

TOWNSEND'S WARBLER

TAXONOMY

Scientific name: *Dendroica townsendi* (Townsend, 1837)

Common name: Townsend's Warbler

Family: Parulidae

Taxonomic comments: Constitutes a superspecies with *D. occidentalis*, *D. virens*, and *D. chrysoparia* (AOU 1998). A sister species of *D. occidentalis* and hybridizes with it commonly where their ranges meet (AOU 1998, Rohwer and Wood 1998, Sibley 2001). The hybrid zone between the two species is narrow and moving, with *D. townsendi* replacing *D. occidentalis* (Rohwer and Wood 1998, Pearson and Rohwer 1998, Pearson and Manuwal 2000). Several instances of hybridization between Townsend's and Black-throated Gray Warblers (*D. nigrescens*) also reported (Wright et al. 1998).



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No subspecies currently recognized. Although considered monotypic, morphological differences suggest two distinct subspecies (Grinnell 1905, Morrison 1983). The population that winters in Oregon and California can be separated from the population wintering in Mexico and Central America by wing length; although these populations formally satisfy the designation as subspecies, they have not been formally designated as such (Morrison 1983, Pogson et al. 1997). Grinnell (1905) found the population wintering along the Pacific Coast and breeding in Southeast Alaska and coastal British Columbia had shorter wing chords than birds wintering from northern Mexico to Costa Rica and breeding in the interior western U.S. Morrison (1983) found a similar pattern, but grouped specimens from Southeast Alaska with longer-winged birds wintering south of the U.S.

DESCRIPTION

Basic description: A medium-sized wood-warbler.

General description:

A medium-sized wood-warbler with a short pointed bill, bright yellow foreparts, olive cheeks, and streaked flanks (Sibley 2003). Breeding male is distinctive with bright yellow stripes bordering black cheek-patch. Adult female generally has duller markings and coloration. Adult male median wing-converts broadly tipped white, immature male and all female feathers show black shaft-streak (Wright et al. 1998).

Diagnostic characteristics:

Adult male easily distinguished from other warblers in western U.S. Adult female and immature resemble Black-throated Green Warbler (*Dendroica virens*), but Townsend's has distinctive olive cheek-patch and lacks yellow wash on vent. Hybrids between Townsend's and Hermit Warbler (*D. occidentalis*) not uncommon; resemble Hermit but with yellow face, sometimes confused with Black-throated Green Warbler (Wright et al. 1998).

Length (cm): 13

Weight (g): 9

Reproduction:

In southcentral Alaska, breeds from mid-May through early June (Wright et al. 1998). Clutch size likely varies with latitude; clutches in Alaska are larger (5-7 eggs) than reported elsewhere in the U.S. (usually 3-5 eggs; Mannan et al. 1983, Matsuoka et al. 1997a). One brood per year; earliest egg date 24 May in Washington (Jewett et al. 1953); latest egg date 1 July in Alaska (Wright et al. 1998). In southcentral Alaska, most clutches initiated 25 May-4 June (Matsuoka et al. 1997a). Female broods young, male may feed young (Wright et al. 1998). Incubation lasts 11-14 days; fledges at 9-11 days following hatch, generally mid-June to early July (Mannan et al. 1983, Matsuoka et al. 1997a). Lifespan unknown, but at least three years (Wright et al. 1998).

Ecology:

A common, but lesser known wood-warbler; breeds among tops of firs in the Pacific Northwest (Sprunt 1957). Very closely related to the Black-throated Green Warbler (common in eastern U.S.) and Hermit Warbler (common in western U.S.) (Sibley 2001, Sibley 2003). Ranges of Hermit and Townsend's Warblers overlap in Washington and Oregon; frequently hybridize (Pearson 1997). Brood parasitism by the Brown-headed Cowbird (*Molothrus ater*) has been recorded in British Columbia (Friedmann et al. 1977). Larval bird blowflies are common nest parasites; in southcentral Alaska, 55% of 20 nests with nestlings and 50% of 14 nests fledging young were infested (Matsuoka et al. 1997a). Boreal Owls (*Aegolius funereus*) are major egg and nest predators (Wright et al. 1998).

Migration:

Medium- to long-distance migrant; winters in neotropics. Small numbers in mixed-species flocks typical (Wright et al. 1998). Two distinct groups of migrants; those that winter in California and Oregon and breed in the Queen Charlotte Islands, and those that breed in Alaska, western Canada, and northwestern U.S. and winter in southern North America and Central America (Wright et al. 1998). Migrate northward in spring through the southwestern deserts, then farther north along mountain ranges and valleys that are oriented north-south (Sibley 2003). Many arrive in nesting areas in Pacific Northwest from April to May (Bent 1953). Migrants arrive in southern California during the second week of April, and then move through in waves (Pogson et al. 1997). Arrive in Washington from late April to early May (Bent 1953); in southeastern Alaska as early as April; reach central Alaskan breeding grounds by mid-May (Pogson et al. 1997). Remain in interior Alaska until late August; in Southeast Alaska until September (Johnson 2003).

Arrive on southern wintering range late September; depart by early April (Stiles and Skutch 1989).

Food:

Feeds mostly on insects (e.g., weevils, bugs, leafhoppers, caterpillars, etc.) and spiders gleaned from foliage on breeding grounds (Wright et al. 1998). Winter: gleans small insects and caterpillars in foliage at all heights, occasionally hovers and plucks them from undersides of leaves; hawks flying insects (Stiles and Skutch 1989).

Phenology: Diurnal

Habitat:

Breeding: Relies on mature, tall coniferous and mixed coniferous-deciduous forest across its breeding range (Rohwer 1994, Hejl et al. 1995). Most abundant in unlogged old-growth forest, but also found in late successional stages (Kessler and Kogut 1985, Wetmore et al. 1985, Tobalske et al. 1991, Cotter 2005). Nests almost exclusively in coniferous trees (Matsuoka et al. 1997b); may nest 2.7-4.5 m above ground, maybe higher (Terres 1980). Few nests have been found.

Non-breeding: Winters in higher elevation humid forests, including pine-oak and cloud forests; also highlands in disturbed forest, edges, and clearings (Stiles and Skutch 1989). Along western U.S. coast, winters where minimum January temperature averages above freezing (Wright et al. 1998). Mexican and Central American winter range is montane forest including mature and secondary forests, tree plantations, and ecotones (Wright et al. 1998).

Foraging: Forages high in mature coniferous trees (Sibley 2003). Will also forage in other strata such as smaller conifers, deciduous understory trees, and shrubs (Bent 1953, Gabrielson and Lincoln 1959, Mannan and Meslow 1984, Matsuoka et al. 1997b).

Alaska habitat:

Prefers mature and old-growth forests with large (≥ 150 year old) conifers. Nests almost exclusively in coniferous trees (Matsuoka et al. 1997b, Wright et al. 1998) with selection of breeding territories more closely associated with selection of nest sites than selection of foraging sites (Matsuoka et al. 1997b, BPIF 1999). In southcentral and central Alaska, found in boreal forest dominated by white spruce (*Picea glauca*; Spindler and Kessel 1980, Matsuoka et al. 1997a). Territories are also selected in areas with low densities of alder and steep-sided slopes, the former potentially lowering the risk of nestling infestation by bird blow flies (Matsuoka et al. 1997b). Found in forests dominated by western hemlock (*Tsuga heterophylla*) and Sitka spruce (*Picea sitchensis*) in southeastern and parts of southcentral Alaska. Breeding densities were highest in unharvested, old-growth stands among coastline forests of Southeast Alaska; also common in strips of coastal forest retained as beach buffers of various widths during timber harvest (Kissling 2003).

STATUS

Global rank: G5 (12Mar1996)

Global rank reasons:

Secure – widespread and abundant.

State rank: S5B (26May2006)

State rank reasons:

Fairly wide-ranging in coastal and boreal forested regions of eastern interior, southcentral, and southeastern Alaska. Statewide population estimate > 4 million birds; apparently stable. Threats include direct habitat loss associated with traditional timber harvest methods of clear-cutting and even-aged management and indirectly by increased exposure to edge-associated predators and parasites.

DISTRIBUTION AND ABUNDANCE

Range:

Global range:

Breeding: Breeds from Alaska south through western Canada to Pacific Northwest and inland through parts of Idaho, Montana, and Wyoming (Stiles and Skutch 1989). Southern range extends west into the Cascades and interior ranges of Oregon and Washington, excluding the Central Basin (Wright et al. 1998).

Non-breeding: Winters in two distinct geographic areas: southwest British Columbia south along Pacific Coast to northern Baja California; and from southeastern Arizona and southwestern Texas through northwestern Mexico, south to highlands of Central America (Stiles and Skutch 1989, Wright et al. 1998).

State range:

Breeding: Coastal and boreal forested regions of the state including eastern interior, southcentral, and southeastern Alaska. Breeds south and east of Fort Yukon, north and east of Anchorage, the Kenai Peninsula south to Cordova, and along the coast throughout Southeast Alaska (Handel et al. 1998, Wright et al. 1998). Common summer resident along the Tanana River near Fairbanks; uncommon east toward Tok and Northway (Kessel and Springer 1966, Spindler and Kessel 1980, Swanson and Nigro 2003). Has been sighted west of McGrath, and as far north as Wiseman (Handel 1998). Northern limit of breeding range is central and south-central Alaska (Matsuoka 1996), documented as far north as Livengood, 50 miles northwest of Fairbanks (Armstrong 1995, Wright et al. 1998).

Abundance:

Global abundance:

Global population estimate is 12,000,000 birds (Rich et al. 2004). Most abundant on North American Breeding Bird Survey (BBS) routes in Washington [6.03 birds per route (bpr)], British Columbia (7.62 bpr), Idaho (7.41bpr), and Montana (5.41 bpr; Sauer et al. 2005). Less than 2 bpr were detected in Alberta and the Yukon. By physiographic strata,

abundance was highest in the North Pacific Rainforest, the Cascades, and the central Rockies (Sauer et al. 2005).

State abundance:

Statewide population estimate is 4,100,000 birds (about 34% of global population; Rosenberg 2004); although this estimate is suspected inaccurate (ADFG 2005). The relative abundance for Alaska BBS routes combined was 3.01 birds per route (bpr; Sauer et al. 2005). Species was most abundant in southcoastal Alaska where 15.5 bpr were recorded; within the southcoastal region, much higher numbers were reported from routes on the Kenai Peninsula (8.3-49.0 bpr) than elsewhere (Pogson et al. 1997). In southeast Alaska, 6.6 bpr were recorded (range 0.3-14.5 bpr) with highest numbers near Craig, Ketchikan, and Sitka (range 10.0 – 14.5 bpr). Lowest numbers were reported from central Alaska (2.8 bpr; Pogson et al. 1997).

Kissling (2003) measured densities of 0.5 birds/ac (1.2/ha) for singing males in Southeast old-growth forests. Stotts et al. (1999) detected 0.9 individuals per count on 187 point counts on Tongass Research Natural Areas (RNA). Cotter and Andres (2000) reported average density of 16.3 birds/BBS route in southeast Alaska, 22.1 birds/BBS route on the southern coast, and 0.04 birds/BBS route in central Alaska. The highest density of 50 birds per year was recorded on two BBS routes in the Tongass National Forest (Thorne Bay and Chichagof; Cotter and Andres 2000). A survey of major riparian habitats across the Tongass reported higher detection frequencies along coastal rivers (0.44 individuals/count) compared to the large trans-mountain rivers (0.04 individuals/count) connecting coastal areas with interior regions (Johnson 2003).

Trends:

Global trend:

North American Breeding Bird Survey (BBS) data indicate the population is stable to slightly increasing, with an average increase of 0.5% per year from 1966-2004 based on data from 199 survey routes (Sauer et al. 2005).

State trend:

North American Breeding Bird Survey (BBS) data indicate no significant population trend, with an average increase of 0.4% per year from 1980-2004 based on data from 36 survey routes (Sauer et al. 2005). However, the species may not be monitored with sufficient intensity in the BBS to detect a trend in the population (Peterjohn et al. 1995).

EXISTING PROTECTION

Global protection:

Habitat protected in national and state wildlife refuges and parks.

State protection:

Habitat protected in national and state wildlife refuges and parks. Common breeding bird in the Chugach and Tongass National Forests (Cotter 2005).

CHALLENGES

Global challenges:

The largest and most imminent threat is habitat loss on both wintering and breeding grounds (Reed 1991). Considered one of the long-distance migrants most likely to be negatively affected by alteration of tropical forest habitats because of their predominant use of mature coniferous and pine-oak forest habitats in Mexico and Central America (Vidal-Rodriquez 1992, Petit et al. 1995). These preferred montane habitats are undergoing rapid conversion to pasture land, corn and coffee plantations, and residential development (Wright et al. 1998).

Breeding populations may be susceptible to traditional timber-harvesting practices such as clear-cut logging and even-aged management (Wright et al. 1998). These methods typically result in the loss of habitat features that Townsend's are known to select for (Spindler and Kessel 1980, Mannan and Meslow 1984, BPIF 1999). Timber harvest-associated habitat fragmentation increases exposure to edge-related predators and parasites, and could potentially reduce breeding densities (Gates and Gysel 1978, Brittingham and Temple 1983, Andren and Angelstam 1988).

Brood parasitism by Brown-headed Cowbird is an important predator for most open-nesting passerines (Wright et al. 1998). Nest predators in north temperate forests include red squirrel (*Tamiasciurus hudsonicus*), eastern chipmunks (*Tamias striatus*), northern flying squirrel (*Glaucomys sabrinus*), and Blue Jay (*Cyanocitta cristata*) (Reitsma et al. 1990, Holmes et al. 1992).

State challenges:

Breeding populations may be susceptible to traditional timber-harvest practices such as clear-cut logging and even-aged management (Wright et al. 1998). These methods typically result in the loss of habitat features (forest structure, composition, configuration, and connectivity) that Townsend's are commonly associated with (Spindler and Kessel 1980, Mannan and Meslow 1984, BPIF 1999). Many important habitat attributes in mature stands do not develop in harvested stands for more than 100 years (Sallabanks et al. 2001 in ADFG 2005). In addition to direct loss of breeding habitat, timber harvest-associated habitat fragmentation increases exposure to edge-related predators and parasites which could effectively reduce breeding densities (Gates and Gysel 1978, Brittingham and Temple 1983, Andren and Angelstam 1988). Considered a species of conservation priority in Southeast Alaska by Boreal Partners in Flight (BPIF; 1999) because of the high percentage of the continental population breeding in an area susceptible to large-scale logging (Cotter 2005).

Blowfly parasitism and nest predation are also significant threats. There is also some concern regarding the effects of climate change on Alaskan forests (ADFG 2005); breeding densities on the Kenai Peninsula were reduced following fires and outbreaks of spruce beetles (Quinlan 1978, Lance and Howell 2000), both of which are influenced by warming climatic patterns. Black-throated Blue Warblers (*Dendroica caerulescens*) experience low survival during El Niño years and extremely high mortality (90%) during

migration (Sillett et al. 2000), suggesting that changes in local habitats and migratory conditions caused by climatic warming could have large implications for other migratory bird populations as well (Matsuoka pers. comm.).

RESEARCH AND INVENTORY NEEDS

Global research needs:

Determine vulnerability of wintering birds to losses of mature forest in montane regions of Mexico and Central America (Wright et al. 1998). Study sensitivity of species to wintering habitat changes related to site fidelity, territoriality, and age- and sex-based dominance hierarchies (Rappole et al. 1983, Greenberg et al. 1993). Examine how increases in forest edge and reductions in contiguous forests affect this species (Wright et al. 1998). Identify the demographic transitions most important in determining population growth (Hayward and McDonald 1997). Examine the ecological relationship between Townsend's and Hermit Warblers in areas where they hybridize (Wright et al. 1998).

State research needs:

Information needed on long-term effects of timber harvest, fire, insect outbreaks, salvage harvest, climate change, and pre- and post-harvest prescriptions on populations (ADFG 2005). More information needed on specific habitat requirements. Establish linkages between breeding and wintering populations to help guide research and conservation toward key wintering areas for Alaska's breeding Townsend's. Genetic study is needed to determine if Townsend's Warblers breeding in southern southeast Alaska are genetically similar to birds breeding on the Queen Charlotte Islands but different than those breeding elsewhere in the state.

Global inventory needs:

Comparative information on disjunct wintering populations in Oregon, California and Mexico, and Central America needed; such information would help determine status of populations experiencing rapid losses of wintering habitats in tropical regions, in comparison to temperate regions (Wright et al. 1998).

State inventory needs:

Maintain current participation in the roadside BBS; fully implement the Alaska Landbird Monitoring Survey (ALMS) program in Alaska (ADFG 2005). Joint analysis of data from the BBS and a fully implemented ALMS program would greatly improve estimates of population trend and habitat use. ALMS plots have been established on the Tongass National Forest in order to detect a 50% population change in a given species over a 25-year period (Cotter 2005 and sources therein). Effectiveness of the plan is being evaluated. Develop inventories/simulation models to assess the short-term effects of landscape changes on communities in areas undergoing rapid and widespread changes in forest cover. Quantify and monitor the amount and distribution of appropriate forest habitat (ADFG 2005).

CONSERVATION AND MANAGEMENT NEEDS

Global conservation and management needs:

As morphometric study suggests, there are at least two subspecies of Townsend's Warbler (Morrison 1983); a comparative genetic analysis of phylogeography would be useful to define appropriate population units for conservation. Relative to habitat management, techniques to hasten post-harvest growth of trees to old-growth stature should be studied and developed.

State conservation and management needs:

Clear-cutting and even-aged forest management typically result in long-term loss of habitat features that breeding Townsend's Warblers select for (Spindler and Kessel 1980, Mannan and Meslow 1984, Kessler and Kogut 1985, Matsuoka 1996). Forest management that protects important resources such as stands of large diameter trees, riparian corridors, and snags will likely be the most beneficial means to insure warbler population health in the future (Cotter 2005). Techniques to hasten post-harvest growth of trees to old-growth stature should be studied and developed (S. Matsuoka, pers. comm.). Determination of the relationship between Townsend's Warblers breeding in Alaska and birds breeding on the Queen Charlotte Islands could help guide appropriate monitoring, management, and conservation of the species.

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