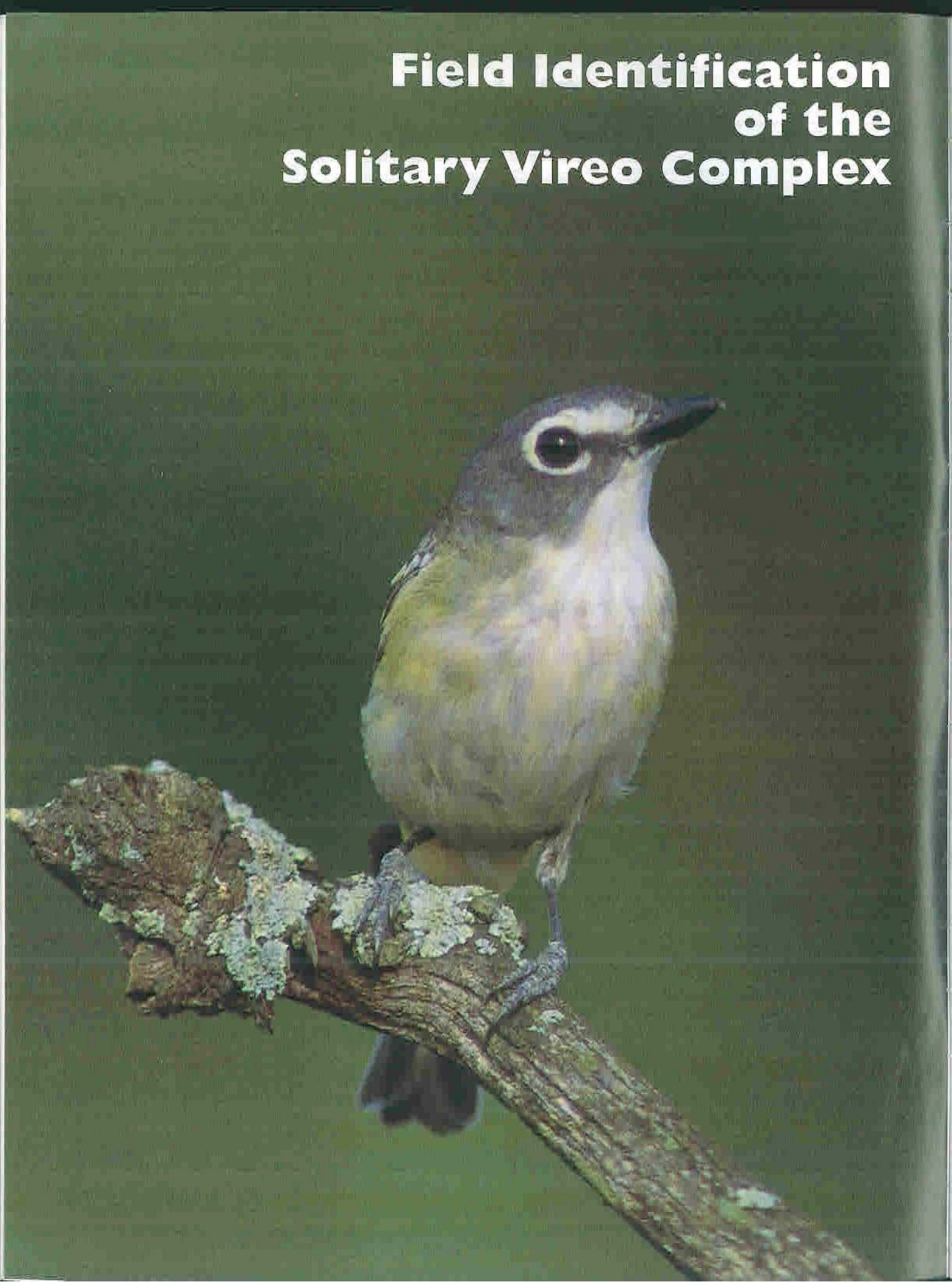
Field Identification of the Solitary Vireo Complex



In Brief

Some taxonomists are urging a split of the Solitary Vireo into two or three distinct species. Most individuals of this complex are identifiable to subspecies in the field if seen well. Characters to concentrate on include the exact color of the head, upperparts, flight-feather edges, and sides and flanks. Identification can be complicated by overlap in many features. In addition, many definitive characters can be subtle and require that the observer has comparative experience with the subspecies and exercises caution.

MATT T. HEINDEL*

THE SOLITARY VIREO (*Vireo solitarius*) is a fairly common passerine present throughout much of the U.S. and Canada. This paper focuses on the three main subspecies groups found in the ABA Area. Most individuals are identifiable in the field, and recent guides (e.g., Farrand 1983, NGS 1987) have given a basic, if not oversimplified, understanding of this group. Other works (e.g., Dunn 1976 and Zimmer 1985) have treated the topic in greater detail. Nevertheless, a more thorough analysis is needed.

This article deals primarily with identification, although it also discusses Solitary Vireo taxonomy and distribution. I concentrate on the races occurring north of Mexico, but I also mention races from Baja California and points south where appropriate. The taxonomy south of the border is complex, however, and, while these races are critical to understanding how many species are involved, a complete treatment is beyond the scope of this paper.

Taxonomy

First described as *Muscicapa solitaria* by Wilson (1810), the Solitary Vireo has been the subject of much taxonomic debate. The complex has been divided into three groups, representing four subspecies. In 1957, the AOU recognized three groups as follows:

- "Blue-headed": the northern and eastern race, *V.s. solitarius,* and *V.s. alticola* of the Appalachians,
- "Cassin's": the Pacific race, *V.s. cassinii,*
- "Plumbeous": the gray Rocky Mountain and Great Basin race, *V.s. plumbeus.*

The 1983 *A.O.U. Checklist* did not include subspecies. It did suggest, however, that more than one species may be involved, but any official changes in taxonomy would have to await publication of the relevant data. Barlow et al. (1989) suggested that *V.s. solitarius* and *V.s. cassinii* overlap in Alberta, yet they behave as separate species. Sibley and Monroe (1990) split this complex into three species, as outlined above. More recently, Johnson (1995) has recommended specific status for *plumbeus*.

It is important to note that—from a taxonomic perspective—the degree to which birds may look like one another in the field may have little to do with whether or not they are separate species. From a field identification perspective, however, my enthusiasm for splitting these birds has diminished, due to both the variation within the groups and the need for treatment of the entire Solitary Vireo complex, including those races breeding south of the U.S.–Mexico border.

Distribution

"Blue-headed" Vireo. This group, comprising *V.s. solitarius* (Figures 1 and 2) and *V.s. alticola* (Figure 3), nests in a variety of deciduous and coniferous/deciduous woodlands. The breeding range of *V.s. solitarius* extends from northeastern British Columbia, southwestern MacKenzie, and north-central Alberta east to Nova Scotia, and south to northern Minnesota through the Great Lakes region to New England, New York, Pennsylvania, and northern New Jersey (AOU 1957, Godfrey 1986). *V.s. alticola* breeds in the Appalachians from northeastern West Virginia, western Maryland, and western Virginia south to northern Georgia. Over the last decade, "Blue-headed" Vireos (subspecies

*4891 Royce Road, Irvine, California 92715

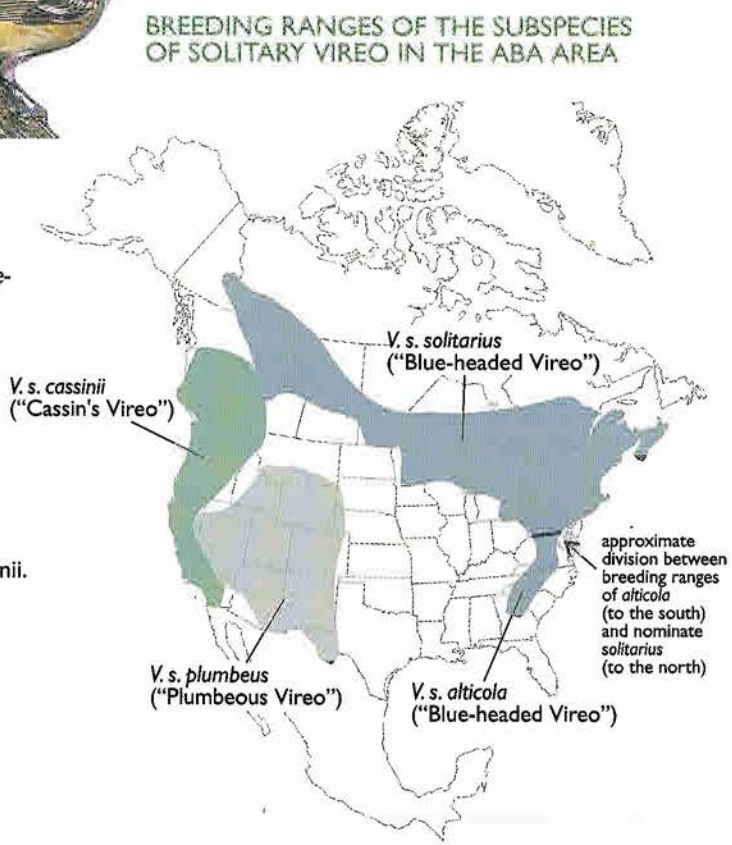
Figure 1. The photograph at left shows the bold contrast typical of Blue-headed Vireo (V.s. solitarius). The entire head is dark blue-gray, whereas the throat (and much of the underparts) is bright white. Note how the gray extends through the auriculars, where it contrasts with the green in the "shoulder" area. The yellow visible at the sides of the breast and in the vent is intense, rarely matched by cassinii. *Photographed by Craig Mokma in Michigan in May 1992.*

uncertain, but probably *alticola)* have been increasingly documented breeding at lower elevations adjacent to the Appalachians and even on the coastal plain. Representative reports exist from northeastern Ohio (Peterjohn 1988), southern Indiana (Brock 1994), western Kentucky (Peterjohn 1990), Alabama (Imhof 1989), and the coastal plain of Virginia (Armistead 1989) and South Carolina (LeGrand 1990). Whether this phenomenon represents a true range expansion or is merely the result of improved observer coverage is uncertain.

The Blue-headed Vireo winters in the Gulf states, through eastern and southern Mexico to Central America, and rarely in Cuba. In the Gulf states, it is normally restricted to areas near the coast where temperatures are relatively mild. Although not normally numerous at this season, 191 were recorded on the Freeport, Texas, Christmas Bird Count in 1991 (*American Birds* 46: 880). Small numbers also winter along the Atlantic Coast north to Virginia. The species is very rare on Christmas Bird Counts north to Massachusetts, with most records probably pertaining to lingering fall migrants. In Mexico, this subspecies group is generally restricted to the Caribbean slope and coastal plain, the adjacent highlands, and the highlands south of Mexico City. It is rare in winter on the Yucatan Peninsula, and rare north of Guerrero and the Central Plateau (S.N.G. Howell, pers. comm.). Contra Sibley and Monroe (1990), this subspecies does not winter regularly in southern California, where it is at best very rare at any season.

CRAIG MOKMA

Figure 2 (above). A typical V.s. solitarius *is characterized by the wholly blue-gray head, which contrasts boldly with a white throat and a green back. The extent of lemon yellow on the flanks of this individual is only rarely matched by* cassinii. *Same individual as in Figure 1.*



B. HENRY/VIREO

Figure 3. This bird is almost certainly V.s. alticola, *the Appalachian race of Blue-headed Vireo, based on the slaty tone to the upperparts, with very little greenish to the back. The underparts are almost white, with the yellow restricted to the vent and lower flanks.*

The migration range of Blue-headed is decidedly more difficult to determine. Certainly, most of the passage takes place through the eastern U.S. and Canada. Just how far west this vireo regularly migrates is uncertain. In Colorado, for example, there is one "definite" record of *solitarius* (through 1991) and others assumedly of this race, but a total of 78 records of non-*plumbeus* Solitary Vireo were thought to pertain mostly to *cassinii* (Andrews and Righter 1992). *V.s. solitarius* is at best very uncommon at this longitude. There are a few records for western Texas (Oberholser 1974). In California, it is a very rare fall vagrant and casual winter visitor. Given that nearly all reports involve sight records, it is probably best to assume some margin of error.

The movements of *V.s. alticola* are poorly understood. This subspecies is found along the Gulf Coast in winter, but to what extent and in what numbers relative to *solitarius* is uncertain. I have been unable to locate any vagrant *alticola* in various museum collections or in the literature. Further, its range (or even its presence) in Mexico is unclear. AOU (1957) implies that its range does not extend south of the U.S. The westernmost record appears to be a winter specimen from Silsbee in east Texas (Oberholser 1974). No doubt much of this mystery is due to its similarity to *V.s. solitarius*. Clearly, more work is needed to better understand the movements and winter range of *V.s. alticola*.

"Cassin's" Vireo. The western counterpart of the Blue-headed Vireo (Figure 4) breeds from southern British Columbia, western Alberta, northern and western Idaho, northwestern Montana, Washington, and Oregon south through the mountains of California to northern Baja California. The preferred habitat is oak, oak/coniferous, and mixed riparian woodlands. Most of this population winters in Mexico, primarily on the Pacific slope and in the interior, south to Oaxaca (Howell and Webb 1995). The resident population in southern Baja California *(V.s. lucasanus)* is usually assigned to this group (Phillips 1991, Howell and Webb 1995).

LARRY SANSONE

Figure 4. This Cassin's Vireo (V.s. cassinii) is a rather typical individual with a dull greenish cast throughout most of the upperparts and, in particular, a dull head. Blue-headed Vireos show more contrast between the head and back. Note the greenish edges to the flight feathers and the pale green color along the sides. Photographed in eastern Riverside County, California, late April 1989.

Nowhere in the U.S. is this bird numerous in winter. It is rare but regular in very small numbers in coastal southern California and very rare in the Lower Colorado River Valley. Although some authors suggest that *cassinii* is more likely to occur than *plumbeus* in winter (e.g., Monson and Phillips 1981), based on personal experience and a review of recent reports in *American Birds/Audubon Field Notes,* I tend to think that *plumbeus* is more likely in the southwestern U.S., except for the coastal slope of southern California; there the two subspecies are found in roughly equal numbers. Rosenberg (1991) discussed the 31 records of wintering Solitary Vireos along the Lower Colorado River from 1975 to 1987: 13 were attributed to *plumbeus,* 8 to *cassinii,* and 10 were not identified to race.

The migration range of *cassinii* is not completely understood. It has been found as far northwest as southeastern Alaska (Phillips 1991). Most migration takes place west of the Rockies. The status of this subspecies farther east is un-

certain. Andrews and Righter (1991) considered it a casual fall migrant on the eastern plains of Colorado. Although *V.s. cassinii* is found with some regularity in western Texas, primarily in late fall and winter, this race has not been documented outside of the Trans-Pecos region (Lasley and Sexton 1989). There is, however, a specimen from Louisiana taken in Cameron Parish on 20 September 1987 (LSUMZ 135161; Remsen et al. 1996). There are also specimens from New York and New Jersey from October and December, respectively (Phillips 1991). Another bird was photographed at Halibut Point, Massachusetts, on 16 November 1991 (T. Leukering, pers. comm.), and a bird was mistnetted and photographed at Tadoussac, Québec, 6 September 1995 (Aubry and Bannon 1996). A sight record from Cap-Tourmente, Québec, "closely observed 22 May 1989, judged by its uniform greenish head to be possibly *cassinii*" (Gosselin 1989), and a sight record from Chicago 3–5 May 1994 (Brock 1994) are intriguing. Much still needs to be learned about the patterns of vagrancy in *cassinii*.

"Plumbeous" Vireo. This subspecies (Figure 5) breeds in pinyon/juniper, Ponderosa Pine, aspen, cottonwood, and oak woodland habitats—typically in drier climates than does *cassinii*. It ranges from the mountains of southern Idaho, Wyoming, southern Montana, and southwestern South Dakota, south through Nevada, east-central California, and southeastern Arizona, eastward to west Texas (AOU 1957). It has overlapped with *cassinii* in the San Gabriel Mountains of southern California, although it has not been numerous in this area in recent years (K.L. Garrett, pers. comm.).

Most Plumbeous Vireos winter in Mexico, but the exact distribution is complicated by local resident populations of other named subspecies and more limited coverage. Plumbeous Vireos winter on the Pacific slope from Sinaloa to Oaxaca, and in some of the adjacent highland areas. Birds of this race found on the Central Plateau are thought to be migrants rather than wintering birds. They are very rare in Baja California, although this status may be, in part, a function of the limited coverage, since they are more numerous (but still rare) in San Diego, immediately to the north. South of the Isthmus of Tehuantepec are some resident populations of Solitary Vireo that are usually placed with this group but that seem to be somewhat intermediate between *plumbeus* and *cassinii* (S.N.G. Howell, pers. comm.).

Most Plumbeous Vireos migrate through the mountain corridor from southeastern Arizona to west Texas and through the central part of Mexico. Farther east, there are few records. A specimen from southwestern Louisiana was taken on 16 September 1984 (LSUMZ 118774; Remsen et al. 1996). There are also sight reports from Nova Scotia on 28 September 1991 at Indian Harbor and 9 October 1994 at Seal Island (B. Maybank, pers. comm.), at Marblehead Neck, Massachusetts, on 29 September 1961 (Veit and Petersen 1993), at Cape May, New Jersey, 8 October 1983 (Sibley 1993), and from southern Florida 3–17 January 1990 (Ogden 1990). Phillips (1991) states that a specimen from New York attributed to this race is suspected of being an axanthic *solitarius,* meaning that it appeared all gray because it lacked yellow pigment. I have not examined this specimen, and, unfortunately, Phillips offers no explanation supporting his conclusion. If a Blue-headed Vireo lacked all yellow and green pigments, I suspect that the back would be pale and the underparts would be white. By comparison, Plumbeous would look darker above and have some dark gray or olive at the sides of the breast. Even so, an axanthic condition could pose a real problem when trying to identify *plumbeus* in the East. In fact, Phillips suggests that any extralimital sighting is risky because it may pertain to a variant of the *solitarius* group.

To the northwest of the subspecies' normal range, there are only two records from Oregon: one in the Catlow Valley on 25 May 1991 (Gilligan 1991) and one at Fields, Harney County, 22+ May 1994 (Tweit and Summers 1994). In southern California, away from breeding locations, *plumbeus* is uncommon in fall, rare in winter, and extremely rare in spring. Many reports of spring *plumbeus* away from their regular range lack documentation and may involve dull, worn *cassinii*. Any extralimital record should be accompanied by the necessary documentation. A more definitive distribution pattern may emerge over time.

GREG R. HOMEL

Figure 5. The entirely gray and white plumage of Plumbeous Vireo (V.s. plumbeus) makes identification usually straightforward. Note in particular the white edges to the secondaries. The dull gray at sides of the breast is typical. Sometimes there is olive mixed with the gray, but, as in this case, the lower flanks are white, lacking any green or yellow typical of Blue-headed and Cassin's. This bird also looks slightly longer (wings and tail) than Blue-headed and Cassin's, and it has a slightly larger bill. Photographed in Madera Canyon, Arizona.

Migration

Some general comments on the timing of Solitary Vireo migration can be made, but the interested reader will need to consult regional guides for more detail. One generalization is the relatively late movement in fall of the Blue-headed Vireo. Because numerous individuals winter in the United States, records of late-fall departures and early-spring arrivals may be difficult to distinguish from wintering birds in many areas.

In spring, Blue-headeds start moving by mid-March and are generally not expected along the Gulf Coast after April (Remsen et al. 1996). Cassin's also start moving in March, but they are still moving through southerly latitudes (e.g., southern California) during mid-May. Plumbeous Vireos may average later in spring, with a peak from late April to mid-May, possibly because their breeding areas are less hospitable until later in spring then are Cassin's. All races have completed the bulk of their migration before the end of May.

In fall, the migration of both Cassin's and Plumbeous Vireos peaks in September (early October in the southwestern portion of the U.S.). In contrast, Blue-headed Vireos are just starting their migration in early September. They are most numerous at northerly locales (e.g., Pt. Pelee, Ontario) from late September through mid-October. They are generally not expected along the Gulf Coast before late October (Remsen et al. 1996).

Molt

Solitary Vireos molt on the breeding grounds. Adults undergo a complete prebasic molt between July and August. Juveniles have a partial molt between July and September. This first prebasic molt involves all secondary coverts and tertials, but no primaries, primary coverts, outer secondaries, or rectrices. Most of these vireos have a partial pre-alternate molt (before spring migration) that usually involves some (but not all) outer greater coverts and tertials. Aging these birds in the field is generally not possible, although any bird seen between September and March with contrastingly fresh tertials is in its first year. The primary coverts are brown in young birds versus dusky in adults.

Identification

The Solitary Vireo complex does not usually pose major identification problems with other vireos. Arguably, a major source of confusion occurs between *V.s. plumbeus* and Gray Vireo *(V. vicinior)* (see page 469). Although some confusion can also exist between *V.s. cassinii* and Hutton's Vireo

(*V. huttoni*), this problem is adequately treated in most field guides. It must be emphasized, however, that there is wide variation in plumage within the complex. Out-of-range birds should be identified with caution. I have held specimens for which racial identification was uncertain. Some birds will simply not be identifiable to subspecies in the field.

Blue-headed Vireo. This is certainly the most colorful group in the complex. Although it is generally unwise to age and sex these birds (and most references imply or state that there are no differences), there is a decrease in brightness and contrast from adult males to immature females, especially with regard to head color. Even so, it is extremely difficult to distinguish adult females from immature males in the field.

The Blue-headed Vireo has a dark gray head that contrasts sharply with the back and the throat (Figures 1 and 2). The gray usually covers all of the crown, the face, and the auriculars, giving the bird a dark gray cheek. In some birds (adult males, in particular) the head is a blue-gray color, hence the group name. In others, primarily at the immature female end of the spectrum, some greenish can be seen on the cheek and crown, but there is still contrast between these areas and the back. The upperparts are usually bright olive-green from the back to the rump. The wings have two bold wingbars that are sometimes whitish, more often greenish to lemon yellow. Yellow edgings are often visible on the secondaries (forming a panel) and tertials.

V.s. alticola—at least birds in extreme plumage—may be distinguishable in the field (Figure 3). Some individuals, primarily adult males, can be slaty above, with very little green on the back, leaving no contrast from crown to back. This color is much darker than the gray of Plumbeous Vireo. Such birds will also differ from Plumbeous by having some bright yellow along the flanks and sides and greenish edges to the flight feathers. Most *alticola* show some green on the back, and many match the pattern of *solitarius* exactly. Some birds of both races also have a substantial amount of white in the tail (Figure 6). Most of this color is on the outer web and distal part of the inner web of the outer rectrices, so it is most easily seen from below on a perched bird. Usually three feathers on each side have some or substantial white. The remainder of the rectrices are dark, enhancing the contrast.

The underparts seem "cleaner" in these two races than in other subspecies, particularly in fall (J.V. Remsen, Jr., pers. comm.). The throat is snow-white, and on some birds (adult males?) this color extends through the center of the breast to the belly (Figure 1). Most birds have bright lemon yellow on the sides of the breast

Subspecific Identification: A Word of Caution

In their paper on the identification of White-crowned Sparrow subspecies, Dunn and Garrett (1995) wrote an excellent summary on the problems associated with the field identification of subspecies. These caveats ought to be kept in mind by all field observers. There is a danger that occurs when we believe that we know more than we really do. Even at the species level, I am often concerned about the ease and finality with which many birdwatchers use when identifying birds. (Plumage variation *within* a species is an under-appreciated problem.) It is as if once an article on difficult-to-identify birds is written (on *Empidonax*, for example), some people insist on identifying every individual that they see. This problem is amplified when dealing with birds at the *sub*specific level. But there are reasons to study birds at the racial level as long as the appropriate caveats are understood. There is a lot to learn regarding breeding and non-breeding ranges, migration, and vagrancy. The key is knowing one's own limits. Identifying subspecies in the field is not straightforward. In fact, museum people will advise against this practice in most cases without a specimen. Some subspecific groups of birds do lend themselves to correct field identification, but even then, observers should use some sort of qualifier, such as *"showing the characters of . . ."*

Some birds defy identification, even in the hand.

and flanks, extending through the vent. On some individuals, this yellow is mixed with green. On others (primarily male *alticola*) there is minimal color below: the yellow, although still fairly bright, may be restricted to the flanks (Figure 3).

Cassin's Vireo. This subspecies is duller and paler than its eastern counterpart (Figure 4). Like *V.s. solitarius,* adult male *cassinii* are at the bright end of the spectrum, and immature females are at the dull extreme (Figure 7). Again, most birds cannot be safely aged or sexed in the field. However, adult males have a predominantly gray head, whereas that of immature females usually is entirely green. The gray is a paler shade than in *solitarius,* and it lacks blue tones. Although the crown can be all gray, the rear of the crown and the auriculars are usually green. The upperparts are usually green from the nape through the uppertail coverts, with the latter appearing brightest. There is less contrast between the head and the back than in Blue-headed.

The wings have two whitish wingbars that are only rarely tinged with yellow. Some individuals show a pale yellow secondary panel, and most birds show yellow or dull green edges to the tertials. The rectrices are often edged with dull green, occasionally with white. Even though the tail pattern is similar to that of Blue-headed, the white pattern on the outer rectrices is more muted because it is not as extensive and the remainder of the tail is paler; thus the contrast is reduced.

The throat is whitish, but in good light it does not appear

Figure 6. The dark gray head, including the auriculars, contrasting with the green back and the white throat (barely visible) are excellent marks for this V.s. solitarius. *Note the bold white edges to the tail feathers, which, combined with the dark centers, gives more contrast than in* cassinii. *This individual was caught and banded on Southeast Farallon Island, California—where it is a very rare vagrant—on 6 October 1993.*

PETER PYLE

MATT HEINDEL

Figure 7. Birds such as this worn V.s. cassinii *are often reported as* plumbeus *in the California desert in spring because they look gray and white. Close inspection, reveals some greenish along the sides and a slight amount of green on the back (often not visible under field conditions). This individual also shows greenish edges to the secondaries, whereas those of* plumbeus *would be white. Butterbredt Spring, California, late May 1995.*

LARRY SANSONE

Figure 8. This dull-plumaged V.s. plumbeus *was photographed prior to the bird's prebasic molt, in July 1989 at Glass Mountain, Mono County, California. The wingbars are almost worn away, and the primaries are abraded. Identification is straightforward given the color of the upperparts, including the white edges to the flight feathers. Note the grayish sides to the breast, becoming whitish at the legs.*

BRIAN SMALL

Figures 9. This cassinii, *photographed in April 1989 in California, is more boldly marked than the individual in Figure 4, with a grayer head and bolder spectacles, but it still is not as bold as a typical* solitarius.

snow-white. The breast is usually smudged with some grayish, contributing to the overall impression of a bird with "dingy" underparts. The greenish color on the flanks usually extends up to include the sides of the breast. Although most *cassinii* have green flanks, many birds show yellow. On some individuals, this color extends out onto the vent as in *solitarius*. Of interest, a series of specimens taken in Idaho (now at USNM), close to the range of *plumbeus*, are decidedly duller than most specimens taken in the coastal states.

Plumbeous Vireo. This is a boldly marked but not very colorful race. In most *V.s. plumbeus*, the entire upperparts are lead-colored (Figures 5 and 8). The head is dark, which makes the spectacles a particularly obvious feature. The wings are also distinctly marked with two bold wingbars. On a few individuals, most likely fall immatures, a slight greenish tint may be seen on the rump and uppertail coverts, but this color can be observed only with excellent views. The upper back, however, is always gray. All edges to the flight feathers are whitish.

The underparts are generally pale and uniform. Most individuals have gray at the sides of the breast; a majority of birds are otherwise white below. Some birds have a dull yellow wash on the lower flanks. This feature is most common in fall, but can still be visible in spring on a few individuals. Although this yellow lacks the intensity shown by the previously described races, it is important to note that the presence of yellow does not eliminate *plumbeus*.

Vocalizations

Despite some mention in recent literature (e.g., NGS 1987) and one good commercial recording (Barlow 1981), there is a need for thorough research on the vocalizations within this group. Songs are particularly difficult to describe and are subject to interpretation in many cases. Nevertheless, some general comments can be made that may be of help in the field. The songs of these groups are similar: two-note components that are mostly up-slurred but countered with down-slurred notes. *V.s. solitarius* is more musical and rather methodical. J.V. Remsen, Jr. (pers. comm.) describes their song as similar to Red-eyed Vireo *(V. olivaceus)*, differing by having notes more irregularly delivered (more slowly and not repeated or paired) and by some of these notes having a greater upward inflection. The song of *V.s. cassinii*, on the other hand, is quicker and more burry, less musical. *V.s. plumbeus* is somewhere in between though closer to *cassinii*, recalling Yellow-throated Vireo *(V. flavifrons)*. Recordings are available on the National Geographic Society audio tapes, *Bird Songs*, and, especially, on Barlow (1981).

All Solitary Vireos give a call best described as a series of descending and rather harsh notes. This call is like that of Yellow-throated Vireo, but is very different from that of Gray Vireo.

Other Subspecies

Oberholser (1974) recognized yet another race for the U.S., *V.s. jacksoni*, and included it in the *plumbeus* complex. Phillips (1991), however, stated that the type-specimen was in molt, bringing the measurements into question.

Several additional races in Mexico and Central America are also of questionable validity. There is widespread disagreement on the taxonomic arrangement of the complex, and a complete study is needed. Some of these races are:

V.s. lucasanus, from the mountains of southern Baja California, has flank color and body size more like *cassinii* than *plumbeus* but with a larger bill than *cassinii*. There seems to be some plumage variation since specimens taken at the same season vary in brightness. Many individuals are as bright as the "average" *cassinii;* others look as dull as some *plumbeus*. I suspect that these differences are age-and-sex related; if so, that may be why some people return from Baja reporting breeding *cassinii* and others reporting breeding *plumbeus*.

V.s. montanus, found from southeastern Oaxaca and Chiapas to El Salvador and Honduras, is near *cassinii* in color but may be longer tailed. Some birds are as boldly marked as many *solitarius*.

V.s. notius, from southern Mexico to at least Belize, has the shorter wings of *montanus*, but the color is nearer to *plumbeus*. In looking at specimens, I thought that the females were more likely to have green backs and yellow flanks, whereas spring males were more likely to be duller, almost within the range of *plumbeus*.

Identification Problems

Blue-headed versus Cassin's. The key identification criteria between Blue-headed (including *V.s. alticola)* and Cassin's Vireos, in order of importance, are as follows: cheek/throat contrast, head color, crown/back contrast, and the extent of white in the tail. Other marks, such as the color of the wingbars, extent of yellow on the vent, and the whiteness of the breast, are of less value. These secondary features are most

PETER LATOURRETTE

Figure 10. This V.s. cassinii *is rather bold for this subspecies and might easily be identified as a* solitarius. *It is distinguishable by the paler head and cheek than in Blue-headed (note the weak contrast as it blends into the lower auricular area). The color along the sides, a washed-out green, is paler than in almost all* solitarius *and scarcely extends to the vent. Cupertino, California, May 1982.*

obvious on boldly marked birds, where the primary features mentioned above are more accurate in any case. On intermediate birds, there is too much variation to put much stock in any of these secondary features.

Birds with a sharply-defined blue-gray or dark-gray head that contrasts markedly with a white throat and green back are *solitarius* (cover). Those with green heads with no contrast with the back and with a dingy white throat are *cassinii*. For intermediate birds, the only mark that seems to define *solitarius* consistently is the white throat contrasting with the dark cheek. Even in the cases where green is on the cheek of *solitarius,* the cheek is still much darker than the throat, the sides of the breast, and the back (where the rear border of the auriculars meets the scapulars), and it contrasts markedly with these areas. On intermediate birds, this contrast between the auriculars and the shoulder is often a good field mark. On *cassinii,* this contrast is usually diffuse, with the auricular color blending into the back color (Figure 4).

The exact amount of cheek contrast may be difficult to discern accurately, as even the dullest of *cassinii* show contrast. It is a matter of degree, and previous experience with both forms is necessary. I cannot overemphasize the need to be cautious, as brief views or marginal lighting will greatly increase the chance of error (Figure 10). Recently, I studied a bird in eastern California that struck me as being white below, highlighting the contrast with the cheek. I studied it for ten minutes before getting the views that I needed, which included getting the sun behind me. At this point it became clear that it was a bright *cassinii*. This type of mistake is an easy one to make.

MATT HEINDEL

Figure 11. This V.s. solitarius *is somewhat worn and dull, as would be expected in late July, when photographed in Nova Scotia. The dark cheek contrasting with the bright white throat and green scapulars are excellent marks and visible even in duller individuals.*

Late-summer *solitarius* (particularly females, representing the dull extreme) will be a pitfall to the unwary observer looking for vagrant *cassinii* in eastern North America (Figure 11). Fortunately, most vagrant *cassinii* would be likely to turn up between September and November, after all Solitary Vireos should have finished their molt.

Cassin's versus Plumbeous. The dullest *cassinii* (Figures 7 and 12) can look similar to some *plumbeus*. Dull Cassin's may prove to be mostly immatures just prior to their second year. The green tones can be faded, as can the flank color. Similarly, some *plumbeus* may show some yellow near the legs and in summer may have spectacles and wingbars that are less bold (Figure 8). Identification is usually possible as long as plumage variation is understood. Some birds, however, may not be assignable to race even in the hand.

The key characters here are the color of the back, sides (and the extent of this color), and flight-feather edgings. Birds with green on the upper back or head or having extensive green or yellow along the flanks and the sides of the breast are *cassinii*. If the bird is entirely gray above with no yellow below, it is almost certainly *plumbeus*. To separate dull birds, look for any greenish tones to the upperparts, particularly on the back, which would indicate *cassinii*. Second, check for color at the sides of the breast. Invariably, the *plumbeus* that show yellow at the flanks do not have any on the sides in front of the wingbars. Some *plumbeus* may show a hint of olive or gray at the sides of the breast, but they lack yellow there (Figures 5 and 8). Further, the olive is restricted to the sides of the breast and does not continue down the flanks. *V.s. cassinii,* on the other hand, usually has this greenish color from the sides of the breast to the legs, although on some birds it may be faint (Figure 12). The majority of *plumbeus* with any yellow on the flanks have a very pale yellow wash restricted to the area near the legs. Finally, the edges of the flight feathers should be checked. They are always whitish in *plumbeus* (Figure 5) but are usually yellowish or greenish in *cassinii* (Figure 4). The

color of the underwing coverts, which is sometimes seen on perched birds (at the bend of the wing), has similar differences. The white edges to the rectrices are typically more extensive and are brighter, thus more noticeable, in *plumbeus* than in *cassinii*. Only the brightest *cassinii* match the typical *plumbeus* tail pattern, and these birds are easily separated by their green backs and yellow (or green) sides.

Structurally, several differences may be of use. There is a narrow range of overlap in wing, tail, and bill measurements. On average, however, *plumbeus* is longer-winged and larger-billed than *cassinii*. It also has a slightly longer tail. Experienced observers can detect these differences on *extreme* individuals. Oberholser (1974) is a good resource for those birders wanting specific measurements.

Again, lighting is a key. I have been involved in many cases where *plumbeus* was being claimed because the birds "looked gray." Better views showed a slight greenish tinge to the upper back and some greenish tones along the sides that extended to the sides of the breast. Although it is hard to quantify, there is a difference in the shade of gray between worn *cassinii* and *plumbeus*. On the former, the color is a darker gray. A bird viewed while in the shade, however, will often appear darker than it really is, or the color may be muted. Similarly, if the sun is not at your back, the color you "see" may not be entirely representative of what is really there. Light filtering through and reflecting off green foliage can make a gray-and-white bird look slightly greenish or yellowish. Finally, identifying photographs can be difficult because of artificial or indirect lighting as well as the effects of exposure and of film type. To illustrate this problem, one of the photographs of Solitary Vireo in Farrand (1983) is mislabeled. Although assigned to the "Rocky Mountain race" (i.e., *V.s. plumbeus*), it is in fact a *cassinii*. Note the greenish tones on the upper back, dull yellowish edges to the remiges, and the olive sides to the breast, which is faint but present down the flanks. Also, the bill is on the small side for *cassinii*, too small for *plumbeus*.

Plumbeous versus Gray Vireo. This identification is simple, given an understanding of field marks and behavior. Key physical characteristics that separate these two species are eye-ring/spectacles, wingbars, underpart coloration and pattern, and wing/tail length. Gray Vireo has an eye-ring but lacks the spectacles of *plumbeus*. The eye-ring is whitish and thin, and the lores are pale gray on Gray, and the crown is a paler gray, resulting in a bird with far less contrast. Gray Vireos usually have only the greater coverts tipped white, resulting in only one

BRIAN SMALL

Figure 12. This washed-out bird looks like plumbeus *but is, in fact, a dull* cassinii. *Keys to this bird's identity are the slight greenish wash at the sides (barely visible below the wing) and, especially, at the base of the tail. There is also a hint of olive where the auriculars meet the back. Dull birds in spring can be difficult to identify. This problem is compounded when trying to identify photographed birds, particularly those photos using artificial light, which tends to wash out color. Riverside County, California, May 1991.*

SUMMARY: IDENTIFICATION CRITERIA OF THE SOLITARY VIREO COMPLEX

	solitarius/alticola	*cassinii*	*plumbeus*
Head color	Blue-gray to gray or slaty gray (some *alticola*), some with green mixed with gray.	Gray mixed with green or all green.	All gray.
Upperparts	Usually entirely bright green or bright green with gray mixed in; some *alticola* have slaty backs.	Entirely green, usually not as bright as *solitarius*, except some fall birds.	Usually entirely gray. Some have slight greenish tinge to rump.
Flight-feather edges	Wingbars usually yellow, sometimes greenish or whitish. Extensive white in rectrices. Edges to rectrices usually greenish.	Wingbars greenish-yellow, but can be yellow or whitish. Rectrices and secondaries usually edged greenish.	White wingbars usually bold. White edges to flight feathers usually bolder than in other groups.
Underparts	Bold white throat (and often the entire center of the underparts). Usually bright lemon yellow along sides, vent, etc., sometimes greenish-yellow.	Dingy white throat and underparts. Flanks usually greenish-yellow, occasionally bright yellow.	Rather bold white throat, but dingy underparts. Usually grayish along flanks but can have olive at sides of the breast or pale yellow along lower flanks.

wingbar or less commonly also a weak upper wingbar, whereas *plumbeus* almost always shows two bold white wingbars. Below, Gray Vireos are mostly pale gray. *V.s. plumbeus* generally show gray sides to the breast that contrast with a white throat that contrasts in turn with a dark gray cheek. This contrast is much less defined in Gray Vireo. Structurally, the Gray has a short-winged and long-tailed look, whereas *plumbeus* just looks large to me but not out of proportion. Whereas tail length is almost equal between these two species, the wing of *plumbeus* averages 20 percent longer, meaning that the primary projection is very different between these two species. Behavior may also be of help in an identification. Gray Vireos often behave in a manner that recalls a wren or a gnatcatcher. They often flit through vegetation cocking and waving their tails, further enhancing the long-tailed look. Zimmer (1985) and Rosenberg (1990) cover this identification problem well.

Summary

This article discusses the three main subspecies groups of Solitary Vireo that are found in the U.S. and Canada, with the main emphasis on giving the reader the necessary information to identify birds to race. Much of this process can be straightforward, given an understanding of plumage variation and good viewing conditions. I am hopeful that appropriate caution will be used with extralimital sightings, because working with subjective marks—such as those cited here—can lead to misidentifications. Further, a review of specimens convinced me that some birds cannot be identified confidently in the field.

Acknowledgments

This article would not have been possible without the cooperation of many people, particularly those who so eagerly offered their help at various museums. I am particularly indebted to J.V. Remsen, Jr., at the Museum of Natural Science at Louisiana State University (LSUMZ). Remsen, Donna Dittmann, Steve Cardiff, and Curtis Marantz shared their experiences, records, and unpublished papers. Kimball Garrett at the Los Angeles County Museum of Natural History also offered valuable assistance. Phil Angle and James Dean assisted me on my visit to the U.S. National Museum (USNM). Steve N.G. Howell was extremely helpful in sharing his knowledge of the winter distributions of the members of this complex. I am grateful to Jo Heindel and Peter Pyle for their helpful suggestions. The paper has been greatly improved by helpful comments from many of *Birding*'s technical reviewers.

Literature Cited

AOU. 1957. *Check-list of North American Birds.* 5th ed. Washington, D.C.

———. 1983. *Check-list of North American Birds.* 6th ed. Washington, D.C.

Andrews, R., and R. Righter. 1992. *Colorado Birds: A Reference to their Distribution and Habitat.* Denver Museum of Natural History, Denver.

Armistead, H.T. 1989. Middle Atlantic Coast region. *American Birds* 43: 79.

Aubry, Y., and P. Bannon. 1996. Quebec region. *National Audubon Society Field Notes* 50: 19.

Barlow, J.C. 1981. *Songs of the Vireos and Their Allies.* Ara Records, No. 7. Gainesville, Florida.

———. 1989. The Solitary Vireo *(Vireo solitarius)* in Alberta: One species or two? *Wilson Bulletin* 101: 682.

Bent, A.C. 1950. *Life Histories of North American Wagtails, Shrikes, Vireos, and Their Allies.* Dover Publications, New York.

Brock, K.J. 1994. Middlewestern Prairie region. *National Audubon Society Field Notes* 48: 305.

Dunn, J. 1976. The races of the Solitary Vireo. *Western Tanager,* September 1976, p. 5.

Dunn, J.L., and K.L. Garrett. 1995. White-crowned Sparrow subspecies: Identification and distribution. *Birding* 27: 182–200.

Farrand, J., Jr. 1983. *The Audubon Society Master Guide to Birding.* v. 3. Alfred A. Knopf, New York.

Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution.* Los Angeles Audubon Society, Los Angeles.

Gilligan, J. 1991. Pacific Northwest region. *American Birds* 46: 472.

Godfrey, W.E. 1986. *The Birds of Canada.* rev. ed. National Museums of Canada, Ottawa.

Gosselin, M., R. Yank, and Y. Aubry. 1989. Quebec region. *American Birds* 43: 453.

Howell, S.N.G., and S. Webb. 1995. *A Guide to the Birds of Mexico and Northern Central America.* Oxford University Press, New York.

Imhof, T.A. 1989. Central Southern region. *American Birds* 43: 494.

Johnson, N.K. 1995. Speciation in vireos. I. Macrogeographic patterns of allozymic variation in the *Vireo solitarius* complex in the contiguous U.S. *Condor* 97: 903–919.

Johnson, N.K., and K.L. Garrett. 1974. Interior bird species expand breeding ranges into southern California. *Western Birds* 5: 45–56.

Johnson, N.K., R.M. Zink, and J.A. Marten. 1988. Genetic evidence for relationships in the avian family Vireonidae. *Condor* 90: 428–445.

Lasley, G.W., and C. Sexton. 1989. Texas region. *American Birds* 43: 132.

LeGrand, H.E., Jr. 1990. Southern Atlantic region. *American Birds* 44: 76.

Monson, G., and A. Phillips. 1981. *Annotated Checklist of the Birds of Arizona.* 2d ed. University of Arizona Press, Tucson.

NGS. 1987. *National Geographic Society Field Guide to the Birds of North America.* 2d ed. National Geographic Society, Washington, D.C.

Oberholser, H.C. 1974. *The Bird Life of Texas.* University of Texas Press, Austin.

Ogden, J.C. 1990. Florida region. *American Birds* 44: 259.

Peterjohn, B.G. 1988. Middlewestern Prairie region. *American Birds* 42: 1297.

———. 1990. Middlewestern Prairie region. *American Birds* 44: 1141.

Phillips, A.R. 1991. *The Known Birds of North and Middle America,* Part II. Published by the author.

Pyle, P., S.N.G. Howell, R.P. Yunick, and D.F. DeSante. 1987. *Identification Guide to North American Passerines.* Slate Creek Press, Bolinas, California.

Remsen, J.V., Jr., S.W. Cardiff, and D.L. Dittmann. 1996. Timing of migration and status of vireos (Vireonidae) in Louisiana. *Journal Field Ornithology* 67: 119–140.

Roberson, D. 1985. *Monterey Birds.* Monterey Peninsula Audubon Society, Monterey, California.

Rosenberg, G.H. 1990. Arizona birding pitfalls, Part 1: Species we take for granted. *Birding* 22: 120–129.

Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. *Birds of the Lower Colorado River Valley.* University of Arizona Press, Tucson.

Sibley, C.G., and B.L. Monroe, Jr. 1990. *Distribution and Taxonomy of Birds of the World.* Yale University Press, New Haven.

Sibley, D. 1993. *The Birds of Cape May.* Cape May Bird Observatory, Cape May, New Jersey.

Tweit, B., and S. Summers. 1994. Oregon/Washington region. *National Audubon Society Field Notes* 48: 336.

Unitt, P. 1984. *The Birds of San Diego County.* San Diego Society of Natural History, San Diego.

Veit, R.R., and W.R. Petersen. 1993. *Birds of Massachusetts.* Massachusetts Audubon Society, Lincoln, Massachusetts.

Wilson, A. 1810. *American Ornithology* 2: 143.

Zimmer, K.J. 1985. *The Western Bird Watcher.* Prentice-Hall, Englewood Cliffs, New Jersey.