductive success
 8. Breeding and winter ranges and threats to these areas
 9. Geographic variation, sexual dimorphism, age variation
 10. Vocal differences between sexes and birds of different ages;
 11. Vocal behavior on wintering grounds and during migration
 12. Micro- and macrogeographic variation among songs of the male Connecticut warblers
 13. Effects of degradation of habitat

From PIF Plan for Physiographic Region 20 (BCR12) specifically for forest birds:

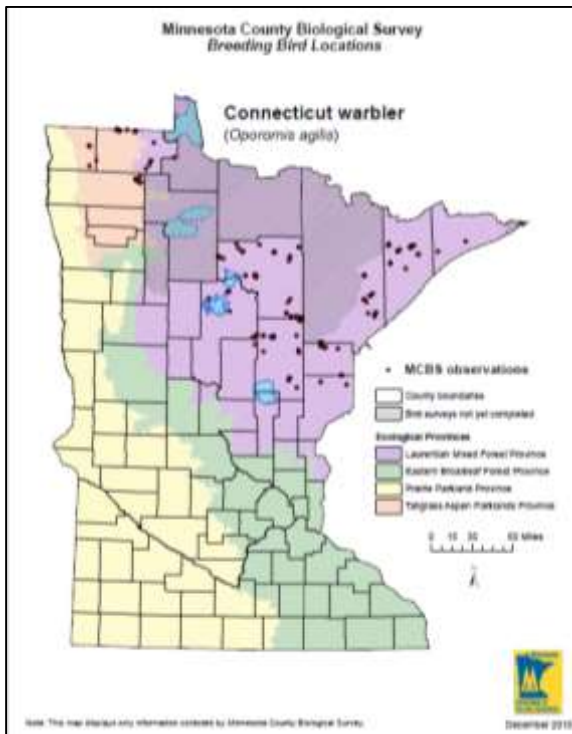
- Conduct breeding ecology studies of species for which little is known, such as Nashville Warbler, Black-throated Green Warbler, Blackburnian Warbler, Connecticut Warbler, Rose-breasted Grosbeak, and Purple Finch.
- Standardize breeding bird atlas and other monitoring methods across the states.
- Examine the effects of different silvicultural practices on occurrence, breeding density, and productivity on select priority species.
- Examine the impacts of increasing populations of forest generalist species, such as Blue-winged Warbler and American Robin.
- Determine the impacts of rural housing on bird populations and nest success.
- Identify and protect source areas for imperiled species.
- Identify landscape-scale factors required by forest birds and where on the landscape to manage for them given current land cover and land use.

Effectiveness Measure: Eliminating the current population deficit requires a 50% population increase. Management actions should result in a 50% increase in BBS index or an average of 3% annually over a 15 year period.

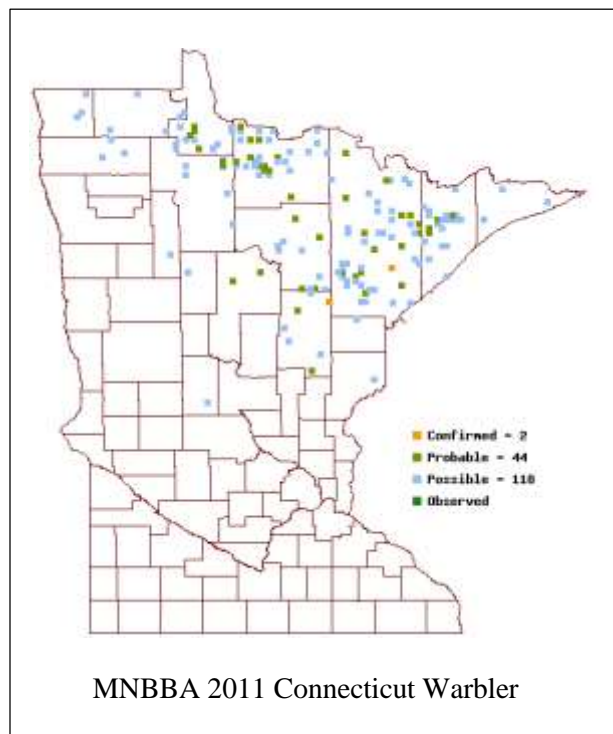
Connecticut Warbler Distribution Maps



Birds of North America <http://bna.birds.cornell.edu/bna/>



MN DNR http://www.dnr.state.mn.us/eco/mcbs/bird_map_list.html



MN Breeding Bird Atlas <http://www.mnbba.org/>