# Canada Warbler (*Cardellina canadensis*) Species Guidance

Family: Parulidae – the wood-warblers

**Species of Greatest Conservation Need (SGCN)**

**State Status:** SC/M (Special Concern/Migratory Bird Protection) (2006)

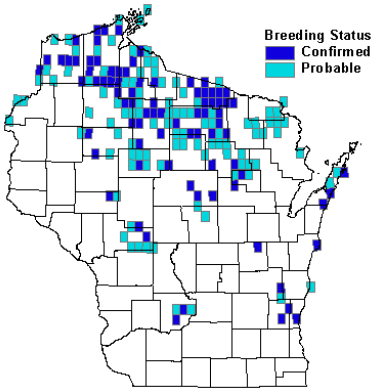
**State Rank:** S3S4B

**Federal Status:** none

**Global Rank:** G5

**Wildlife Action Plan Mean Risk Score:** 3.3

**Wildlife Action Plan Area of Importance Score:** 5




Canada Warbler Breeding Locations from Breeding Bird Atlas (Cutright et al. 2006)

Photo by Brian M. Collins

## Species Information

**General Description:** The Canada Warbler is approximately 14 cm (5.5 in) long, and has bluish-grey upperparts, bright yellow underparts, and white undertail coverts. All individuals have a yellow stripe in front of the eye and a complete white eye-ring that forms a pale spectacle. Adult males have a distinctive dark necklace of streaks across the upper breast, and black coloration that borders the yellow and gray portions of the head and extends down the neck. Adult females are similar to males but their plumage is duller and has less distinct black markings on the head and breast. Plumages are similar throughout the year. Immatures are similar to adults but their plumage is duller overall (Howell and Webb 1995, Dunn and Garrett 1997, Reitsma et al. 2010).

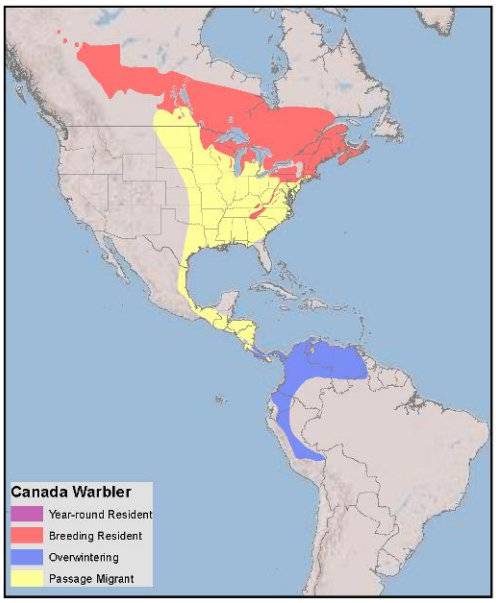
The Canada Warbler's song is composed of a chip followed by a distinctive pause, and then a series of short, sputtery notes: *chip chupety swee ditchety*. The song usually ends with a 3-note phrase. The call is a soft *chip* (Dunn and Garrett 1997, Reitsma et al. 2010). An example of a typical song can be heard here: <http://www.allaboutbirds.org/guide/canada_warbler/sounds>

**Definitive Identification:** The Canada Warbler's distinct facial markings, dark necklace, and lack of wingbars and tail spots help to distinguish it from other similar species.

**Similar Species:** The Kentucky Warbler's (*Geothlypis formosa*) plumage pattern is similar to that of the Canada Warbler but has olive upperparts, yellow undertail coverts, and lacks breast streaking and the Canada Warbler's complete white eye-ring (Dunn and Garrett 1997, Reitsma et al. 2010). In Wisconsin, Canada and Kentucky Warblers are more likely to co-occur during migration than during the breeding season.

**Associated Species:** Within appropriate mixed coniferous-deciduous forest types, depending on location, Canada Warblers could occur with the following Species of Greatest Conservation Need: Spruce Grouse (*Falcipennis canadensis*), Black-backed Woodpecker (*Picoides arcticus*), Least Flycatcher (*Empidonax minimus*), Olive-sided Flycatcher (*Contopus cooperi*), Boreal Chickadee (*Poecile hudsonicus*), Wood Thrush (*Hylocichla mustelina*), Veery (*Catharus fuscescens*), Rusty Blackbird (*Euphagus carolinus*), and Red Crossbill (*Loxia curvirostra*).

**State Distribution and Abundance:** The Canada Warbler generally breeds from Forest County west to St. Croix County, south to Marathon, northern Portage, and Menominee counties. This species also breeds locally in Door Peninsula, eastern Jackson County, the Baraboo Hills, Kettle Moraine State Forest, Cedarburg Bog, Jackson Marsh and scattered hardwood-conifer swamps in other central-Wisconsin counties. Highest concentrations occur in the northern tier of counties (Epstein 2006). Distribution information for this species may not reflect its full extent in Wisconsin, because many areas of the state have not been thoroughly surveyed.

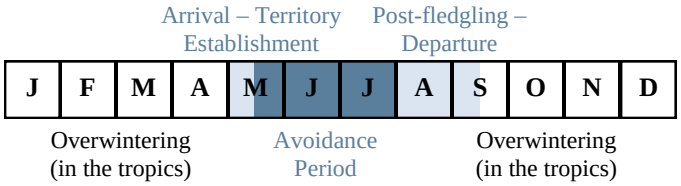



Global range map for Canada Warbler. (NatureServe 2013)

**Global Distribution and Abundance:** The Canada Warbler's summer range extends from eastern British Columbia eastward across southern Canada, the Great Lakes region, and the northeastern U.S. to the Atlantic Coast, and south into the Appalachian Mountains (Reitsma et al. 2010). Highest densities occur in east-central Saskatchewan, west-central Manitoba, northeastern Minnesota, and south-central Quebec (Sauer et al. 2008). The Canada Warbler's winter range extends primarily from Venezuela and Colombia south through eastern Ecuador to central Peru (Dunn and Garrett 1997, Reitsma et al. 2010).

**Diet:** Canada Warblers are primarily insectivorous, and prefer flying insects such as mosquitos and flies (*Diptera*), moths (*Lepidoptera*), and beetles (*Coleoptera*), as well as small spiders (*Araneae*; Reitsma et al. 2010).

**Reproductive Cycle:** Canada Warblers arrive in Wisconsin from early to late May, and late migrants sometimes continue to arrive in early June. Nest-building begins in late May and nestlings are present from mid-June to mid-July (Robbins 1991, Epstein 2006). This species departs Wisconsin from late July to mid-September (Robbins 1991, Epstein 2006, eBird 2011).




**Ecology:** The Canada Warbler nests and forages in the brushy understory of moist woodlands (Reitsma et al. 2010). Foraging typically occurs in thickets and branches within 5 m (15 ft) of the ground (Dunn and Garrett 1997, Reitsma et al. 2010). This species uses a variety of foraging techniques, including flycatching, sallying, and foliage gleaning. In northern Wisconsin, male and female Canada Warblers foraged more frequently in conifers than in deciduous trees (Sodhi and Paszkowski 1995).

In Wisconsin and elsewhere, this species nests in areas of dense vegetation, often with mosses, ferns, and decaying stumps or logs (Epstein 2006, Reitsma et al. 2010). Nests are located on or near the ground in earthen banks, mossy hummocks, or rotting tree stumps. Female Canada Warblers build bulky cup-nests composed of grasses, leaves, fibers, bark strips, moss, pine needles, and twigs (Dunn and Garrett 1997, Reitsma et al. 2010). Females typically lay and incubate 2-6 eggs, with an average clutch size of 4 (Reitsma et al. 2010). Incubation lasts 11-12 days, and chicks fledge approximately 8 days after hatching (Baicich and Harrison 1997, Reitsma et al. 2010). This species raises only one brood but may re-nest if the first attempt fails (Reitsma et al. 2010).

Canada Warblers are nocturnal migrants that fly more than 4000 km (2500 miles) from northeastern North America to northern South America (Reitsma et al. 2010). They leave their wintering grounds in the spring and move north through Central America, eastern Mexico, and south coastal Texas, and then continue on to their breeding grounds. They likely reverse this pattern during fall migration (Dunn and Garrett 1997).

**Natural Community Associations** (WDNR 2005, WDNR 2009):
*Significant*: boreal forest, forested ridge and swale, northern hardwood swamp, northern wet-mesic forest
*Moderate*: alder thicket, boreal rich fen, hemlock relict, northern dry-mesic forest, northern mesic forest, northern wet forest, pine relict, white pine-red maple swamp
*Minimal*: none

**Habitat:** The Canada Warbler breeds in moist, mixed coniferous-deciduous forests with a well-developed shrubby understory and lush ground layer (Mossman and Lange 1982, Epstein 2006). In Wisconsin, it favors swamps of northern white-cedar (*Thuja occidentalis*) and black ash (*Fraxinus nigra*); forests dominated by sugar maple (*Acer saccharum*), eastern hemlock (*Tsuga canadensis*), and yellow birch (*Betula allegheniensis*); spruce (*Picea* spp.) and balsam fir (*Abies balsamea*) forests; and alder (*Alnus* spp.) thickets (Epstein 2006). Sodhi and Paszkowski (1995) suggested that this species is strongly associated with conifers in northern Wisconsin. In a


Two sites where Canada Warbler has been documented in Wisconsin. Left photo is a northern hardwood swamp dominated by black ash. © Brian Collins. Right photo is a Douglas County stream bordered by conifers. Rich Staffen, Wisconsin DNR

disjunct population in southern Wisconsin, Mossman and Lange (1982) found an association with mountain maple (*Acer spicatum*) and beaked hazel (*Corylus cornuta*) growing under mature eastern white pine (*Pinus strobus*) or hemlock, and often located in natural canopy gaps caused by rocky or damp terrain.

The Canada Warbler commonly occurs throughout its range in areas with small streams, springs, or seepages (Epstein 2006, Hallworth et al. 2008) or in cool, moist ravines (Dunn and Garrett 1997). It tends to reach its highest densities in areas with low canopy height, high shrub density, and a structurally complex forest floor (Hallworth et al. 2008, Chace et al. 2009), but it also occurs in forests with large trees (e.g., Mossman and Lange 1982). These conditions occur naturally in swamp habitats and also in forest patches with canopies disturbed by ice storms, wind-throw, or insects (Hallworth et al. 2008). Certain forms of timber management, such as shelterwood and two-age harvesting, can also create these kinds of structural conditions favored by Canada Warblers (Hallworth et al. 2008).

**Threats:** The Canada Warbler is negatively impacted by any action that decreases shrub understory, including overbrowsing by deer (Matteson et al. 2009). The invasion of buckthorn (*Rhamnus* spp.) and other exotic shrubs into wet-mesic to dry-mesic habitats may threaten some Canada Warbler populations (especially in southern and central Wisconsin) because these species can replace native species and interfere with canopy replacement. In general, the absence of reliable regeneration techniques for important canopy species such as northern white-cedar, eastern hemlock, and eastern white pine is a concern (WDNR 2005). Forest management practices that reduce overall conifer cover may decrease site suitability for this species. Loss and fragmentation of northern forests through residential development, road building, and habitat conversion are significant threats (WDNR 2005, Matteson et al. 2009). Habitat loss and degradation on the wintering grounds, particularly in the mid-elevation tropical forests of the eastern Andes Mountains, may also significantly contribute to its observed long-term decline (WDNR 2005).

**Climate Change Impacts:** The Canada Warbler is highly vulnerable to projected climate change in Wisconsin, because warmer, drier conditions predicted by climate change models will result in regeneration failure – as well as seedling and adult mortality – of nearly all tree species favored by Canada Warbler (see "Habitat" section; Swanston et al. 2011). Many boreal and northern hardwood tree species are expected to shift their range northward out of Wisconsin (WICCI 2011). Based on these projections, Canada Warblers would be expected to exhibit a northward distribution shift to match these habitat changes. Potential climate-change impacts at the continental level include decreased abundance and range contraction driven by predicted losses of balsam fir and yellow birch (Matthews et al. 2004).

**Survey Guidelines:** Area searches are effective for surveying Canada Warblers in forest stands < 100 acres. Survey the entire affected area that contains suitable Canada Warbler nesting habitat (see "Habitat" section), by walking slowly throughout the area and stopping occasionally to listen for Canada Warbler vocalizations. Point counts can be used for stands > 100 acres, and require that the observer stand in one spot for 10 minutes and record all birds seen or heard within a 100 m (330 ft) radius. Point-count stations should be placed a minimum of 250 m (820 ft) apart. For either the area-search or point-count method, record the following data: all Canada Warblers seen or heard, numbers of pairs and juveniles, behavioral observations such as courtship displays or food carries, and other Species of Greatest Conservation Need that are present at the site. Whenever possible, also map the approximate territory boundaries.

Carry out surveys between May 25 and July 15, preferably 10 days apart, and including at least one survey less than one week prior to any proposed project activity that may impact Canada Warblers (see *Screening Procedures*). Begin surveys within 15 minutes of sunrise and complete them within four hours, or no later than 10 am. Conduct surveys during appropriate weather (i.e., no fog, rain, or wind > 10 mph; Ralph et al. 1993). Personnel conducting surveys must be able to identify Canada Warblers by sight and sound. At least three surveys conducted with the above protocol and yielding negative results are needed to determine that the species is not present at a site for the purposes of these guidelines.

Summarize results, including survey dates, times, weather conditions, number of detections, detection locations, and behavioral data and submit via the WDNR online report: <http://dnr.wi.gov, keyword "rare animal field report form">.

## Management Guidelines

*The following guidelines typically describe actions that will help maintain or enhance habitat for the species. These actions are not mandatory unless required by a permit, authorization or approval.*

Canada Warbler conservation in Wisconsin requires protection, restoration, and management of moist mixed coniferous-deciduous forests within appropriate ecological landscapes, including central Lake Michigan coastal, forest transition, north central forest, northeast sands, northern highland, northern Lake Michigan coastal, northwest lowlands, and Superior coastal plain (WDNR 2005). Within these landscapes, good examples of Canada Warbler habitat can be found at the Upper Brule River in Douglas County, Miscauno Cedar Swamp in Marinette County, St. Croix Ash Swamp in Burnett County (Hoffman and Mossman 1993), Meyers Beach Mainland Sea Caves Trail in Bayfield County, and along the Namekagon River in Washburn County.

Suitable breeding habitat for Canada Warbler has the following components: 1) moist, mixed coniferous-deciduous forest, 2) patches of dense understory of shrubs and ferns, and 3) structurally complex forest floor. Forest managers should strive for structural complexity and maintaining both the hardwood and softwood components of mixed stands, where possible, for this species. Increase overall site suitability for this species by promoting a dense understory and well-developed ground cover within dry-mesic to wet-mesic forest types. In managed stands with a minimal understory shrub layer, timber harvesting techniques that result in canopy gaps (e.g., group selection harvests) can increase the understory shrub layer. Shelterwood harvests and other two-age systems can also create the needed structural composition for the Canada Warbler. In places where maintaining aspen is the primary objective, retaining many trees of other species during harvest, particularly conifers, might improve future conditions for this species.

Deer browse can reduce understory and severely limit habitat in some areas. Browse-resistant species, such as balsam fir, play an important role in providing vegetation in the greater than one meter (> 3 ft) height range that is typically removed by browsing (Matteson et al. 2009). Consideration should be given to lowering deer densities or otherwise protecting habitats from browse.

## Screening Procedures

*The following procedures should be followed by DNR staff reviewing proposed projects for potential impacts to the species.*

Although the Canada Warbler is listed as a species of special concern and included in the Natural Heritage Inventory (NHI) database, it is not formally tracked by NHI at this time. Because occurrences for this species are not available to NHI data users, direct observations or other non-NHI data sources would be needed to determine species presence or likelihood of presence. Please see the *Avoidance Measures* (below) if you believe Canada Warbler is present where you are working. Note that some users of this document may choose to assume presence based on habitat and location.

## Avoidance Measures

*The following measures are specific actions required by DNR to avoid take (mortality) of state threatened or endangered species per Wisconsin's Endangered Species law (s. 29.604, Wis. Stats.) These guidelines are typically not mandatory for non-listed species (e.g., special concern species) unless required by a permit, authorization or approval.*

Canada Warblers are protected by the Federal Migratory Bird Treaty Act of 1918, which established a prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention . . . for the protection of migratory birds . . . or any part, nest, or egg of any such bird." (16 U.S.C. 703). Contact the US Fish and Wildlife Service directly for any permits related to the Federal Migratory Bird Treaty Act (see *Contact Information*).

If *Screening Procedures* above indicate that avoidance measures are required for a project, follow the measures below. If you have not yet read through *Screening Procedures*, please review them first to determine if avoidance measures are necessary for the project.

1. The simplest and preferred method to avoid take of Canada Warblers is to avoid directly impacting individuals, known Canada Warbler locations, or areas of suitable habitat (described above in the "Habitat" section and in *Screening Procedures*).

2. If Canada Warbler impacts cannot be avoided entirely, avoid impacts during the **breeding season (May 15 to August 1)**.

3. If Canada Warbler impacts cannot be avoided, please contact the DNR species expert (see *Contact Information*) to discuss possible project-specific avoidance measures.

## Additional Information

**References**

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**Linked Websites:**

- Cornell Lab of Ornithology All About the Birds: <http://www.allaboutbirds.org/guide/Canada_Warbler/id>
- Natural Communities of Wisconsin: <http://dnr.wi.gov, key word "natural communities">
- Rare Animal Field Report Form: <http://dnr.wi.gov, key word "rare animal field report form">
- Wisconsin Bird Conservation Initiative All Bird Conservation Plan: <http://www.wisconsinbirds.org/plan/species/cawa.htm>
- Wisconsin Wildlife Action Plan: <http://dnr.wi.gov, key word "Wildlife Action Plan">
- Wisconsin Endangered and Threatened Species: <http://dnr.wi.gov, key word "endangered resources">
- Wisconsin Natural Heritage Inventory Working List Key: <http://dnr.wi.gov, key word "Natural Heritage Working List">

**Funding**

- Natural Resources Foundation of Wisconsin: <http://www.wisconservation.org/>
- USFWS State Wildlife Grants Program: <http://wsfrprograms.fws.gov/subpages/grantprograms/swg/swg.htm>
- Wisconsin Natural Heritage Conservation Fund
- Wisconsin DNR Division of Forestry

**Contact Information (Wisconsin Species Expert for Canada Warbler)**

- Mike Mossman, WI Department of Natural Resources, Bureau of Integrated Science Services (608-221-6346, michael.mossman@wi.gov)

**Contact Information (Federal Migratory Bird Treaty Permits or Questions)**

- Larry Harrison, U.S. Fish and Wildlife Service, 5600 American Blvd. West, Suite 990, Bloomington, MN 55437-1458 (612-713-5489, Larry_Harrison@fws.gov)
  - See also <http://www.fws.gov/migratorybirds/mbpermits.html>

**Endangered Resources Review Program Contacts**

- General information (608-264-6057, DNRERReview@wisconsin.gov)

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