

# STATUS OF THE HERMIT WARBLER IN WASHINGTON

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The Hermit Warbler (*Dendroica occidentalis*) reaches the northern limit of its breeding range in Washington, where its status has been unclear. The Hermit Warbler frequents treetops where it is difficult to observe, and its song resembles those of the Black-throated Gray Warbler (*D. nigrescens*) and Townsend's Warbler (*D. townsendi*). Other than a few references to a preference for tall conifers (Bowles 1906, Dawson and Bowles 1909, Rathbun 1916), mature coniferous forests (Pough 1957), and moderately dense coniferous forests (Cogswell 1957), little was known of its habitat requirements. The few scattered records of Hermit Warblers in Washington prior to 1970 provided little indication of its status, and most authors classified it as uncommon in coniferous forests of western Washington.

In the 1970s the number of records increased substantially as the number of field observers increased. Consequently, Wahl and Paulson (1977) concluded that the Hermit Warbler's principal range in Washington was the southern Cascade Range and that it was common in that area. However, its status in other parts of the state and its specific habitat requirements were still uncertain. The purpose of this study was to delineate Hermit Warbler habitat requirements and to synthesize existing information on its distribution and abundance in Washington.

## METHODS

Information on distribution and abundance of the Hermit Warbler was derived from the literature, the regional editor's files of *American Birds* (AB files), the Washington Department of Game Data Storage and Retrieval System (WDG), personal interviews with knowledgeable people, and field work conducted as part of this study. During May and June 1979 we searched for Hermit Warblers in several areas of western Washington where its status was unknown, but its presence seemed likely. Appropriate habitats were surveyed by driving roads and frequently stopping to listen for Hermit Warblers; searches were also made along several hiking trails.

Due to the variability and overlap in songs of Townsend's and Hermit warblers, many of the warblers we heard, but did not see, were not identified. Those that we did identify by sound only were separated by their song endings. Hermit Warbler songs often end with two abrupt, low-pitched notes. All of the many warblers in the southern Cascades that we were able to

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visually identify while they sang the low-pitched ending were Hermit Warblers. So, in the southern Cascades we used the low-pitched ending as our sole means of distinguishing them by sound. In areas outside of their principal range in the southern Cascades (see Figure 1), identification by sound alone is questionable and all of our listed records are of birds identified by sight.

An intensive habitat survey was conducted in the southern Cascades of Washington. The object was to find how many different forest types supported territorial Hermit Warblers and to analyze habitat characteristics of representative stands. During June 1979 we drove 30 km of roads in the St. Helens and Randle ranger districts in Skamania, Lewis and Cowlitz counties, in a search for Hermit Warbler habitat. We stopped at arbitrary points along roads in all forest types and listened for singing Hermit Warblers. We collected data on habitat characteristics in each of 13 representative stands where we found two or more singing Hermit Warblers.

Tree species composition in each stand was quantified using the point-centered quarter method (Cottam and Curtis 1956) with points spaced at 5 m intervals along five 50 m transects. Transects generally ran parallel except where terrain prohibited. Cover in the shrub layer was measured along each transect using the line-intercept method (Cottam et al. 1953). Canopy closure was determined by the percentage of points at which the canopy occupied more than 50% of the area directly above each transect point. Elevation, aspect of slope, mean canopy height and stand age were also determined for each stand.

Tree species composition of the stands was analyzed by a two axis ordination (Mueller-Dombois and Ellenburg 1974) calculated from species importance values representing the sum of the relative density, dominance and frequency values of each tree species. This ordination graphically emphasized differences among stands in tree species composition (correlation coefficient = 0.834).

## DISTRIBUTION AND ABUNDANCE

Figure 1 illustrates the known distribution of the Hermit Warbler in Washington. All localities mentioned in the following regional review of its past and present distribution and abundance are represented in Figure 1.

**OLYMPIC PENINSULA.** Very few records exist prior to the 1970s, possibly because of a lack of ornithological investigation in the region. Rathbun (1916) regularly found singing Hermit Warblers during the breeding season in the Lake Crescent area, Clallam County, but considered the species uncommon. Hermit Warblers were found during the breeding season at the Quillayute Prairie, Clallam County, (Jewett et al. 1953), but dates and abundance were not reported. A single bird seen on Hurricane Ridge,

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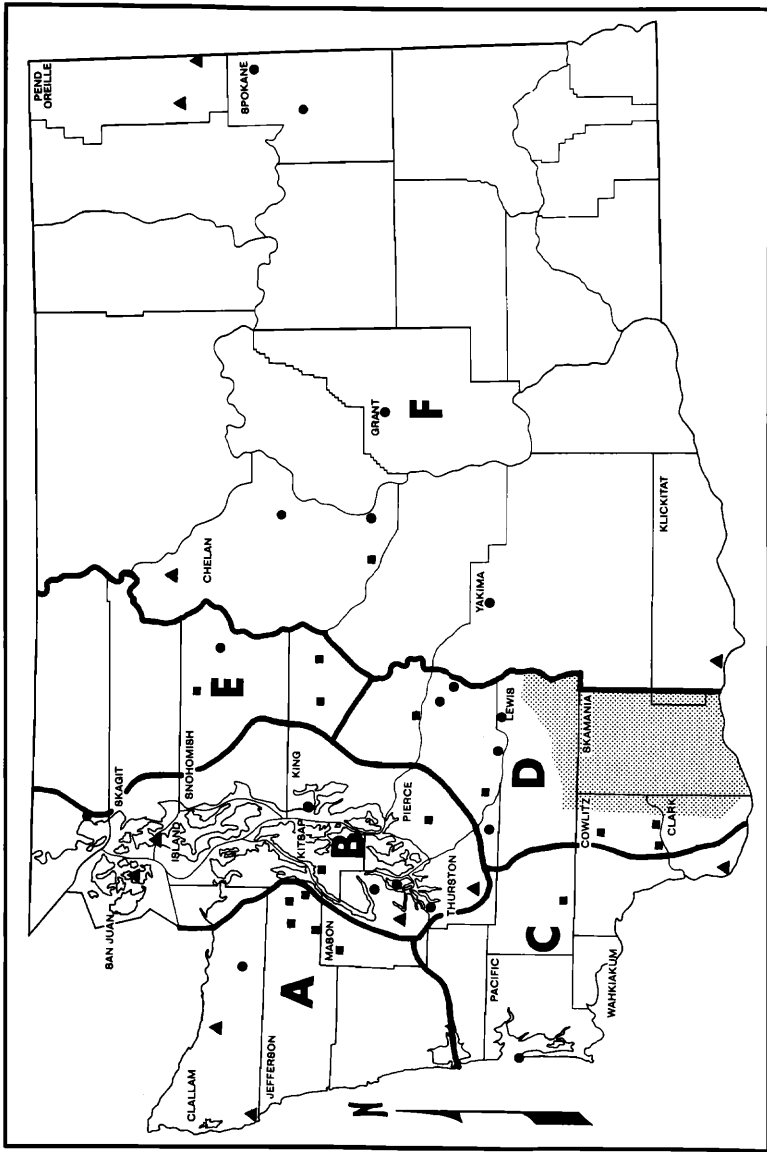


Figure 1. Known distribution of the Hermit Warbler in Washington. Dark lines separate regions: A = Olympic Peninsula; B = Puget Sound Trough; C = Southwest Washington; D = West slope of southern Cascades; E = West slope of northern Cascades; F = Eastern Washington. Shaded area represents principal range where the Hermit Warbler is widespread; ▲ = historical record (before 1960); ■ = recent (after 1960) probable breeding site (male on territory during breeding season, i.e., June-early July); ● = recent record (probably nonbreeding).

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Clallam County, on 13 July 1974 (AB files) fits the pattern of late summer up-mountain movements noted by Cogswell (1957). Three singing males were seen at Staircase on Lake Cushman, Mason County, on 9 June 1977 (AB 31:1182, 1977). Jewett et al. (1953) also indicated that Lake Cushman was a breeding season locality. Two singing males were seen at Lena Lake in the Hamma Hamma River drainage, Jefferson County, on 16 June 1978 (pers. obs.). During this study singing males were seen in the Dosewallips River Valley and near Mt. Jupiter, Jefferson County, on 28 May and 10 June 1979. Based on the recent increase in observers and sightings in the region, the Hermit Warbler appears to be a fairly common breeder on the east slope of the Olympic Mountains and to be less common (probably rare) in other areas of the Olympic Peninsula. Future investigations may reveal a few warblers at other localities on the peninsula.

**PUGET SOUND TROUGH.** The warbler's historical status in Washington was well documented at only one location: the South Tacoma-Spanaway area of Pierce County. According to Bowles (1906, 1929), it was common in the stretches of fir woods in this prairie country from 1899 to 1921. Bowles (1929) noted a steady population decline from 1921 to 1929. Since then, the Hermit Warbler has been less common, but still present until recently. The most recent breeding record from Spanaway was 1966, and the last sighting was on 1 June 1974 (AB files). During May and June 1979, 2 days were spent searching for Hermit Warblers at Spanaway and adjacent Fort Lewis, but none were found. Jewett et al. (1953) listed Tenino, Thurston County, and Shelton, Mason County, as breeding season localities. Both areas exhibit a forest/prairie mosaic similar to that at Spanaway. For some unknown reason the Hermit Warbler has disappeared from the southern Puget Sound prairie country.

Wahl and Paulson (1977) mentioned historical records from Deception Pass, Skagit and Island counties. A bird was seen during migration on Lopez Island, San Juan County, in 1936 (WDG). Single birds were seen during migration in the Seattle area, King County, on three occasions: 12 April 1954 (AFN 8:326, 1954), 16 August 1955 (AFN 10:49, 1956), and 15 May 1975 (D. Paulson, pers. comm.). Hermit Warblers recently seen in the southeast Puget Sound area at Eld Inlet, Thurston County, on 23 August 1978 (AB files) and at Mason Lake, Mason County, on 25 July 1979 (WDG) were possibly migrants from the population that breeds on the eastern Olympic Peninsula. The sighting of two birds on Harstene Island, Mason County, on 12 June 1977 (AB 31:1182, 1977) indicated the possibility of a small breeding population, although the birds were more likely vagrants. A pair resided at Scenic Beach State Park, Kitsap County, from 10 May 1979 through the breeding season (WDG). This location is just across Hood Canal from a breeding population on the Olympic Peninsula, and birds on the Kitsap Peninsula possibly represented an expansion of the Olympic Peninsula

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population. A male at Bellingham, Whatcom County, on 16 May 1981 (J. Duemel pers. comm.), was the northernmost record of which we are aware. Currently, the Hermit Warbler is a rare summer resident and occasional migrant in the Puget Sound Trough.

**SOUTHWEST WASHINGTON.** Townsend (1837) first described the Hermit Warbler from a specimen taken at Vancouver, Clark County, but there were no subsequent records from the area until 5 September 1965, when one was seen during migration at Leadbetter Point, Pacific County (AFN 20:86, 1966). Another was seen 17 June 1975 on the Long Beach Peninsula, Pacific County (AB files), and possibly represented a vagrant. The single singing male seen during this study at Toledo, Lewis County, on 1 June 1979 may have been on its breeding grounds, but was probably a migrant. This inexplicable sighting prompted a search of the Willapa Hills, Pacific and Lewis counties, on 8-9 June 1979, but no Hermit Warblers were found. Hermit Warblers occur in the Coast Range of Oregon (Gabrielson and Jewett 1940, AB files), but apparently are absent or rare in the Willapa Hills, the range that links the Coast Range and the Olympics.

**WEST SLOPE OF SOUTHERN CASCADES.** From Randle and Packwood, Lewis County, south to the Columbia River, the Hermit Warbler is a common breeding bird (D. Fix pers. comm., B. Harrington-Tweit pers. comm., pers. obs.). As Wahl and Paulson (1977) noted, this is the warbler's principal range in Washington (Figure 1). In June 1979 we heard several singing birds at three localities in the foothills of Cowlitz County; the Hermit Warbler may be a widespread breeder in the foothills west of its principal range.

North of Randle and Packwood the Hermit Warbler is uncommon, and we discovered no records previous to 1970. At the Bald Hills, Thurston County, a single bird was seen on 9 May 1970 (WDG), and two singing males were seen on 6 June 1981 (pers. obs.). Two sightings of individual birds were made during late summer 1976 in Mt. Rainier National Park, Pierce County (WDG): near Crystal Lake on 25 July and at Longmire on 14 August. Another was seen along the West Fork White River, Pierce County, on 14 May 1977 (pers. obs.). The male seen 19 July 1978 at Reflection Lakes, Lewis County, in Mt. Rainier National Park (pers. obs.) was probably a post-breeding season up-mountain wanderer. Recent investigations in the Pack Forest near LaGrande, Pierce County (B. Harrington-Tweit pers. comm., WDG), and Federation Forest State Park, King County (Wahl and Paulson 1977, B. Harrington-Tweit pers. comm.), have shown the Hermit Warbler to be a fairly common and regular breeder at both localities. Possibly it is more widespread as a breeder in the Cascades of northern Lewis County, Pierce County and southern King County than these two known breeding sites indicate.

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**WEST SLOPE OF NORTHERN CASCADES.** During summer 1979, a number of Hermit Warblers were seen in the northern Cascade region, where none had previously been recorded. Two territorial males were seen during the latter half of June 1979 south of Darrington, Snohomish County (pers. obs.). Two males were also seen along the North Fork Snoqualmie River, King County, on 28 June 1979 (AB 33:892, 1979). "Numbers" were found at Otter Lake near Skykomish, King County, on 9 July 1979 (AB 33:892, 1979). One was seen west of Glacier Peak, Snohomish County, on 16 August 1979 (pers. obs.). The preponderance of sightings during 1979 was not due to a previous lack of observers, as the area has received considerable exploration, but could be attributed to an expansion of birds out of their principal breeding grounds further south.

**EASTERN WASHINGTON.** Most of the possible Hermit Warbler breeding records east of the Cascade Crest came from around the turn of the century. Stehekin, Chelan County, and the Calispell Range and Newport, Pend Oreille County, were listed as breeding areas by Dawson and Bowles (1909), and Dawson (1897) collected a specimen near Stehekin. Jewett et al. (1953) also reported sightings at Stehekin in 1900 and at Calispell Lake in 1906. A bird was seen during migration at Lyle, Klickitat County, on 19 August 1918 (Jewett et al. 1953). LaFave (1955) saw six on Mt. Spokane, Spokane County, on 30 August 1954. Single birds were seen near Spokane, Spokane County, on 26 May 1964 (AB files); at Wenas Park, Yakima County, on 29 May 1971 (AB 25:774, 1971); on Swakane Wildlife Recreation Area, Chelan County, on 18 May 1972 (WDG); at Wenatchee, Chelan County, on 12 September 1972 (WDG); and at Ephrata, Grant County, on 14-15 May 1977 (AB 31:1027, 1977). These recent records of migrants suggest the possibility that a few still breed in the mountains of northeastern Washington. The only recent possible breeding record was of a pair seen at Swauk Pass in the Wenatchee Mountains, Chelan County, on 15 June 1978 (WDG).

The Hermit Warbler was apparently more abundant in the Pacific Northwest during 1979 than in recent years. This conclusion was evidenced by (1) the comments from many observers in Oregon on the species' unusually large numbers there (AB 33:892, 1979); (2) a noticeable expansion of birds into the northern Cascades of Washington; and (3) a few sightings in other areas of Washington where Hermit Warblers were not found before. Future field work will show whether this "good year" represents a single-season peak in abundance or the beginnings of a non-cyclic population increase and range expansion.

## HABITAT REQUIREMENTS

During the 1979 breeding season Hermit Warblers occurred in two major forest zones: the *Tsuga heterophylla* (Western Hemlock) zone and the *Abies amabilis* (Pacific Silver Fir) zone. The Hermit Warbler apparently did not breed regularly in the only other forest zone on the study area, the *Tsuga mertensiana* (Mountain Hemlock) zone, as we were unable to find any in this zone and we failed to locate any breeding season reports from this zone in Washington.

The *T. heterophylla* zone typically occurs in moist areas from sea level to 900 m in southern Washington (Franklin and Dyrness 1973). Major tree species in this zone are Douglas-fir (*Pseudotsuga menziesii*), Western Hemlock and Western Redcedar (*Thuja plicata*) (Franklin and Dyrness 1973). The *A. amabilis* zone lies between the temperate mesophytic *T. heterophylla* zone and the subalpine *T. mertensiana* zone, generally at elevations of 900-1300 m in southern Washington (Franklin and Dyrness 1973). It is wetter and cooler than the *T. heterophylla* zone and warmer with less snow pack than the higher *T. mertensiana* zone. Major tree species are Pacific Silver Fir, Western Hemlock, Noble Fir (*Abies procera*), Grand Fir, Douglas-fir, Western Redcedar, Lodgepole Pine (*Pinus contorta*) and Western White Pine (*Pinus monticola*) (Franklin and Dyrness 1973).

The ordination of Hermit Warbler habitats (Figure 2) illustrated the relative similarities and differences in tree species composition among the stands we analyzed. The ordination clearly segregated stands of the *T. heterophylla* and *A. amabilis* zones (Figure 2). At low elevations we found an association of Western Hemlock and Douglas-fir that corresponded to the *T. heterophylla* zone. Stands 10, 11 and 13 (Figure 2) were characteristic young seral communities dominated by Douglas-fir; stands 10 and 11 were 50-60 years old; and stand 13 was about 25 years old. Stands 2 and 12 were dominated by Western Hemlock and Douglas-fir, with hemlock the primary reproducing species under a canopy of mature (100-200 years) and old-growth (200+ years) Douglas-fir. Stand 7 was an old-growth community dominated by Western Hemlock. Stand 9 was an old-growth riparian community dominated by Western Redcedar and Grand Fir. Western Hemlock was the major reproducing species under the canopy of all stands within the *T. heterophylla* zone.

The second major group of stands on the ordination corresponded to the *A. amabilis* zone (Figure 2). Stand 4 was a young community (35 years) dominated by Western Hemlock, Western Redcedar and Pacific Silver Fir, and was located in an area of transition between the *T. heterophylla* and *A. amabilis* zones. Stands 1 and 3 were dominated by old-growth Pacific Silver Fir and Western Hemlock. Stand 6 was a unique association of Pacific Silver Fir and Lodgepole Pine that resulted from the dry, infertile soils developed from prior volcanic activity of Mt. St. Helens (Franklin 1966). Stand 8 was dominated by old-growth Grand Fir and a younger component of Pacific

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Silver Fir. Stand 5 was an old-growth community dominated by Noble Fir and Pacific Silver Fir typical of cooler sites near the upper elevational limits of the *A. amabilis* zone. Pacific Silver Fir was dominant or codominant and was the major reproducing species in all stands within the *A. amabilis* zone.

The ordination of 13 representative stands (Figure 2) indicated that Hermit Warblers were not specific in their habitat requirements, using a variety of coniferous forest associations within the *T. heterophylla* and *A. amabilis* zones. Forests used were dense (mean canopy closure 70%), except for the Lodgepole Pine community (Stand 6, canopy closure 6.5%). Mean canopy height ranged from 13.6 m to 42.6 m. Deciduous trees were frequently codominant in the understory or a minor component of the canopy, especially in young stands. Cover in the shrub layer ranged from 3% to 48% (mean 16%), and shrub species conformed to expected associations with canopy species. The shrub layer appeared to be an incidental factor in habitat requirements as Hermit Warblers foraged and sang mainly in the canopy or

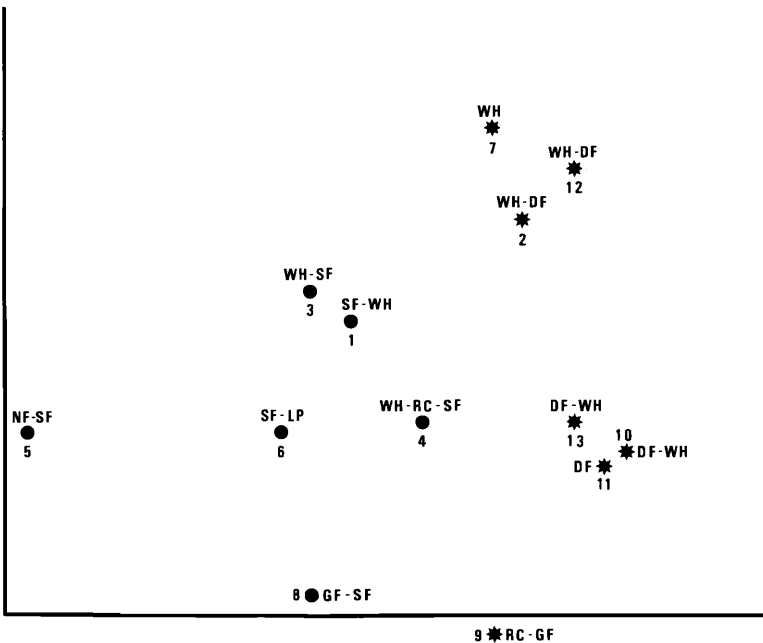


Figure 2. Community ordination of forest stands representing Hermit Warbler habitat in the southern Cascades of Washington. Numbers correspond to those used in the text. Forest zones: ★ = *Tsuga heterophylla* zone; ● = *Abies amabilis* zone. Tree species: WH = Western Hemlock; SF = Pacific Silver Fir; GF = Grand Fir; NF = Noble Fir; DF = Douglas-fir; RC = Western Redcedar; LP = Lodgepole Pine.



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just below it. Aspect of slope also appeared to be an incidental factor in Hermit Warbler habitat requirements. Stand age ranged from second-growth as young as 25 years to old-growth (200 + years). Hermit Warblers appeared to be as numerous in young stands as in mature and old-growth stands, but this abundance in young stands may have been related to the apparent population increase of 1979. A study comparing population densities in various forest types (especially second-growth vs. old-growth) would be an appropriate follow-up to our study and would better define any management needs.

The habitat requirements delineated for Hermit Warblers in the southern Cascades appeared to be a fairly accurate representation of the Hermit Warbler's habitat use in other regions of Washington. West of the Cascade crest the Hermit Warbler breeds in various coniferous associations of the *T. heterophylla* and *A. amabilis* zones. The Hermit Warbler apparently does not breed in the coastal *Picea sitchensis* (Sitka Spruce) zone nor the subalpine *T. mertensiana* zone. However, there are two recent records (probably migrants) and one historical breeding season record from the coast (Figure 1), and there are several late summer records from the subalpine zone that fit the pattern of up-mountain movement after the breeding season noted by Cogswell (1957). The only recent possible breeding site east of the Cascade crest was an old-growth stand of Grand Fir and Douglas-fir in the Wenatchee Mountains (Figure 1).

The Townsend's Warbler is a very close relative of the Hermit Warbler. They have similar songs and habitat requirements, and their ranges overlap in the Cascade and Olympic mountains of Washington. Very little is currently known of the interactions between these two species that were frequently found breeding in close proximity to one another (B. Harrington-Tweit pers. comm., pers. obs.) and that have hybridized at least occasionally (Jewett 1944). Recently, hybrids have been found in Washington at the Pack Forest near LaGrande, Pierce County (B. Harrington-Tweit pers. comm.), and in Federation Forest State Park, King County (Wahl and Paulson 1977).

The most distinct difference that we observed in the habitat preferences of the two species was that the Hermit Warbler occurred only in the low to middle elevation forests of the *T. heterophylla* and *A. amabilis* zones, whereas the Townsend's Warbler also occurred in the higher elevation subalpine forests of the *T. mertensiana* zone. There is no apparent habitat or niche separation between the Hermit and Townsend's warblers in areas where they both occur (B. Harrington-Tweit pers. comm., pers. obs.). This interspecific relationship raises many questions, some of which will hopefully be answered by future research.

## SUMMARY

The Hermit Warbler is uncommon to rare over most of Washington State and its status has been unclear. The principal range of the Hermit Warbler in Washington is the west slopes of the southern Cascades where it is a com-

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mon summer resident and breeder. The Hermit Warbler breeds uncommonly further north on the west slopes of the Cascades in Pierce and southern King counties. Prior to 1979, the Hermit Warbler had not been recorded on the west slopes of the northern Cascades. During the summer of 1979 several sightings were made in the northern Cascades, indicating an expansion out of the usual breeding grounds further south. The Hermit Warbler has declined in numbers in the Puget Sound region since the early 1900s. It was formerly of regular occurrence in the forest/prairie mosaic of the southern Puget Sound region, but it is now rarely seen in that area. The Hermit Warbler is now a rare summer resident and occasional migrant in the Puget Sound region. Recently, it was discovered that the eastern slopes of the Olympic Mountains harbor a sizable population of Hermit Warblers; the species is a fairly common summer resident and probable breeder in the area. Hermit Warblers are rare east of the Cascade crest where there have been several recent records during migration and only one recent breeding season sighting. Available evidence indicated that Hermit Warblers were more abundant than usual in Oregon and Washington during 1979.

Hermit Warblers in the southern Cascades of Washington used a variety of coniferous forest associations within the *Tsuga heterophylla* and *Abies amabilis* zones. None were found during the breeding season in the subalpine *Tsuga mertensiana* zone. Most forests used were moderately dense. Hermit Warblers occurred in second-growth forests (as young as 25 years) as well as in mature and old-growth forests. The closely related Townsend's Warbler occasionally hybridizes with the Hermit Warbler and the two species often breed in close proximity to one another. The Townsend's and Hermit warblers exhibited no observable habitat segregation.

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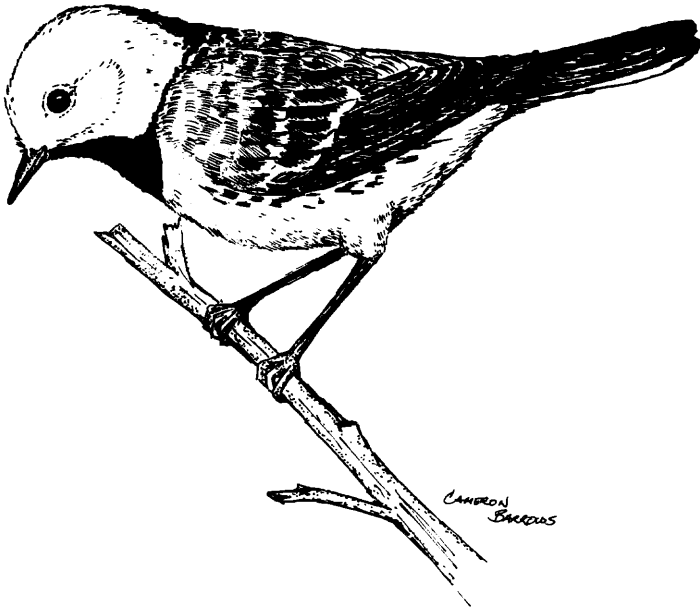
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*Sketch by Cameron Barrows*