Cape May Warbler

Dendroica tigrina

Original prepared by John M. Cooper and Suzanne M. Beauchesne

Species Information

Taxonomy

The Cape May Warbler is one of 12 species of warbler in the genus *Dendroica* that breed in British Columbia (Campbell et al. 2001). It may be most closely related to the Blackpoll (*Dendroica striata*) and Bay-breasted Warblers (*Dendroica castanea*), based on morphology, behaviour, and ecology (Baltz and Latta 1998). No subspecies of Cape May Warbler are recognized (AOU 1957; Cannings 1998).

Description

The Cape May Warbler is a small (~13 cm in length) songbird. In the breeding season, the male has a chestnut ear patch bordered by a distinct yellow hindneck and throat, an indistinct black eye stripe, and an olive crown and nape, heavily streaked with black. The upperparts are predominantly olive with some black streaking, white wing patch, and a yellow rump. The underparts are yellow with bold black streaking on the breast. The breeding female is similar but significantly duller in colour, the wing patch is replaced by a narrow white wing bar, and the chestnut ear patch is lacking. Immature birds are duller still (Pyle 1997).

Distribution

Global

The Cape May Warbler breeds from the south-western Northwest Territories and northeastern British Columbia, across Canada east to Nova Scotia, and in the northern United States from the Great Lakes east to Maine (Godfrey 1986). Local and regional breeding distributions and populations are influenced by outbreaks of eastern spruce budworm (*Choristoneura fumiferana*) (Kendeigh 1947; MacArthur 1958; Morse 1978). It winters primarily in the West Indies, although a few have also been found in Central America and northern South America (AOU 1983; Baltz and Latta 1998).

British Columbia

The Cape May Warbler occurs almost exclusively in the Taiga Plains and Boreal Plains ecoprovinces. Most records are from a small area near Dawson Creek, Pouce Coupe, and Tupper, in the Boreal Plains with another cluster of reports coming from the Fort Nelson Lowland in the Taiga Plains (Siddle et al. 1991; Enns and Siddle 1992). There is evidence of breeding in both areas (Siddle et al. 1991).

Forest regions and districts

Northern Interior: Fort Nelson, Peace

Ecoprovinces and ecosections

TAP: FNL, MUP

BOP: KIP, HAP, PEL

Biogeoclimatic units

BWBS: mw1, mw2

Broad ecosystem units

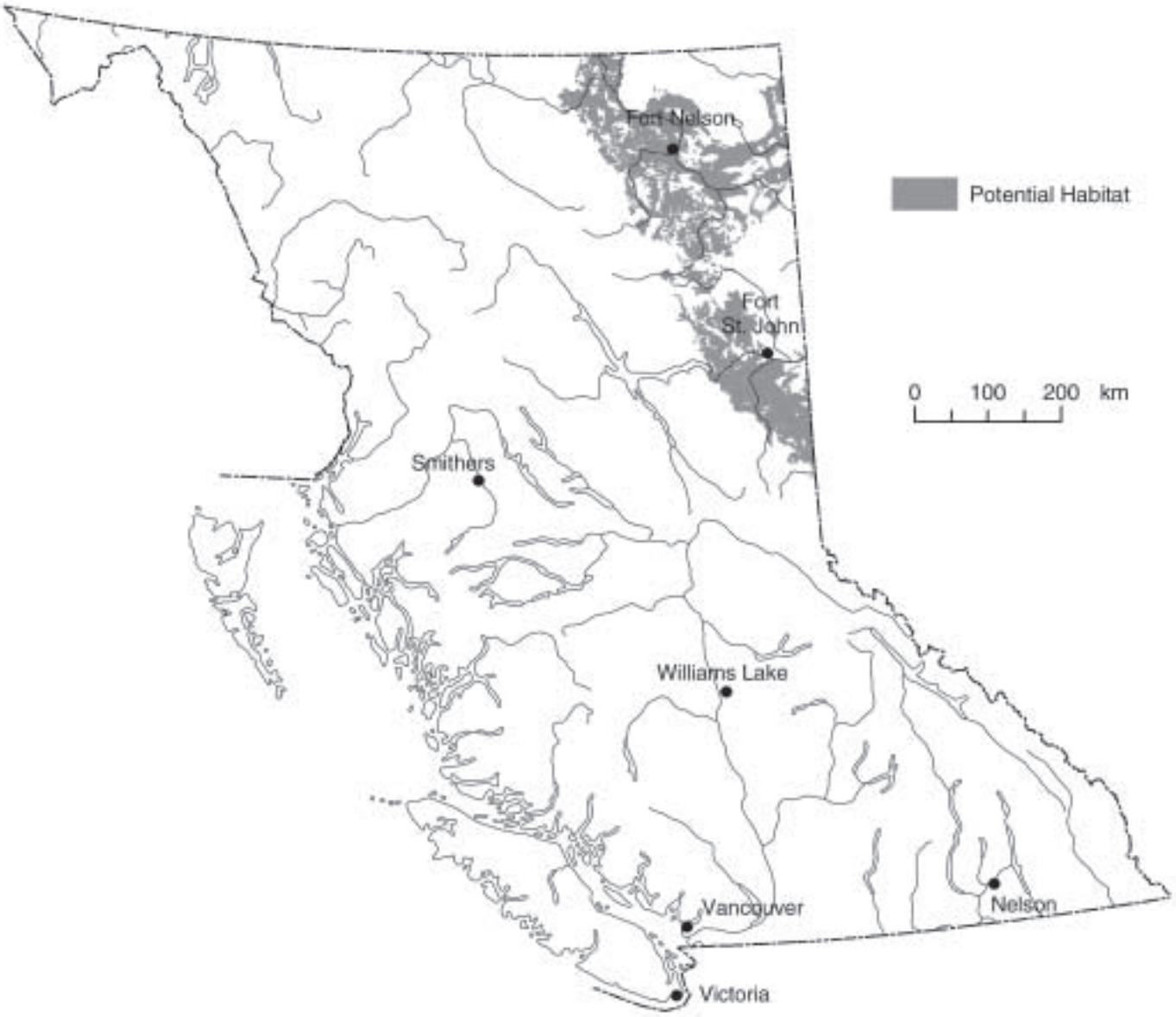
BA, PR

Elevation

Breeding: 420–660 m (Bennett and Enns 1996, Campbell et al. 2001)

Migration: 230–760 m (Campbell et al. 2001)

Cape May Warbler
(Dendroica tigrina)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several ecosystem classifications (Ecoregion, Biogeoclimatic and Broad Ecosystem Inventory) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated.

Life History

Very little is known about the ecology of the Cape May Warbler in British Columbia, and many details are lacking from elsewhere in its range. Most of the following information is inferred from studies in other areas.

Diet and foraging behaviour

During the breeding season, the Cape May Warbler is a spruce budworm specialist (Crawford and Jennings 1989; Baltz and Latta 1998). It feeds mainly by gleaning prey from tree foliage, primarily along branches, but also hawks, hovers, or fly-catches (Morse 1978; Baltz and Latta 1998). In British Columbia, as reported elsewhere, most foraging is done within the upper canopy (MacArthur 1958; Enns and Siddle 1992). This warbler also opportunistically takes advantage of a variety of small adult and larval insects, spiders, eggs, of spiders and insects, as well as berries, and seeds (Bent 1953; Morse 1978; Sealy 1989). Nectar, pollen, and tree sap are important food sources during spring migration (Bent 1953; Sealy 1989). In the winter, the Cape May Warbler may feed mainly on nectar, although invertebrates are also taken, if available (Terborgh 1989; Baltz and Latta 1998).

Reproduction

There is no information on pair formation. The female alone builds the nest (Baltz and Latta 1998). Nests are bulky cups of grass, small twigs, and moss lined with hair, feathers, and fur (Baicich and Harrison 1997). Clutch size ranges from four to nine eggs and is strongly influenced by food supply, with larger clutches typical during periods of high food abundance (Bent 1953, Morse 1978, 1989). In northeastern British Columbia, egg laying probably begins in mid- to late June (Cooper et al. 1997). Incubation, by the female alone, is for an unknown period, although 11–13 days is likely, based on the incubation period of other members of this genus. The nestling period is also unknown, but is probably between 9 and 12 days, also based on other congeneric warblers. Nestlings are likely present from late June through mid-July in northeastern British Columbia (Campbell et al. 2001). Both parents feed nestlings (Baltz and Latta 1998). A pair probably raises a single brood each year in British Columbia, a widespread pattern in warblers (Morse 1989; Baltz and Latta 1998). There are no data for Cape May Warblers on hatching success, survival of nestlings, or fledging success; however, through increased clutch sizes, Cape May Warblers are undoubtedly able to produce more young in years and regions with high food supplies (Baltz and Latta 1998).

Site fidelity

Cape May Warblers are known to respond dramatically, in breeding distribution and population size, to changes in abundance of spruce budworms (Kendeigh 1947; MacArthur 1958; Morse 1978; Saunders et al. 1985; Welsh 1987; Morse 1989), a correlation that has been noted in British Columbia (Bennett and Enns 1996; Cooper et al. 1997). They may become super-abundant during infestations and then decline or disappear entirely from an area within a few years after the outbreak (Baltz and Latta 1998). Thus, site fidelity is likely low.

Home range/territory size

There are no data on territory size for British Columbia; however, an average territory size of 0.4 ha/pair has been recorded in Ontario (Kendeigh 1947). Local densities in northeastern British Columbia have ranged from about 0.1 to 0.5 pairs/ha (Bennett et al. 2000). In Ontario, densities fluctuated dramatically, from 370 pairs/km^2 in the early 1980s to almost none in 1986, in response to a spruce budworm infestation and subsequent decline (Baltz and Latta 1998).

Dispersal and movements

The Cape May Warbler is a neotropical migrant songbird and one of the first warblers to arrive in Canada in spring and last to leave in late summer (Francis and Cooke 1986). During spring migration, males arrive slightly earlier than females, a general pattern in many neotropical migrants (Francis and Cooke 1986). Spring migrants begin arriving in northeastern British Columbia in mid-May with most probably arriving in late May and early June (Siddle et al. 1991; Campbell et al. 2001).

After nesting is completed, adults probably begin to migrate south in mid- to late July followed by juveniles in August although the fall movement is difficult to discern because of small populations (Campbell et al. 2001). Cape May Warblers occur regularly in northeast British Columbia between 19 May and 21 August; however, there is a late record of 22 October at Prince George (Campbell et al. 2001).

Habitat

Structural stage[1]

6: mature forest (80–140 years)
7: old forest (>140 years)

Important habitats and habitat features

Nesting

Throughout its range, the Cape May Warbler relies mainly on mature to old, coniferous-dominated forests for nesting habitat (B.C.: Bennett et al. 2000, Bennett and Enns 1996; Alberta: Semenchuk 1992; Ontario: Welsh 1987; general: Baltz and Latta 1998). In northeastern British Columbia, Cape May Warblers are found almost exclusively in mature white spruce (*Picea glauca*) forest, either pure stands or mixed with balsam poplar (*Populus balsamifera*), aspens (*Populus tremuloides*), birch (*Betula papyrifera*), willow (*Salix* spp.), alder (*Alnus rubra*), and lodgepole pine (*Pinus contorta*) (McTaggart-Cowan 1939; Siddle et al. 1991; Enns and Siddle 1992). Very few data are vailable on the use of different successional stages by Cape May Warblers, although one study in Maine found no use of early or mid-seral stages (Titterington et al. 1979). The effects of forest fragmentation or selective logging are not well known. However, Enns and Siddle (1992) found this warbler in selectively logged stands in the northeast and use of spruce in over-grown pastures in Maine has been documented (Palmer 1949), suggesting some tolerance for thinning of forests.

Only one nest has been found in British Columbia (Campbell et al. 2001). Elsewhere, Cape May Warblers nest in coniferous (mainly spruce) trees, 10–20 m above ground. Nests are placed on a horizontal branch, often near the trunk, on the short branches at the top (Bent 1953; Baicich and Harrison 1997).

Some common characteristics of Cape May Warbler habitat in British Columbia include tall stands of white spruce that are fairly dense but have frequent openings. Relatively tall conifers, extending above the main canopy, are used by males as singing perches and are, apparently, important nesting habitat components (Baltz and Latta 1998). Sites are usually on flat ground with an open, mossy (*Dicranum* spp., *Pleurozium* spp., *Rhytidiopsus* spp.) ground cover and understorey plants include highbush cranberry (*Viburnum edule*), horsetail (*Equisetum* spp.), bunchberry (*Cornus canadensis)*, palmate coltsfoot (*Petasites frigidus* var. *palmatus*), twinflower (*Linnea borealis*), and willow (Cooper et al. 1997).

An abundant prey base is an also essential breeding season resource feature. Breeding distribution and abundance are strongly tied to presence of spruce budworm (MacArthur 1958; Morse 1978; Welsh 1987; Morse 1989).

Foraging

Birds probably forage mainly within the nesting habitat; therefore, feeding and nesting habitat requirements are the same.

Conservation and Management

Status

The Cape May Warbler is on the provincial *Red List* in British Columbia. Its status in Canada has not been determined (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

BC	AB	NWT	Canada	Global
S2B, S2N	S2B	S?	N5B	G5

1 Suitability increases with age.

Trends

Population trends

There are no data on population trends for Cape May Warblers in British Columbia, although some authors believe all northeastern warblers are in decline (Siddle et al. 1991; Siddle 1992). The Cape May Warbler was first documented in British Columbia in 1938 when a single bird was collected during fieldwork in the Peace Lowland (McTaggart-Cowan 1939). It was not recorded again until 1971 and has only been infrequently documented since. For example, only one bird was recorded from the Fort Nelson Lowland during two summers fieldwork in the mid-1970s (Erskine and Davidson 1976) and one bird was found during 1 month of fieldwork in 1982 near Kwokullie Lake (Cooper et al. 1997). More recently, the Cape May Warbler was considered one of the least abundant warblers in northeastern British Columbia (Enns and Siddle 1992; Siddle 1992). Lance and Phinney (1994) found no individuals during their study south of Dawson Creek in mixedwood forest, results that reinforce the relationship between Cape May Warblers and mature white spruce stands. In the late 1990s, however, Cape May Warblers were relatively more common at several sites in the northeast (Bennett et al. 2000). The Cape May Warbler is very sparsely and locally distributed in northern Alberta according to recent atlas surveys (Semenchuk 1992); few data indicate that its long-term population status is different in British Columbia.

In eastern North America, Breeding Bird Surveys reveal no significant long-term population trends for Cape May Warbler (1966–1988, Robbins et al. 1989, Hagan and Johnston 1992), or Canada (Environment Canada 2001). A constant-effort mist-netting program in Massachusetts found a significant long-term (1970–1988) decline in migrating populations, as did an analysis of 53 years (1937–1989) of field notes from eastern Massachusetts (Hill and Hagan 1991; Hagan and Johnston 1992). Local declines in some Caribbean wintering areas have also been documented (Hagan and Johnston 1992).

Based on the widespread population declines experienced by many neotropical migrants (Morton and Greenberg 1989; Terborgh 1989, Finch 1991), and because of the limited number of records of Cape May Warblers from British Columbia, a species that relies on a habitat in decline, it is probable that populations are stable or decreasing, and improbable that populations are increasing (Cooper et al. 1997).

Habitat trends

Mature to old-growth, spruce-dominated forests, the preferred habitat of Cape May Warbler, are relatively rare in the northeast. Because of the high commercial value of large spruce, it is inevitable that most accessible stands will be harvested (MOF 1994), and that most high quality Cape May Warbler habitat in British Columbia will eventually be lost.

Cape May Warblers have been observed in selectively logged stands; however, these areas had access roads suggesting that they may be further thinned or cleared in the future (Enns and Siddle 1992). The extent to which mature forest may be thinned and still provide suitable habitat for Cape May Warblers has yet to be determined (Cooper et al. 1997).

Threats

Population threats

Nest parasitism by Brown-headed Cowbirds (*Molothrus ater*) can severely impact neotropical migrant songbird populations (Brittingham and Temple 1983; Askins et al. 1990; Finch and Stangel 1993). In British Columbia, there is a single record of a recently fledged Brown-headed Cowbird being fed by an adult Cape May Warbler (Siddle 1992). Elsewhere, parasitism of Cape May Warblers has only infrequently been reported (Friedmann 1963; Baltz and Latta 1998). However, although it is unlikely that cowbird parasitism is a major factor in British Columbia at present, the lack of parasitism on this species is undoubtedly related to the fact that it typically breeds in boreal forests away from cowbird concentrations and the lack of nest observations. Therefore, it is likely that the rate of parasitism will increase with increasing fragmentation of northeastern forests (Cooper et al. 1997).

Forest fragmentation also increases edge habitat favoured by predatory species such as jays, crows, and magpies. Although there is only limited data for predation on Cape May Warblers, all forest songbirds face greater predation intensity as forests are cleared (Wilcove 1985; Yahner and Scott 1988; Askins et al. 1990).

Migration is typically the period of highest mortality for both adult and juvenile warblers. Cape May Warblers are particularly vulnerable to storms because their migratory path includes a considerable distance over water. Collision with light towers also kills hundreds of migrating Cape May Warblers annually in the eastern United States (Baltz and Latta 1998). Historical aerial spraying practices for spruce budworm were fatal for large numbers of warblers on the breeding ground (Pearce et al. 1979). Band return data also suggest that many are killed by domestic cats, and shot on the winter ground (Baltz and Latta 1998).

Habitat threats

The primary threat to the Cape May Warbler in British Columbia is the harvesting of mature to old-growth white spruce dominated stands within its restricted range in the Boreal Plains and Taiga Plains ecoprovinces. Loss or deterioration of forest habitat has been widely blamed for declines in breeding populations of many forest warbler species (Titterington et al. 1979; Burgess and Sharpe [editors] 1981; Askins and Philbrick 1987; Terborgh 1989; Hagan and Johnston 1992; Maurer and Heywood 1993). There is no evidence to suggest that the Cape May Warbler will respond differently (Cooper et al. 1997).

Habitat is also lost or fragmented by other activities such as clearing for agriculture, road building, transmission lines, and oil and gas exploration (Cooper et al. 1997).

Once harvested, it is estimated that clearcuts will require >100 years to regenerate to a stage suitable for Cape May Warblers (Cooper et al. 1997). In the northeast, the general forest management trend toward intensive silviculture for shorter rotations (Peterson et al. 1989) precludes regeneration of the highest quality nesting habitat (old growth >140 years) after a block has been harvested. In some tree farm licences (e.g., TFL 48 in Dawson Creek Forest District), the percentage of old-growth coniferous forests may be increasing as fire suppression reduces large-scale fire disturbances and younger stands continue to age faster than old-growth stands are logged or burned (A. de Vries, pers. comm.).

Large-scale spraying of insecticides, to control budworm outbreaks in coniferous forest habitat, inevitably reduces insect prey base (Freedman et al. 1981; Cooper et al. 1997; Baltz and Latta 1998).

The Cape May Warbler may be somewhat less affected than many other neotropical migrants by deforestation of tropical regions because this species uses a broad range of winter habitats where it is a foraging generalist (Baltz and Latta 1998). However, there is cause for concern for any species with a concentration of migrants from a huge breeding distribution funnelled into a relatively small winter range (Keast and Morton 1980). Therefore, Cape May Warbler populations are considered highly vulnerable to tropical deforestation in the main wintering range in the Bahamas and Greater Antilles (Terborgh 1989; Hagan and Johnston 1992; Rappole 1995). This may be important because it is usually populations at the edge of a species range, as in British Columbia, that are the first to decline when overall numbers decline (Wilcove and Terborgh 1984).

Legal Protection and Habitat Conservation

The Cape May Warbler, its nests, and its eggs are protected from direct persecution in Canada by the *Migratory Birds Convention Act*. In British Columbia, the same are protected under the provincial *Wildlife Act*.

Several Class A parks, ecological reserves, recreation areas, and proposed protected areas are within the range of the Cape May Warbler, although none include significant amounts of old-growth white spruce forest. Most nesting habitat is on Crown land; therefore, habitat conservation may be partially addressed by the old forest retention targets (old

growth management areas), riparian reserves, and wildlife tree retention (WTR) areas in the results based code.

Since Cape May and Bay-breasted Warblers use similar habitats, areas (i.e., WHAs, OGMAs, WTR areas) established for one species will likely be useful for the other.

Identified Wildlife Provisions

Habitat management for this species is best conducted at the landscape level. Because populations are very local, are dispersed in a large geographic area, and respond so directly to prey availability, old growth management areas, riparian management areas, and protected areas scattered throughout the BWBS may be the best approach to managing habitat for this species.

Sustainable resource management and planning recommendations

- Maintain suitable nesting habitat. Consider greater old forest retention in forests with abundant large-stem spruce trees and recorded concentrations of Cape May Warblers.
- Incorporate old spruce into (1) old growth management areas (OGMAs); (2) areas constrained for other management objectives (e.g., visual quality, recreation, ungulate winter range, terrain concerns); or (3) stand level reserves such as wildlife tree retention areas and riparian management areas. Areas selected should include spruce forests with evidence of declining health for potential future spruce budworm outbreaks. Other characteristics of good habitat are stands of old-growth black or white spruce >140 years, flat topography, and open moss-dominated understoreys.
- Plan rotation age to ensure sufficient mature and old forest is maintained.
- Consider wildlife tree and old forest retention objectives for this species in the BWBSmw1 and BWBSmw2 in Fort Nelson and Peace forest districts. Blocks should be assessed to identify potentially suitable WTR areas. The following attributes should be used to design suitable WTR areas or OGMAs for this species (Table 1).
- Restrict salvage or harvest and avoid insecticide use.
- Maintain WTR area over the long term.

Table 1. Preferred WTR area characteristics for the Cape May Warbler

Attributes	Characteristics
Size (ha)	≥5 ha; larger are preferred
Location	BWBSmw1, BWBSmw2; flat topography
Features	open moss-dominated understoreys
Tree species	white spruce; coniferous species preferred
Age/structure	>140 years; structural stage >6

Wildlife habitat area

Goal

Although this species is likely best managed at the landscape level, where landscape level planning objectives cannot address critical areas for these species, then it may be appropriate to establish WHAs.

Feature

Establish WHAs only within highly suitable nesting habitat (i.e., in mature or old spruce forest) where concentrations (>3 pairs/10 ha) of Cape May Warblers regularly occur.

Size

Typically between 10 and 30 ha but will depend on site-specific factors.

Design

WHAs should include old spruce forest on flat topography with open moss-dominated understoreys. Minimize edge habitat wherever possible.

General wildlife measure

Goals

1. Ensure WHA is windfirm.
2. Maximize interior forest conditions.
3. Minimize disturbance during the nesting season (1 June to 15 July).

Measures

Access

- Do not construct roads, trails, or other access routes.

Harvesting and silviculture

- Do not harvest.

Pesticides

- Do not use pesticides.

Additional Management Considerations

Avoid prime Cape May Warbler habitat when planning seismic explorations, transmission lines, and other access routes.

Information Needs

1. Distribution.
2. Habitat use preferences.
3. Population estimates and trends.

Cross References

Bay-breasted Warbler, Black-throated Green Warbler

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