

Figure 1. Current and historical taxonomic breakdown of *Anthus rubescens*.

A.O.U. 1957

Water Pipit (*Anthus spinoletta*)

A.O.U. 1983

Water Pipit
(*A. spinoletta*)

Rock Pipit
(*A. petrosus*)

Buff-bellied Pipit (B.O.U.)
or
American Pipit (A.O.U.)
(*A. rubescens*)

Subspecies
A. s. spinoletta
A. s. coutelli
A. s. blakistoni

A. p. petrosus
A. p. littoralis

"American Pipits"

A. r. rubescens
A. r. alticola
A. r. pacificus

"Siberian Pipit"

A. r. japonicus

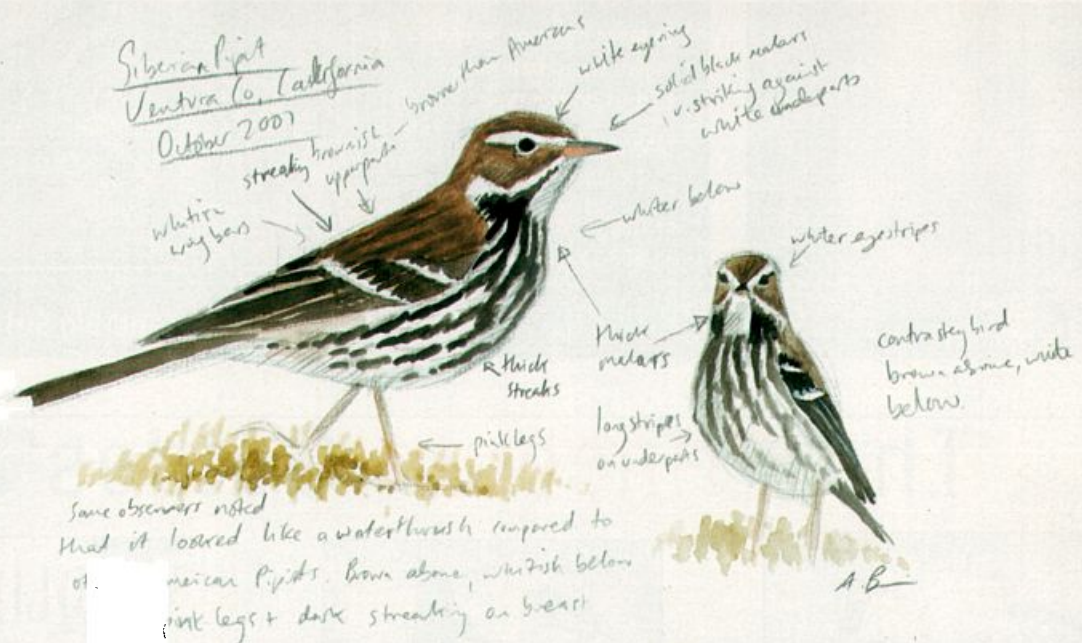


Figure 2. Field-based sketch of a Siberian Pipit seen on 29 October 2001 in Ventura, California. *Illustration by Andrew Birch.*



Figure 3. Field-based sketches of a Siberian (left) and American (*A. r. pacificus*) Pipit (right) seen on 23 November 2001 near Perris, California. *Illustration by Cin-Ty Lee.*

Notes on the distribution, vagrancy, and field identification of American Pipit and "Siberian Pipit"

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Introduction

The pipit *Anthus rubescens*—called American Pipit by the American Ornithologists' Union (A. O. U. 1998), Buff-bellied Pipit by the British Ornithologists' Union (B. O. U. 1986)—is currently divided into four subspecies: *japonicus*, *pacificus*, *alticola*, and *rubescens* (A.O.U. 1957). The first subspecies, *japonicus*, may be a candidate for full-species status according to the American Ornithologists' Union (A.O.U. 1989) because of its separate breeding range in eastern Asia and its divergent plumage characters. The other three subspecies (*pacificus*, *alticola*, and *rubescens*) breed entirely within North America and western Greenland and resemble

each other closely. For this reason, we refer to *A. r. japonicus* as "Siberian Pipit" in this paper and to the three North American subspecies collectively as "American Pipit" (Fig. 1; see illustrations of basic-plumaged birds on front cover of the journal). We believe that this choice of common terminology will reduce confusion if Siberian and American Pipits are accorded status as separate species in the future. When we consider both forms together, we here employ the name preferred for all four in the Palearctic—the "Buff-bellied Pipit complex."

Siberian Pipit is a vagrant to Europe, the Middle East, and along the Pacific coast of North America, whereas American Pipits vagrate to western Europe (*rubescens*) and are possibly rare winterers in eastern Asia (*pacificus*). In greater detail, however, the vagrancy patterns of Siberian and American Pipits are poorly known, as there is a gap in the literature regarding the subspecific identification of the members of the Buff-bellied Pipit complex. To our knowledge, the only recent sources to address the complex are Parkes (1982) and Phillips (1991). However, both sources focus primarily on identification of the three American subspecies in alternate plumage. Alström and Mild (1996), Lewington et al. (1991), and Beaman and Madge (1998) discuss the identification of Siberian Pipit in relation to the *rubescens* subspecies of American Pipit but do not address the degree of plumage variation within American Pipit subspecies. This article attempts to remedy these gaps in the literature.



Figures 4. This typical Siberian Pipit shows the flaring submalar stripe, heavily streaked underparts (especially the sides), white underparts, white eye-ring, white median coverts, and pale legs. Though a bit paler than some individuals (cf. Figs. 8, 9), the bird is typical in other respects. Photographed along the Tamu River, Tokyo, Japan 31 January 1998. Photograph by Takashi Koike.



Figure 5. The same Siberian Pipit as in Figure 4, showing the eye-ring and wingbars to better advantage. *Photograph by Takashi Koike.*



Figure 7. This Siberian Pipit tends toward the pale end, and the eye-ring is not especially pronounced, but other characters indicate Siberian. Photographed in Japan in winter, date unknown. *Photograph by Takashi Koike.*



Figure 8. This photograph depicts a Siberian Pipit with fairly strong contrast between dark brown upperparts and whitish underparts, which in turn contrast with dark streaking below. The streaks of the underparts coalesce longitudinally, giving the bird a striped appearance. The white tips to the median coverts contrast not only with the dark upperparts but also with the slightly buffy greater median coverts, a common feature in Siberian Pipits. Photographed 15 December 1996 in Japan. *Photograph by Tetsu Sato.*



Figure 6. Another Siberian Pipit, photographed 1 December 2001 in South Korea. They eye-ring is well-defined, likewise the coalescence of dark streaks below the malar area and the starkly marked underparts against a whitish background. *Photograph by Kim Hyun-Tae.*

While plumage variation within the various American Pipit subspecies probably precludes field identification of individuals to the level of subspecies, at least at a reasonable level of confidence, separating Siberian from American Pipits in basic plumage within the context of subspecific variation in the three American Pipit subspecies is feasible (cf. Sibley 2000). Our analyses below incorporate examinations of approximately 300 museum specimens (Museum of Vertebrate Zoology, University of California, Berkeley; Harvard Museum of Comparative Zoology; Los Angeles County Natural History Museum), hundreds of hours of field observations (primarily of American Pipits; several field observations of Siberian Pipit in the United States), and examination of approximately 15 photographs of Siberian Pipit.

Systematics and nomenclature

In this section, we review the historical taxonomy of the Buff-bellied Pipit complex in brief (Fig. 1). In 1957, the Buff-bellied Pipit complex was considered conspecific with a number of Eurasian forms under the hierarchical species Water Pipit (*A. spinoletta*). Water Pipit was subsequently split into three subspecies: Buff-bellied Pipit (*A. rubescens*), Rock Pipit (*A. petrosus*), and Water Pipit (*A. spinoletta*) (B. O. U. 1986). Vaurie (1959), Hall (1961), and Williamson (1965) originally split *A. spinoletta* into two ecological groups, "Water Pipits," which breed in mountainous regions in Europe, Asia, and North America, and "Rock Pipits," which breed along rocky coastlines in northwestern Europe. These two groups were considered to be separate species by Bannerman (1953) and Oreel (1980). However, Nazarenko (1978) showed that two subspecies of the "Water Pipits," *blakistoni* and *japonicus*, overlapped in terms of their breeding range in central Asia but that they preferred different habitats. As a result of this study, Glutz (1985) broke down the "Water Pipits" into two more species, "Water Pipit" and "Buff-bellied Pipit," producing a total of three species; this split is supported by genetic studies as well (Zink et al. 1995). Throughout the 1980s, in fact, many other authorities supported this new taxonomic arrangement: Devillers (1980), the British Ornithologists' Union Records Committee (1986), Alström and Mild (1987), and Knox (1988) all suggested that the entire complex be divided into three species: Rock (*A. petrosus*), Water (*A. spinoletta*), and Buff-bellied Pipit (*A. rubescens*). Alström and Mild (1996) further showed that Rock, Water, and Buff-bellied Pipits can be distinguished from each other based on plumage characters, regardless of species status. The latter is the taxonomy also currently recognized by the American Ornithologists' Union (1989).

Within each of these three species, there is geographic and subspecific variation. Rock Pipit (*A. petrosus*) consists of nominate *petrosus*—breeding in Ireland, Britain, and northwestern France—and *littoralis*, breeding in Fennoscandia and northwest Russia (Cramp 1988). Williamson (1965) also recognized two other Rock Pipit races potentially worthy of subspecific status: "*kleinschmidti*" (breeding on the Faeroe Islands and possibly the outer Scottish islands) and "*meinertzhageni*" (breeding on the Outer Hebrides). However, the British Ornithologists' Union Records Committee (1986) did not recognize these forms. The Water Pipit (*A. spinoletta*) consists of three subspecies: *A. s. spinoletta*, breeding in southern and central Europe; *A. s. coutellii*, breeding in Asia Minor; and *A. s. blakistoni*, breeding in Central Asia. The Buff-bellied Pipit (*A. rubescens*) complex currently consists of *A. r. japonicus*, *A. r. pacificus*, *A. r. alticola*, and *A. r. rubescens*.

DISTRIBUTION OF SUBSPECIES IN THE BUFF-BELLIED PIPIT COMPLEX

Breeding range

The breeding and wintering ranges of the four subspecies of Buff-bellied Pipit are poorly understood owing to difficulty in subspecific identification.



Figure 9. Though a bit soft in focus, this photograph captures all of the features of Siberian Pipit nicely: the very dark streaks below, darker than the upperparts' color, extend noticeably along the flanks. The streaks below the malar come together and flare to the side of the neck, similar to Richard's Pipit (*Anthus richardi*). Photographed 15 January 1993 in Miyagi Prefecture, Japan. Photograph by Toru Akiba.



Figure 10. Siberian Pipits in the collection at the Museum of Vertebrate Zoology, Berkeley. Note the heavy ventral streaking (almost striping) in all individuals, all of which are in basic plumage. Photograph by Cin-Ty Lee.



Figure 11. American Pipits of the subspecies *pacificus* in the collection at Museum of Vertebrate Zoology, Berkeley. The comparatively light streaking (almost spotting) of these birds never coalesces into a longitudinally "striped" appearance below, nor is the contrast with the underparts quite as strong as in Siberian. Photograph by Cin-Ty Lee.



Figure 12. American Pipit, presumably of the expected eastern subspecies *rubescens*, at North Beach, Maryland, in winter. The buffy underparts, somewhat sparsely streaked sides, the lack of a flaring, dark submalar stripe, the buffy wing-bars, and the gray legs rule out Siberian Pipit. Photograph by James L. Stasz.



Figure 13. American Pipit, presumably of the expected western subspecies *pacificus*, photographed in California in winter. This bird is clearly distinguishable from Siberian Pipit by its paler streaking below (as well as the spotted appearance of the upper breast), the lack of a bold and flaring submalar stripe, the lack of strong eye-ring, the gray legs, and the relatively buffy underparts. The more oval or roundish breast spots of *pacificus* differ slightly from the more elongated breast spots on *alticola* and *rubescens* (cf. Fig. 12). Photograph by Jim Gain.

The Siberian Pipit (*A. r. japonicus*) breeds in central and eastern Siberia from Tunguska to Kamchatka and south to northern Sakhalin and the Kurile Islands (Gabrielson and Lincoln, 1959, Dement'ev and Gladkov 1970, A.O.U. 1989). It is not thought to breed in Alaska (A.O.U. 1991).

The *pacificus* subspecies breeds in the Pacific Cordillera in western North America from the mountains of Oregon north to Alaska (Miller and Green 1987, Campbell et al. 1997), including the Aleutian (Gabrielson and Lincoln 1959) and Pribilof Islands (Thompson and Delong 1969). Overall, the breeding range is primarily considered to lie west of the Rocky Mountains.

The subspecies *alticola*, sometimes known as the Rocky Mountain race, breeds throughout the Rocky Mountains and outlying ranges from southern British Columbia and Montana, south to New Mexico and Arizona, and west to the eastern Great Basin Ranges (Miller and Green 1987). In the southern part of its range, it has bred in the White Mountains of Arizona and the Sangre de Cristo Range of New Mexico (Hubbard 1978). More recently, it has been discovered as a breeder in California, occurring in the Sierra Nevada as far north as Mono County and as far south as Tulare County (Miller and Green 1987). Isolated breeding pairs have also been reported from the summit of Mount San Geronio in the San Bernardino Mountains, California (McCaskie 1978, Miller and Green 1987, Miller 1988), and breeding is suspected above timberline in the White Mountains and on nearby Telescope Peak in the Panamint Mountains (Small 1994). Howell and Webb (1992) reported several birds, presumably of this subspecies, at 2450 m in the Sierra San Pedro Martir, Baja California, including a male engaged in song flights through June, well past the time of spring migration. A specimen of *alticola* was collected 16 April 1942 at 1700 m elevation from Laguna de Las Ranas in El Salvador (University of California, Berkeley Museum of Vertebrate Zoology #86275).

The subspecies *rubescens* breeds from northern Yukon east to western Greenland, and south to southwestern Yukon, northern British Columbia, Northwest Territory, northern Manitoba, northern Ontario, northern Québec, southern Labrador, and Newfoundland (A.O.U. 1983). Breeding may also occur in northern Alaska based on the presence of several specimens of this subspecies collected during the summer at Point Barrow, Alaska (University of California, Berkeley, Museum of Vertebrate Zoology #129421, 129422, 134735). Isolated populations of *rubescens* breed at higher elevations on Gaspé Peninsula and on Mount Katahdin, Maine (A O U 1983) and Mount Washington, New Hampshire (Petersen 1991, Veit and Petersen 1993). A population near Hudson Bay was considered by Oberholser (1974) to be a separate subspecies (*A. r. ludovicianus*), but is essentially identical to *rubescens* and has not been accepted by the American Ornithologists' Union. Another potential subspecies, *A. r. geophilus*, breeding primarily in coastal southern Alaska, was proposed by Oberholser (1974) based on slight differences in plumage, but this subspecies is also not recognized by the American Ornithologists' Union, as it is only marginally distinct from *pacificus*.

Wintering Ranges

Siberian Pipit winters in eastern China and Japan (Gabrielson and Lincoln 1959, Dement'ev and Gladkov 1970, A.O.U. 1983, Brazil 1991), Nepal (Inskipp and Inskipp 1985), Pakistan (Grimmett et al. 1999), northern India, northern Burma, northern Vietnam, southern China (A.O.U. 1983), Hong Kong (King and Dickenson 1975), Taiwan (Chang 1980), and South Korea (Gore and Won 1971). It has been recorded as a vagrant as far south as Myanmar (Burma), northeastern Thailand, and western Tonkin, and it may be regular enough in Israel to be considered a rare winterer (Shirihai 1996).

American Pipits winter in California, Arizona, New Mexico, and Texas, south through Baja California and Mexico to Guatemala (A.O.U. 1983,

Howell and Webb 1995), and east through the Gulf states to the Atlantic coastal plain (Root 1988). Small numbers of wintering birds are found as far north as southern British Columbia, northern Great Basin, southern New England, and rarely in the Great Plains (Root 1988, Veit and Petersen 1993, Campbell et al. 1997). On the southern end of range, there are multiple records of unknown subspecies from the Bahamas and Jamaica (A. O. U 1998), two records of the species from Belize, both near Punta Gorda (singles 3 November 1999 and 5 November 2001; H. Lee Jones, in litt.), and four records from El Salvador, the most recent being 2 January (one) and 7 April 2002 (5) (Jones 2002a, 2002b). We know of no reports from Honduras, Nicaragua, Costa Rica, or Panama.

The breakdown of the wintering range of American Pipits by subspecies is poorly demarcated at present, primarily because of the lack of knowledge in identifying the subspecies and the decline of specimen collection in the later twentieth century. As we discuss in subsequent sections, the field identification of basic-plumaged American Pipits to the subspecies level is difficult and frequently impossible. Thus, the historical descriptions of subspecific wintering status, which we outline below, should be considered tentative.

In general, *rubescens* accounts for most of the eastern wintering populations (Oberholser 1974). The A.O.U. (1957) described *rubescens* as wintering from "Texas, Arkansas, Tennessee, West Virginia (Upshur County), and the lower Delaware Valley south through eastern Mexico to Guatemala, the Gulf coast, and Florida." Oberholser (1972) stated that this subspecies was a common winterer in north-central Texas and as far west as El Paso. Pulich (1988) confirmed that at least some of the specimens taken in Texas were of this subspecies. In Mexico, Miller et al. (1957) reported that this subspecies winters primarily on the Caribbean slope.

Conversely, *pacificus* probably accounts for most of the Pacific Coast populations (Grinnell and Miller 1944), with the A.O.U. (1983) stating that wintering occurs from "southern coastal British Columbia, Oregon, west-central Nevada (Lahontan Valley), and southern Utah to Baja California and western Mexico (south to Oaxaca)." Monson and Phillips (1981) were of the opinion that all wintering pipits in Arizona were of this subspecies. Oberholser (1972) claimed that *pacificus* is a fairly common winterer in Texas, although Pulich (1988) recommended that its status in Texas be reinvestigated. Exactly how far east *pacificus* ranges during winter is unknown.

According to the A.O.U. (1983), the wintering range of *alticola* is largely unknown, but it has been recorded in December from Arizona. (Monson and Phillips [1981], however, were of the opinion that winterers in Arizona are *pacificus*.) Grinnell and Miller (1944) described *alticola* as a rare winter visitant to California but did not elaborate. Their account includes specimens collected from early to mid-April. Five *alticola* specimens collected between 4 March and 12 April in coastal California (Alameda, Santa Clara, and Santa Cruz Counties) are in the University of California, Berkeley MVZ collections (#5334, 37925, 56704, 90691, 146678). Oberholser (1974) indicated that this subspecies had occurred in Texas on 22 March and 10 April. However, these dates coincide with the timing of spring migrants (see below), and thus do not necessarily imply that wintering occurs in Texas. Pulich (1988) was unable to relocate these specimens to verify the report. Miller et al. (1957) state that this subspecies is a little-known winter visitant in Mexico, citing records from Oaxaca, Guanajuato, the Distrito Federal, San Luis Potosí, and Tlaxcala. The lack of knowledge on the wintering status of *alticola* is partly due to the difficulty in identifying the American Pipit subspecies in basic plumage.

TIMING OF MIGRATION AND VAGRANCY

The migratory statuses of Siberian and American Pipits are described here. The vagrancy of American Pipit subspecies is described as a whole because so little is known about the distribution and migratory status at

the subspecies level. Phillips (1991) provides some discussion of the subspecific breakdown of migratory and vagrancy status.

American Pipits in western North America

In western North America, American Pipits are on the move from their breeding grounds by late August in Alaska and have mostly departed by early September. Peak movements occur in the northern part of British Columbia during early September and from late September to early October in the southern part of the province (Campbell et al. 1997). Interestingly, fall transients are about eight times more numerous along the coast than in the interior of British Columbia. Migration is largely over in British Columbia by the end of October, with stragglers continuing into early November (Campbell et al. 1997). Wintering birds arrive in California and Arizona by mid- to late September, with numbers peaking in mid-October (Grinnell and Miller 1944, Garrett and Dunn 1981, Roberson 1984, Small 1994). Winter arrivals as early as the first week of September are considered exceptional (Rosenberg et al. 1991, Small 1994), with arrivals in late August even more so (Grinnell and Miller 1944). A single bird on 1 July from Lassen Peak in northern California was regarded by Grinnell and Miller (1944) as an early fall transient, but it may have been trying to summer, considering that breeding colonies exist in the Oregon Cascades not far to the north. The earliest arrival date for Sonora, Mexico is listed as 21 September by Russell and Monson (1998).

Winterers in the southern part of their range (e.g., southern California) typically stay until mid-April, with a few lingering until early May (Rosenberg et al. 1991). Small (1994) states that spring transients in California occur from mid-April into May. However, a sharp increase in the number of birds between late March and April in British Columbia (Campbell et al. 1997) suggests that wintering birds are on the move well before mid-April, and in all likelihood the spring migration is protracted. In British Columbia, Campbell et al. (1997) noted that the total number of records of spring transients is lower than the number of fall transients by a factor of roughly three. Breeding individuals arrive by the last week of April in southeastern Alaska and by the first week of May in northern Alaska (Gabrielson and Lincoln 1959).

The local populations (most likely *alticola*; Miller and Green 1987) that breed in the Sierra Nevada and San Bernardino Mountains in California arrive on breeding grounds between mid-April and early May (Miller 1988). These stay until late September but occasionally into November (see references in Small 1994).

American Pipits in eastern and central North America

Individuals in the eastern two-thirds of North America are on the move from their breeding grounds in northern Canada by late August, as evidenced by arrivals of fall transients in Ontario between the first week of September through October (Speirs 1985). Sadler and Myres (1976) noted movements during late August in Alberta. In the southern part of Ontario, the earliest arrivals occur in early September and peak during mid- to late October (Speirs 1985). Interestingly, in New York, earliest arrivals are 2 August and 13 August in inland and coastal counties, respectively (Bull 1974), with an extreme date of 13 June (Levine 1998), numbers of transients peak in October. In Alberta, transients pass through Edmonton during the last week of September and have completely passed through by early October (Sadler and Myres 1976). In Minnesota, earliest arrivals appear by mid-September, and in Missouri by mid-September, peaking in early to middle October (Robbins and Easterla 1992). Fall transients pass through Massachusetts primarily during October (Veit and Petersen 1993), and through Cape May, New Jersey from October through November (Stone 1965, Sibley 1997).

Winterers arrive in Tennessee by early October, with exceptionally early arrivals in September and even late August (Robinson 1990); in Arkansas by late September, peaking in October and November (James 1986); in Louisiana during October (Lowery 1955); in Alabama by early October (Imhof 1962); in Florida by October (Kale and Maeher 1990); and in Texas by late September (Pulich 1988). Fall transients apparently pass through by the end of November, with stragglers or facultative migrants continuing into December through January. Small wintering flocks on the northern edge of wintering range are occasionally encountered in coastal New York, the Lower Hudson River Valley, and rarely the Finger Lakes region (Bull 1974, Levine 1998, W. R. Evans, pers. comm.), along the shores of Lake Erie (Speirs 1985), and at Cape May, New Jersey (Stone 1965, Sibley 1997). Wintering individuals have been recorded as late as February in coastal Massachusetts (Veit and Petersen 1993) and on Christmas Bird Counts in the northern Great Plains (e.g., Missouri; Robbins and Easterla 1992).

Northward migration during spring is probably protracted. In southeastern and central North America, pipits have largely departed their wintering grounds by early May (as in Alabama [Imhof 1962], Texas [Pulich 1988], and Tennessee [Robinson 1990]). However, spring transients are clearly on the move by March throughout much of the interior United States, as exemplified by peak movements during March and early April in Arkansas (James 1986), late March onward in New York (Bull 1974), and mid-March in Missouri (Robbins and Easterla 1992). At Point Pelee, Ontario spring transients pass through between late March and late May (Speirs 1985). On the southern shores of Lake Ontario, peak passage would seem to be in late April and early May (Levine 1998). In Massachusetts, spring transients pass through from late March to mid-May, with peak counts occurring in April (Veit and Petersen 1993). A curious observation is that spring transients are extremely rare at Cape May, New Jersey (Stone 1965), but this surely has to do with the peninsula's position, which is set off from the Delmarva Peninsula by the Delaware Bay. The relative scarcity of spring transients is also true on the Delmarva, which is cut off from mainland Virginia by the Chesapeake Bay (Coastal Virginia Wildlife Observatory, in litt.) Likewise, in Massachusetts, spring migrants are considerably less numerous than fall transients in Massachusetts (Veit and Petersen 1993). In Alberta, spring transients pass through during the first week of April and later (Sadler and Myres 1976), but we were unable to find information regarding the arrival of breeders in northernmost Canada. Based on arrival dates in northern Ontario around early May (Speirs 1985), it is likely that breeders arrive in northern Canada by mid- or late May. In the southern part of its breeding range, for instance at Guanella Pass in Colorado (*alticola*), pipits return during late April to early May (Conry 1978).

American Pipits: vagrancy

Published extralimital occurrences of the American Pipit subspecies are few (Phillips 1991). Grinnell and Miller (1944) documented four specimens of *alticola* taken separately during the first two weeks of April in California. Bull (1974) described a specimen of *alticola* collected in Suffolk County, New York on 10 May 1882 (AMNH 25964; Levine 1998). Grinnell and Miller (1944) reported no records of *rubescens* in California, but Rosenberg et al. (1991) suggest that one specimen collected 22 December 1902 at Yuma, Arizona might pertain to this subspecies. Extralimital occurrences of birds in the Buff-bellied Pipit complex in Bermuda probably pertain to this subspecies (A.O.U. 1973).

Farther afield, vagrant nominate *rubescens* have been reported in Germany, Italy, Iceland, Ireland, and Britain, primarily between the dates of mid-September and late October (see Evans 1994 for review). At least

one, if not both, of the Italy sightings may in fact refer to Siberian Pipits (Shirihai and Colston 1987). Two records of Buff-bellied Pipit types exist for Scandinavia, one in Norway and one in Sweden, from December and January. The Scandinavian pipits were identified as *rubescens*, but some features suggest Siberian (Brian J. Small, pers. comm.). The western North American subspecies, *pacificus*, has been recorded in Okinawa, Japan during the winters of 1982-1983 and 1984-1985 and from January to February 1987 (see Brazil 1991 for references).

There is no doubt that *rubescens* is a vagrant to Europe. However, the above compilation suggests that *pacificus* and *alticola* may also be prone to vagrancy, if the above records represent accurate identifications. In addition, one should not assume that *rubescens* does not appear on the Pacific coast during migration or even during winter.

Siberian Pipit: migration and vagrancy

According to Dement'ev and Gladkov (1970), Siberian Pipits commence southward migration during late August and early September, but the departure from breeding grounds may be quite protracted. Breeders in the mountains of Kamchatka begin their descent to lower elevations in early September, but movements continue through September. In northern Sakhalin, southward migration commences in late August/early September, but in southern Sakhalin, the southbound migrants can depart as late as mid-December, particularly in warm winters. The maritime flight from their breeding grounds in Siberia to their wintering grounds in Japan appears to occur in September and October (Dement'ev and Gladkov 1970). According to Brazil (1991), Siberian Pipits arrive in Japan between late October and November. Northward departure from Japanese wintering grounds begins in late March, with the last birds leaving by late May (Dement'ev and Gladkov 1970, Brazil 1991).

In the Palearctic, Siberian Pipit has probably occurred as a vagrant to Italy and is regularly seen in the Middle East during migration and winter (Shirihai and Colston 1987, Shirihai 1996). At Eilat, Israel, Shirihai (1996) states that Siberian Pipits arrive during late October (earliest 22nd) and depart in March to early April (latest 10th). A peak count of 60 at Eilat during the winter of 1985-1986 suggests that Siberian Pipit may in fact overwinter regularly in Israel (Shirihai and Colston 1987), although the numbers seen each winter appear to vary considerably. For example, during the winter of 1988-1989, only four were discovered in Eilat (Shirihai 1996). The Siberian Pipit is considered a very rare visitor in late fall to Hawaii (Pratt et al. 1987) and is considered casual in Iwo Jima, Turkestan, and western Alaska (A.O.U. 1989). Paul E. Lehman (pers. comm.) documented several at Gambell, Alaska during the falls of 1999, 2001, and 2002, from late August through early October. The vast number of Siberian Pipit reports from birders visiting western Alaska are undocumented and may in fact pertain to *pacificus*, which is much more likely (Thede Tobish, pers. comm.).

In North America, few Siberian Pipits have been documented away from western Alaska. The only records outside of Alaska we are aware are a number of records from California and one remarkable record from Sonora, Mexico. The latter bird pertains to a specimen taken 6 June 1958 near Naco, Sonora and reported by Monson and Phillips (1981) as an alternate-plumaged Siberian Pipit. This record represents the first North American record outside of Alaska as well as the only spring record outside of Alaska.

Approximately 18 fall vagrants have been noted in California, although supporting documentation has not been published for all of these sightings (e.g., McCaskie 1992). Some of the records are listed below. An individual found 13 October 1989 in northern California (Del Norte County) constitutes the earliest California record (Erickson et al. 1990) and coincided with an influx of Red-throated Pipits (*A. cervinus*) along the entire Pacific Coast (McCaskie 1990). During the fall of 1991, also coinciding with an

influx of Red-throated Pipits, nine Siberian Pipits may have been recorded in California (McCaskie 1992, Yee et al. 1992): one or 2 at Point Reyes (7-13 October), 3 on the Farallon Islands (13 October to 5 November), one in Bodega (10 November), one in Irvine (25 October), 2 in the Tijuana River Valley (26 October, 11 November), and one in Mission Bay (23 November).

During the fall of 2001, Nick Lethaby discovered a Siberian Pipit with a small number of Red-throated Pipits in Port Hueneme, Ventura County, California 29 October through 3 November (McCaskie and Garrett 2002). This bird was also carefully studied by Birch (Fig. 2). During the same fall, another Siberian Pipit was discovered and studied by Lee on 23 November near Perris, Riverside County, California (Fig. 3; cf. Figs. 4-10). Although the number of Siberian Pipit sightings in California is scarce, it appears that Siberian Pipit records have all coincided with influxes of Red-throated Pipits (McCaskie and Garrett 2002), and the co-vagrancy of these species is also apparent at Gambell, St. Lawrence Island, Alaska in the autumn (Lehman, pers. comm.).

Our above discussion on the vagrancy status of Siberian Pipits in North America is clearly incomplete, as there may potentially be additional sightings that were never formally submitted to rare bird records committees due to Siberian Pipit's subspecific status.

MOLT

The timing of molt is an important factor in determining the age of a bird and affects certain field marks as well (e.g., the appearance of the median and greater coverts). The molt strategy of American Pipits has been studied by Pyle (1997a, 1997b) and that of the Water Pipit (*A. spinoletta spinoletta*) by Jenni and Winkler (1994) and Williamson (1965). We are not aware of any studies conducted on the Siberian Pipit or of any systematic study of molt strategies broken down to the subspecific level of the American Pipits.

According to Pyle (1997a, 1997b), American Pipits have prebasic and prealternate molts. The first prebasic molt occurs between July and September, primarily on summering grounds. This molt is a partial molt, in which zero to all median coverts are replaced, zero to four inner greater coverts are replaced (Pyle states that about 55% of individuals replaced no greater coverts), and sometimes one to two tertials are replaced (in about 25% of the birds). No rectrices are replaced.

The first prebasic is followed by the first prealternate molt, which occurs between January and April, primarily on the wintering grounds or during migration. In the first prealternate molt, zero to four inner greater coverts are replaced, one to three tertials are replaced, and often one to two central rectrices are replaced. The second prebasic molt, after which the bird attains definitive adult plumage, is complete. The adult prealternate molt is similar to the first prealternate. For comparison, the molt strategy of the nominate race of the Water Pipit (*A. s. spinoletta*) is very much like that of American Pipits, but its first prebasic molt may differ in subtle ways. In its first prebasic molt, at most two greater coverts and at most three tertials are molted (Jenni and Winkler 1994).

Knowledge of molt strategy may sometimes allow one to recognize first-fall birds by using the presence or absence of molt limits in the median and greater coverts. Molt limits can be recognized by the contrast between juvenile and replaced feathers, the former tending to be more worn by fall migration, and the latter tending to be fresher and brighter. As will be discussed below, the color and boldness of the tips of greater and median covert feathers are important field characters. However, first-fall birds that have replaced few to none of the median and greater coverts may exhibit substantial wear, potentially reducing the overall size and boldness of the wingbars. In contrast, fall adults after complete prebasic molt should be in fresh plumage.

NOTES ON FIELD IDENTIFICATION IN BASIC PLUMAGE

The key features on which one should focus on when attempting an identification of an American Pipit or Siberian Pipit in basic plumage are: the color and contrast of the median coverts; the size, color, and shape of the submalar stripe; the color of the underparts; the degree and size of streaking; the boldness of the eye-ring; and the color of the legs. These features are chiefly of use for birds in fresh basic plumage, which in American Pipit is held between late August and late December or so. The field marks discussed below (and generalized graphically on the front cover and accompanying the subspecies accounts below) are valid between late August and late January. Between late January and late March, when birds are undergoing prealternate molt, there is something of a gray zone, in which intermediate characters will be apparent. Since the first prebasic molt occurs on the breeding grounds, juvenal plumages are not likely to be encountered on wintering grounds or during migration and are therefore not discussed here.

Siberian Pipit (*A. r. japonicus*) versus American Pipit

Size and overall coloration—Siberian Pipit is by far the most distinctive subspecies of the Buff-bellied Pipit complex (Figs. 4-10). Overall, it appears larger and bulkier than *pacificus* and *alticola*, and in side-by-side

by comparisons, its larger size relative to *pacificus* and *alticola* may be noticeable. Siberian overlaps in size with *rubescens*. Siberian differs from American in having dark olive-brown upperparts, appearing darker and browner than the upperparts of American. The underparts of Siberian are generally whiter than those of the American. The sides and chest of Siberian may occasionally be washed with buff, but typically the throat, center of breast, and belly are white, whereas these same regions on *rubescens*, *alticola*, and *pacificus* are generally buffy or off-white (although *pacificus* can be variably whitish below). Compared to the characteristically buffy *rubescens* and *alticola*, Siberian Pipit appears very white below. The most significant overlap in overall coloration is with *pacificus*, which tends to be slightly grayer than *rubescens* and *alticola*. However, in most cases, the underparts of *pacificus* are buffy or gray rather than white.

Underpart streaking—Siberian Pipit is distinctly marked below with long and thick streaks, which are dark brown in color (sometimes appearing black). The streaks on Siberian extend noticeably down the flanks, more so than on American. The underpart streaking on Siberian is reminiscent of Meadow (*A. pratensis*), Olive-backed (*A. hodgsoni*), and Red-throated Pipits (*A. cervinus*). The dark coloration of the streaks contrasts strongly with the white underparts and is also considerably darker than the gray-brown upperparts. Underpart streaking in American is browner and lighter in coloration: in part, too, because of their buffier underparts, the contrast between the streaks and underparts is subdued. A subtle but potentially distinctive feature of the streaks on Siberian is that the streaks tend to coalesce longitudinally, often lending the underparts a "striped" appearance. This feature is likely to be most useful in distinguishing the Siberian from *pacificus* because the streaks on *pacificus* tend to be short and often do not coalesce significantly, giving *pacificus* a somewhat spotted rather than a streaked or striped appearance (Figs. 3, 11, 13). *Rubescens* and *alticola* may show a slightly striped appearance, but the degree of coalescence between streaks is smaller than that on Siberian.

Median wing coverts—The median coverts of Siberian Pipit nearly always have white tips, whereas those of American are characteristically buffy, especially in *rubescens*. Moreover, due to Siberian's grayer and dark-



er upperparts and wings, the white-edged median coverts stand out as white upper wingbars. Even for those Siberian Pipits that are slightly buffy below, we found that the entire upper wingbar appears white. The greater coverts (lower wingbars) on Siberian vary between whitish and buffy and are therefore not diagnostic. On American, the color of the median and greater covert edges is buffy in both cases. We believe that the color of the upper wingbar and the degree of contrast with the wings may be potentially diagnostic in the field for Siberian, but further studies in the field and of museum specimens are needed. It is possible that first-winter birds have whiter median and greater covert tips than do adults.

Eye-ring—Both Siberian and American Pipits exhibit a white eye-ring. While the thickness or completeness of the eye-ring is quite variable in most subspecies, the eye-ring tends to stand out more on Siberian because of its overall darker upperparts.

Submalar stripe—The submalar stripe on Siberian tends to be thick and dark, strongly contrasting with the white underparts and the brown upperparts. The contrast between the submalar stripe and the upperparts in American is generally not as strong, because the submalar stripe on American is concolorous with upperpart coloration, whereas the submalar stripe on Siberian is usually distinctly darker than the upperparts.

In addition, the posterior end of the submalar stripe on Siberian tends to be more solidly colored than on American. In American, the individual streaks making up the submalar stripe can often be seen, this effect being more pronounced on *pacificus* than on *rubescens* or *alticola*. Another helpful feature is that Siberian's submalar stripe bulges at its lower end, often flaring into the side of the neck, reminiscent of Richard's Pipit (*A. richardi*) and to a lesser extent Red-throated Pipit. While American Pipit can also display this feature, the degree of flaring is generally less, and in many cases, the lower end of the submalar stripe does not extend beyond the auriculars. The dark submalar stripe of Red-throated may superficially resemble Siberian when seen head-on, so presumed Red-throated Pipits in North America should be carefully scrutinized.

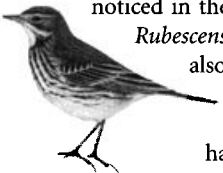
Leg coloration—Siberian Pipit has pink or pale brown legs but never black legs. In general, American has brownish, grayish, or black legs. In this respect, Siberian Pipit more closely resembles Red-throated Pipit than American Pipit. However, we have observed *pacificus* and *rubescens* with pale brown legs. In fact, to see several pale-legged basic-plumaged *pacificus* individuals in a small flock is not unusual (cf. Fig. 13). Thus, while pale legs may signify a potential Siberian, the amount of leg-color variation in American makes it unwise to use leg color as a basis for identification.

American Pipit: subspecific variation

A continuum of variation probably occurs in this species, and thus field identification of American Pipit to the subspecies level may not be possible. Our reasons for addressing this issue are not to encourage subspecific identification but to convey the degree of subspecific variation, thereby refining the ability to separate Siberian from American Pipits of all forms.

The nominate subspecies, *rubescens*, tends to be the buffiest and largest of the three subspecies (Fig. 12). The size difference is very subtle, but differences with *pacificus*, the smallest of the subspecies, might be noticed in the field during direct comparison on level ground.

Rubescens tends to have buffier wingbars than *pacificus* and also tends to have an overall browner plumage than *pacificus*. Streaking on the underparts tends to be slightly more extensive than in *pacificus*, which has a more spotted appearance. *Rubescens* may also



have a slightly bolder submalar stripe than *pacificus* (but not as bold as in Siberian). In addition, the streaks on *rubescens* tend to coalesce laterally in the upper chest region, sometimes forming a continuous band on the chest. In *pacificus*, the streaks do not coalesce as much, giving the breast a more spotted appearance.

Pacificus is the smallest and grayest of the three American subspecies (Fig. 13). The streaks on its underparts tend to be small and short and do not coalesce together laterally or longitudinally. This gives it a spotted rather than streaked or striped appearance.

Median and greater covert tips range from gray to buff but typically not as buff as in *rubescens*. Underpart coloration ranges from gray to buff. Although not typically as buffy as *rubescens*, this subtle difference in the degree of buffiness seemed noticeable only in side-by-side comparison of museum specimens, where lighting conditions on all specimens can be made identical. This feature is unlikely to be reliable in the field or in photographs.

Alticola is intermediate in size between *rubescens* and *pacificus*. Its plumage more closely resembles that of *rubescens* because it generally has a buffier overall coloration, darker underpart streaking than *pacificus*, and buffy edges to the median and greater wing coverts. Like *rubescens*, the streaks on the upper chest appear to coalesce laterally, often forming a continuous band across the upper chest.

We stress that these features of *alticola* are based solely on comparison of museum specimens. Identification to subspecies was based primarily on range. We assumed that those specimens (n=6) collected in Texas during the winter that appeared buffier than typical *pacificus* were *alticola*. As such, we consider our notes on basic-plumaged *alticola* to be preliminary—and potentially in error. Further research is necessary to characterize *alticola* in basic plumage.

Conclusions

Field identification of birds in the Buff-Bellied Pipit complex is difficult. Siberian Pipit can generally be separated in the field from the American subspecies using a combination of field marks, particularly aspects of the wingbar's color, the overall color of plumage, the degree of streaking ventrally, the thickness of the submalar stripe, the boldness of the eye-ring, and the leg color, whereas the field identification of the American complex to the subspecies level needs further study, but we hope that this preliminary outline of subspecific plumage variation in American Pipits brings us a step closer to this goal.

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Literature cited

- Alstrom, P., and K. Mild. 1987. Some notes on the taxonomy of the Water Pipit complex. *Proceedings of the Fourth International Identification Meeting*: 47-48. Eilat, Israel.
- . 1996. The identification of Rock, Water and Buff-bellied Pipits. *Alula* 4: 161-175.
- American Ornithologists' Union. [A. O. U.] 1957. *Check-list of North American birds*. Fifth ed. American Ornithologists' Union, Baltimore, Maryland.
- . 1983. *Check-list of North American birds*. Sixth ed. American Ornithologists' Union, Washington, D. C.
- . 1989. Thirty-seventh supplement to the American Ornithologists' Union's *Check-list of North American Birds*. *Auk* 106: 532-538.
- . 1998. *Check-list of North American birds*. Seventh ed. American Ornithologists' Union, Washington, D. C.
- Bannerman, D. A. 1953. *The birds of the British Isles*. Vol. 2. Edinburgh.
- Beaman, M., and S. Madge. 1998. *The handbook of bird identification for Europe and the western Palearctic*. Princeton University Press, Princeton, New Jersey.
- Braun, C.E. 1980. Alpine bird communities of western North America: implications for management and research. In: *Workshop proceedings of the management of western forests and grasslands for nongame birds*. U S Forest Service General Technical Rep. INT No. 86: 280-291.
- Brazil, M. A. 1991. *The birds of Japan*. Smithsonian Institution Press, Washington, D. C.
- British Ornithologists' Union [B. O. U.] Records Committee. 1986. Twelfth report. *Ibis* 128: 601-603.
- Bull, J. L. 1974. *Birds of New York state*. Cornell University Press, Ithaca, New York.
- Campbell, R. W., N. K. Dawes, I. McTaggart-Cowan, J. M. Cooper, G. W. Kaiser, M. C. E. McNall, and G. E. J. Smith. 1997. *The birds of British Columbia*. Vol. 3. University of British Columbia Press, Victoria, British Columbia.
- Chang, J. W.-F. 1985. *A field guide to the birds of Taiwan*. Tunghai University Press, Taiwan.
- Conry, J. A. 1978. Resource utilization, breeding biology and nestling development in an alpine tundra passerine community. Ph.D. dissertation. University of Colorado, Boulder.
- Cramp, S., ed. 1988. *Handbook of the birds of Europe, the Middle East and North Africa: The birds of the western Palearctic*. Vol. 5. Oxford University Press, London.
- Dement'ev, G. P., and N. A. Gladkov. 1970. *Birds of the Soviet Union*. Vol. 5. Trans. by the Israel Program for Scientific Translations, Jerusalem, Israel, for the Smithsonian Institute and the National Science Foundation, Washington, D.C.
- Devillers, P. 1980. Projet de nomenclature Française des Oiseaux du Monde. *Le Gerfaut* 70: 121-146.
- Erickson, R. A., S. F. Bailey, and D. G. Yee. 1990. The fall migration: Middle Pacific Coast region. *American Birds* 44: 155-160.
- Evans, L. G. R. 1994. *Rare birds in Britain 1800-1990*. LGRE Publications, Ltd.
- Miller, A. H., H. Friedmann, L. Griscom, and R. T. Moore. 1957. *Distributional check-list of the birds of Mexico*. Part II, Pacific Coast Avifauna, Number 33, Cooper Ornithological Society.
- Gabrielson, I. N., and F. C. Lincoln. 1959. *The birds of Alaska*. Stackpole, Harrisburg, Pennsylvania.
- Garrett, K. L., and J. L. Dunn. 1981. *Birds of southern California: status and distribution*. Los Angeles Audubon Society.
- Glutz von Blotzheim, U. N. (ed.). 1985. *Handbuch der Vögel Mitteleuropas*. Vols. 10/11. Wiesbaden.
- Gore, M. E. J., and P. O. Won. 1971. *The birds of Korea*. Royal Asiatic Society, Seoul, Korea.
- Grimmett, R., C. Inskipp, and T. Inskipp. 1999. *Birds of India, Pakistan, Nepal, Bangladesh, Bhutan, Sri Lanka, and the Maldives*. Princeton University Press, Princeton, New Jersey.
- Grinnell, J., and A. H. Miller. 1944. *The distribution of the birds of California*. Cooper Ornithological Club, Berkeley, California.
- Hall, B. P. 1961. The taxonomy and identification of pipits (genus *Anthus*). *Bulletin of British Museum of Natural History* 7: 243-289.
- Howell, S. N. G., and S. Webb. 1992. Noteworthy bird observations from Baja California, Mexico. *Western Birds* 23: 153-163.
- . 1995. *A guide to the birds of Mexico and northern Central America*. Oxford University Press, New York.
- Imhof, T. A. 1962. *Alabama birds*. University of Alabama Press, Tuscaloosa, Alabama.
- Inskipp, C., and T. Inskipp. 1985. *A guide to the birds of Nepal*. Smithsonian Institution Press, Washington, D. C.
- James, D. A. 1986. *Arkansas birds*. University of Arkansas Press, Fayetteville, Arkansas.
- Jenni, L., and R. Winkler. 1994. *Moult and ageing of European passerines*. Academic, London.
- Jones, H. L. 2002a. The winter season: Central American region. *North American Birds* 56: 232-234.
- . 2002b. The spring migration: Central American region. *North American Birds* 56: 369-371.
- Kale, H. W., and D. S. Maehr. 1990. *Florida's birds*. Pineapple Press, Sarasota, Florida.
- King, B. 1981. The field identification of North American Pipit. *American Birds* 35: 778-788.
- King, B. F., and Dickenson, E. C. 1975. *A field guide to the birds of south-east Asia*. Collins, London.
- Knox, A. 1988. Taxonomy of the Rock/Water Pipit superspecies *Anthus petrosus*, *spinoletta* and *rubescens*. *British Birds* 81: 206-211.
- Levine, E., ed. 1998. *Bull's Birds of New York State*. Cornell University Press, Ithaca, New York.
- Lewington, I., P. Alström, and P. Colston. 1991. *A field guide to the rare birds of Britain and Europe*. Domino Books, Jersey, England.
- Lowery, G. H., Jr. 1955. *Louisiana birds*. Louisiana State University, Baton Rouge, Louisiana.
- McCaskie, G. 1978. The nesting season: Southern Pacific Coast region. *American Birds* 32: 1206-1211.
- . 1990. The fall migration: Southern Pacific Coast region. *American Birds* 44: 158.
- . 1992. The fall migration: Southern Pacific Coast region. *American Birds* 46: 142-153.
- McCaskie, G., and K. L. Garrett. 2002. The fall migration: Southern Pacific Coast region. *North American Birds* 56: 105-109.
- Miller, J. H. 1988. Breeding ecology and nestling development of Rosy Finches and Water Pipits in the Sierra Nevada, California Environmental Field Program, University of California at Santa Cruz Special Paper 5.
- Miller, J. H. and Green, M. T. 1987. Distribution, status and origin of Water Pipits breeding in California. *Condor* 89: 788-797.
- Monson, G., and A. R. Phillips. 1981. *Annotated checklist of the birds of Arizona*. University of Arizona Press, Tucson, Arizona.
- Nazarenko, A. A. 1978. On species validity of *Anthus rubescens* Tunstall (Aves, Motacillidae). *Zool. Zh.* 57: 1743-1745.
- Oberholser, H. C. 1974. *The bird life of Texas*. University of Texas Press, Austin, Texas.

- Oreel, G. J. 1980. Dutch Birding Association Checklist. *Dutch Birding* 2: 82-104.
- Parkes, K.C. 1982. Further comments on the field identification of North American pipits. *American Birds* 36: 20-22.
- Petersen, W.R. 1991. The nesting season: New England region. *American Birds* 45: 1092-1096.
- Phillips, A. R. 1991. *The known birds of North and Middle America: distributions and variation, migrations, changes, hybrids, etc.* Part 2: Bombycillidae, Sylviidae, to Sturnidae; Vireonidae. Allan R. Phillips, Denver, Colorado.
- Pratt, H. D., P. L. Bruner, and D. G. Berrett. 1987. *The birds of Hawaii and the tropical Pacific*. Princeton University Press, Princeton, New Jersey.
- Pulch, W. M. 1988. *The birds of north-central Texas*. Texas A & M University Press, College Station, Texas.
- Pyle, P. 1997a. Molt limits in North American passerines. *North American Bird-Bander* 22: 49-89.
- . 1997b. *Identification guide to North American birds*. Part 1. Slate Creek Press, Bolinas, California.
- Robbins, M. B., and D. A. Easterla. 1992. *Birds of Missouri, their distribution and abundance*. University of Missouri Press, Columbia, Missouri.
- Robinson, J. C. 1990. *An annotated checklist of the birds of Tennessee*. The University of Tennessee Press, Knoxville, Tennessee.
- Roberson, D. 1980. *Rare birds of the West Coast*. Woodcock Publications, Pacific Grove, California.
- Root, T. 1988. *Atlas of wintering North American birds*. University of Chicago Press, London.
- 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, Arizona.
- Russell, S. M., and G. Monson. 1998. *The birds of Sonora*. University of Arizona Press, Tucson, Arizona.
- Sadler, T. S., and M. T. Myres. 1976. Alberta birds, 1961-1970, with particular reference to migration. Provincial Museum of Alberta Natural History Occasional Paper No. 1.
- Shirihai H., and P. R. Colston. 1987. Siberian Water Pipits in Israel. *Dutch Birding* 9: 8-12.
- Shirihai, H. 1996. *The birds of Israel*. Academic, London.
- Sibley, D. A. 1997. *The birds of Cape May*. New Jersey Audubon Society, Cape May, New Jersey.
- . 2000. *The Sibley guide to birds*. Knopf, New York.
- Small, A. 1994. *California birds: their status and distribution*. Ibis Publishing Company, Vista, California.
- Spears, J. M. 1985. *Birds of Ontario*. D. W. Friesen, Toronto.
- Stone, W. 1937. *Bird studies at Old Cape May*. Vol. 2. Delaware Valley Ornithological Club.
- Thompson, M. C., and R. L. Delong. 1969. Birds new to North America and the Pribilof Islands, Alaska. *Auk* 86: 747-749.
- Vaurie, C. 1959. *The birds of the Palearctic fauna. Passeriformes*. London.
- Veit, R. R., and W. R. Petersen. 1993. *Birds of Massachusetts*. Massachusetts Audubon Society.
- Williamson, K. 1965. Molt and its relation to taxonomy in Rock and Water Pipits. *British Birds* 58: 493-504.
- Yee, D. G., S. F. Bailey, and B. E. Deuel. 1992. The fall migration: Middle Pacific Coast region. *American Birds* 46: 142-147.
- Zink, R. M., S. Rowher, A. V. Andreev, and D. L. Dittmann. 1995. Trans-Beringia comparisons of mitochondrial DNA differentiation in birds. *Condor* 97: 639-649.



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