

# Field identification of smaller sandpipers within the genus *Calidris*

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Paintings and line drawings by Lars Jonsson

## INTRODUCTION

THE SMALL *Calidris* sandpipers, affectionately referred to as "peeps" in North America, and as "stints" in Britain, have provided notoriously thorny identification problems for many years. The first comprehensive efforts to elucidate the picture were two papers published in *British Birds* (Wallace 1974, 1979) in which the problem was approached from the British perspective of distinguishing vagrant Nearctic or eastern Palearctic species amongst groups of migrant Little Stunts (*Calidris minuta*). A second major contribution to the identification of species in this group (and to the identification of shorebirds in general) was the publication of *A Guide to the Ageing and Identification of Holarctic Waders* by Prater *et al.*, in 1977. The detailed descriptions of shorebird plumages and molt contained in that work are indispensable to the shorebird enthusiast and are also particularly useful for the correct identification of small calidridines in the hand. A new paper in *British Birds* (Grant 1984), has used the same paintings by Jonsson that appear here.

Our approach is to define and summarize those characters by which peep sandpipers may be distinguished from one another *in the field*. We have avoided detailed discussions of characters that would be of use in the hand, both to keep the text within a manageable length, and also because we lack extensive experience with live birds in the hand. For identification of specimens or of live birds in

the hand, we recommend that the reader refer to the species accounts of Prater *et al.* (1977) or Cramp and Simmons (1983). Our conclusions in this paper are based upon our own extensive field experience, which, between us, includes first-hand familiarity with all seven species. We also examined specimens in the American Museum of Natural History, Museum of Comparative Zoology, Los Angeles County Museum, San Diego Natural History Museum, Louisiana State University Museum of Zoology, British Museum (Natural History), and the Museum of Natural History in Stockholm, studied numerous photographs, and discussed many points with individuals, who, through their travels, had special familiarity with one or another plumage that we lacked.

Because most of our field experience has been in eastern North America (Veit) and western Europe (Jonsson), a biased perspective on the comparative appearance of each of these birds has been inevitable. Therefore, the identification points discussed in this paper tend to reflect comparisons with the common North American species. Such a bias, we have assumed, is largely shared by the readers of *American Birds*.

## SPECIES TREATMENT

WE COVER the identification of seven Holarctic species in the genus *Calidris* that are collectively characterized by their very small size. These include

three Nearctic species, the Semipalmated Sandpiper (*C. pusilla*), the Western Sandpiper (*C. mauri*) and the Least Sandpiper (*C. minutilla*), and four Palearctic species, the primarily western Little Stint (*C. minuta*), the eastern Rufous-necked Stint (*C. ruficollis*), the eastern Long-toed Stint (*C. subminuta*) and the widespread Temminck's Stint (*C. temminckii*). Four of these species, *pusilla*, *mauri*, *minuta* and *ruficollis*, breed on arctic tundra and are found during migration in flocks of up to thousands of individuals on extensive tidal flats. Two others, *minutilla* and *subminuta*, breed farther south, in marshy areas of the boreal and sub-arctic zones, and, during migration, are usually less gregarious and prefer grassy marshes and flooded fields for foraging. The seventh species, *temminckii*, is primarily an arctic and sub-arctic breeder but is rather solitary during migration, when it is most often found around freshwater pools and in grassy marshes.

Among shorebirds, the species within this group are probably the most difficult to identify. When in breeding plumage, the species-specific color patterns are rather obvious, and render identification straightforward. But at other seasons, these species are extremely similar to one another and usually require considerable previous experience, exceptional viewing conditions, and a healthy amount of patience to identify correctly. In the following sections, we identify those morphological features most critical to the proper identification of these species.

*Painted especially for American Birds by Lars Jonsson, the opposite page shows four small sandpipers in juvenal plumage. In the background, a juvenile Western Sandpiper (Calidris mauri) is flanked by two juvenile Semipalmated Sandpipers (C. pusilla). The juvenile Western has upper scapulars with a pronounced contrast between the tawny fringes and dark centers, as well as a pale face and "beady" eye; both of these characters are lacking in the juvenile Semipalmated Sandpipers. In the foreground is a juvenile Rufous-necked Stint (C. ruficollis), similar to the juvenile Western but with a shorter bill, no webbing between the toes, and with brighter, more cinnamon/rufous upperparts*

## TOPOGRAPHY (Figure 1)

**I**N OUR descriptions of plumages and molts, we follow the terminology of Humphrey and Parkes (1959), further discussed as it applies to shorebirds by Palmer (1967).

In discussions of peep identification, it is convenient to speak of certain groups of feathers that are similarly colored or patterned, but which are not ordinarily referred to under a collective term. For example, of the five rows of scapulars on peeps, the upper three rows are often colored differently from the lower two. Therefore, we speak of the "upper" and "lower" scapulars (Fig. 1). Some other instances of terminology peculiar to this text are as follows:

**Head:** The "lateral crownstripes" are pale, usually whitish, lines which parallel the supercilium about one-third of the

way up the crown. The "forecrown" refers to the feathering immediately above the base of the bill.

**Upperparts:** The "V" marks are whitish stripes on the back of some peeps that are derived from white fringes to the mantle feathers, scapulars, or both. Depending on how these feathers are lying, the "V" marks may appear sharp or diffuse. We refer to "mantle" or "scapular" "V" marks, depending on which feathers are involved.

**Underparts:** The "breast sides" include the feathering above the flanks, or just ahead of and above the bend of the wing.

**Wings:** On peeps, the middle and greater secondary coverts are frequently visible on a standing bird, and their coloration is frequently critical in the identification of some species. For convenience, we refer to these as simply "greater coverts" or "middle coverts." The "primary projec-

tion" is the distance between the tip of the longest primary and the tip of the longest tertial.

## SIZE

**A**LTHOUGH THE range in size between the largest species (Western Sandpiper) and the smallest (Least Sandpiper) is substantial, size differences between other species are small and usually difficult to judge. The sandpipers in this group are sexually dimorphic in size (females slightly larger), and the apparent size of an individual bird can vary according to the position of its feathers and to other species with which it is associated. Minor differences in the distance between birds, which to the observer are foreshortened by optical equipment, can result in a significant distortion in the apparent relative size of birds that seem to

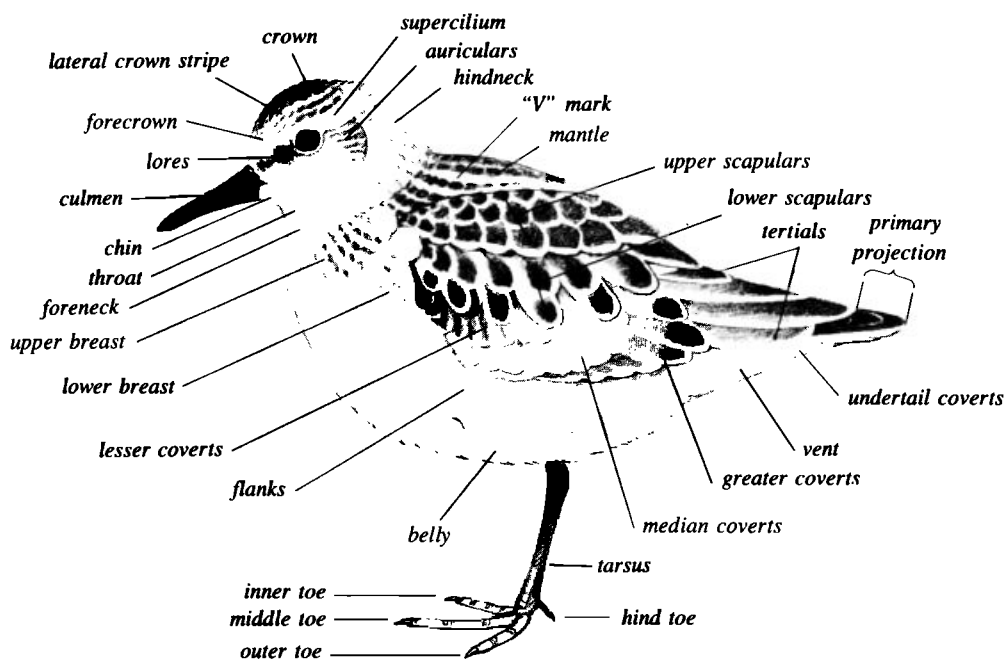


Figure 1. Topography of a *Calidris*.

be standing next to one another. Therefore the proportions, rather than the size *per se*, are more useful in determining the species.

## STRUCTURE AND POSTURE

**I**N MANY cases, identification of peeps depends upon structural characters of the bill, legs and feet (Fig. 2). Two North American species, *pusilla* and *mauri*, have partial webbing between the toes, which the similar Palearctic species, *minuta* and *ruficollis*, lack. This feature is surprisingly easy to see, once one is familiar with the difference in appearance between webbed and unwebbed feet (Fig. 3). North American observers can usefully study this distinction by comparing the feet of Least vs. Semipalmated/

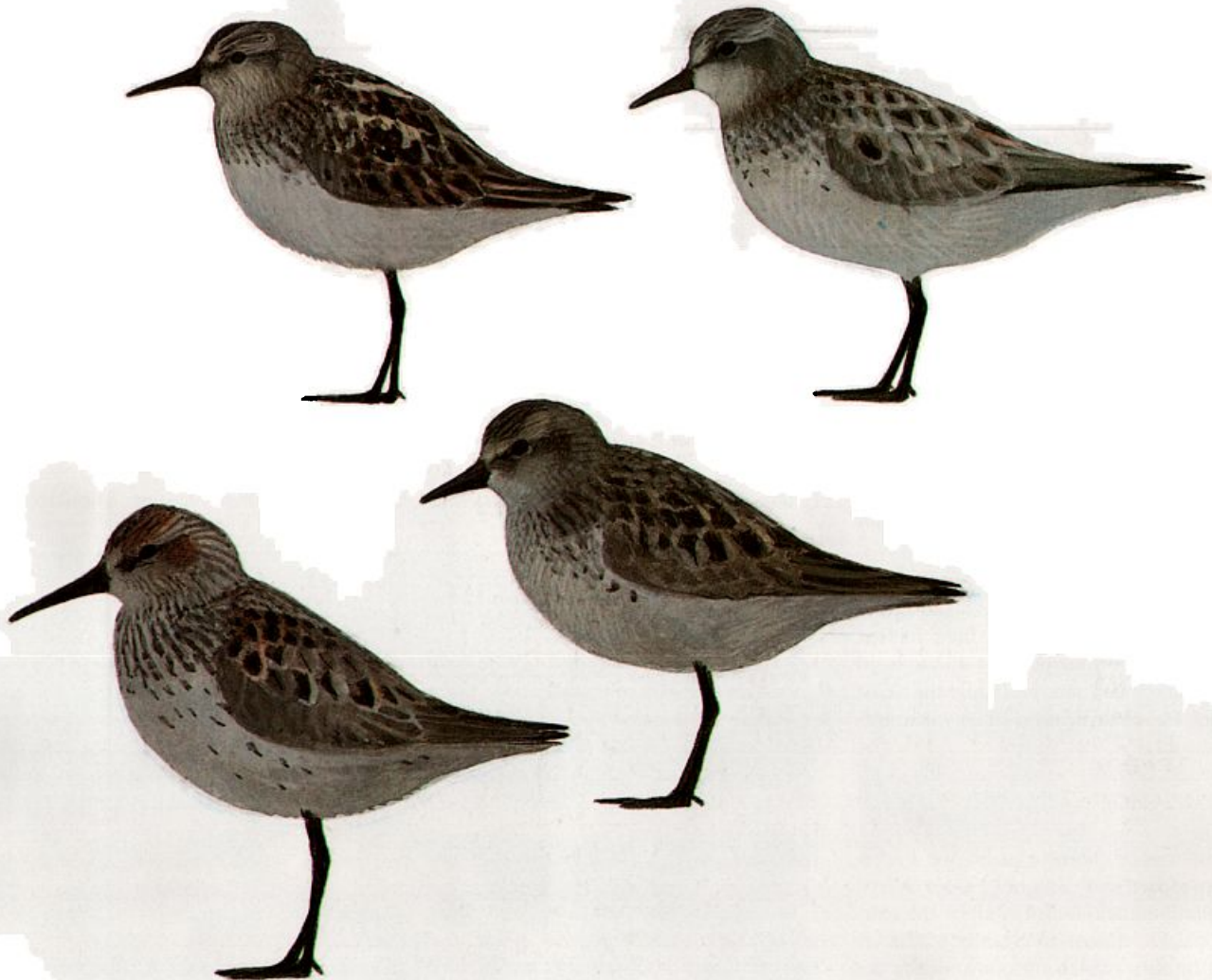
Western sandpipers. One should beware of birds that lack webbing but acquire a "club-footed" look as a result of mud caked to their toes.

The shape of the bill, while it varies with sex, age, and in some cases, geographical origin, is a species-specific character and is often the first clue to the presence of a rare species. Critical aspects include the overall length, the amount of curvature, and the degree of pointedness as observed both from above and from the side. Lateral expansion of the bill tip, resulting in a slightly spatulate condition, is typical of the Semipalmated Sandpiper but is only visible when the bird is viewed head-on. A blunt-tipped profile, only visible from the *side*, is characteristic of the Semipalmated Sandpiper and Rufous-necked Stint. The Least Sandpiper and the Long-toed and

Little stints, by comparison, have finely tipped bills.

The extent of the folded primary tips beyond the tip of the longest tertial seems to be of some use in the field, but variation in this feature has not been thoroughly investigated. The Least Sandpiper and Long-toed and Temminck's stints have very little, if any, primary projection. Of the black-legged species, Little and Rufous-necked stints usually have greater primary projection than Semipalmated and Western sandpipers. This character should probably be used only for juveniles in fall, as one cannot assume that the primaries are completely grown in birds of other ages.

The shape of the body and the stance typically assumed both lend a great deal to the appearance of a sandpiper and therefore provide useful clues to its iden-



**Figure 2.** Typical silhouettes of four black-legged peeps. Little Stint (top left) and Rufous-necked Stint (top right) in first alternate plumage; Western Sandpiper (bottom left) in drab alternate plumage; Semipalmated Sandpiper (bottom right) in typical alternate plumage.

tity. For example, the difference in crown profile is useful for separating Least Sandpipers from Long-toed Stints, and the horizontal posture of the Rufous-necked Stint differs from the more erect stance of the Little Stint. However, the posture of a particular bird will vary according to its behavior and to the weather. Alert or frightened birds stand erect with neck extended, while those that are resting or feeding in windy conditions tend to crouch and retract their necks (Fig. 4). A bird's posture will also affect the way the feathers lie; on a relaxed bird, the scapulars fluff out and conceal the wings (Fig. 4b) while a tense bird will flatten the scapulars and expose most of the wing (Fig. 4a).

### BEHAVIOR

**E**ACH SPECIES of *Calidris* behaves in a somewhat characteristic fashion, which may be helpful in its identification. For example, foraging Little Stints tend to pick at the surface more quickly or nervously than do Semipalmated Sandpipers. Least Sandpipers and Temminck's Stints tend to fly straight upwards on flushing, while most other species fly low and horizontally. Throughout our species accounts, we allude to behavioral aspects that have been ascribed to one or another species. Since most of the available information on this subject is anecdotal, we would advise discretion in using behavioral cues for identification. For example, at Newburyport Harbor, Massachusetts, Least Sandpipers feed in the fall almost exclusively in *Spartina* grass at the edge of the tidal flats, while in spring the same species feeds primarily at the seaward edge of the flats. Other conflicting descriptions of shorebird feeding behavior in the literature similarly suggest that their habitat choice is opportunistic. For this reason, behavioral cues are probably the least useful for identification of any features we discuss.

### COLORATION

**T**HE COLOR nomenclature we use is modified from Smithe (1975). One of the predominant colors in all of the calidridines is closest to Smithe's "cinnamon/rufous," which for convenience we shall refer to as "rufous." For other colors, we closely follow his terminology.

Feather and soft-part coloration is, of course, of vital importance in peep iden-

tification. The color, and *pattern* of coloration, on the mantle, scapulars, tertials and secondary coverts are especially pertinent in calidridine identification. When the distinctive patterns have mostly disappeared from individual birds during periods of molt, the retention of a few characteristically colored feathers may

reveal that bird's identity. For example, juvenile Western Sandpipers retain a few distinctive rufescent scapulars until the late fall and are therefore still identifiable by this character.

The head pattern varies in a predictable fashion between species and is usually useful for identification. The dark fore-

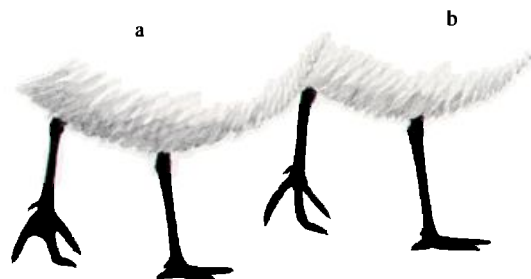


Figure 3. Comparison of webbed (a) and unwebbed (b) feet.

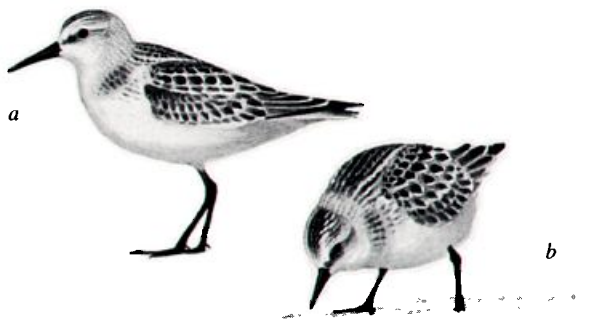


Figure 4. Variation in posture of juvenile Little Stint: a. alert, erect bird with scapulars flattened and wing exposed; b. crouching bird with neck retracted and plumage fluffed out to conceal wing.



Figure 5. Juvenile Semipalmated Sandpiper. New York, September. Photo/T. H. Davis.



Figure 6. Juvenile Semipalmated Sandpiper. New York, late August. Photo/P. A. Buckley.

crown of Long-toed Stints differs from that of Least Sandpipers, and the facial patterns of juvenile Semipalmated Sandpipers and Little Stints are more distinct than those of Western Sandpipers and Rufous-necked Stints.

The coloration of calidridines varies considerably between individuals. There is very little, if any, consistent sexual dimorphism with respect to color in these birds, so variation such as that in juvenile Semipalmated Sandpipers (Figs. 5, 6) is due to some other factor.

Leg coloration quickly separates these birds into two groups, the "yellow-legged" and the "black-legged" species. The "black-legged" species (*mauri*, *pusilla*, *minuta* and *ruficollis*) show variation in leg color, as those of juveniles range from dark olive to dark neutral gray. Yellow legs can look dark if covered with mud. Aberrations in soft-part colors have also been recorded, such as black legs on Temminck's Stints (Ruck 1977). The only significant variation in bill color among peeps is in the Long-toed Stint, which has a yellowish base to the lower mandible.

#### AGING, MOLT AND WEAR

**K**NOWING THE age or plumage of a bird is usually the first step towards reaching a correct identification. Each plumage has its own characteristic features that must be compared with the corresponding plumage of each other species.

In our abbreviated discussion of plumages and molts, we concentrate on those

feathers that contribute most significantly to the appearance of the bird. Thus, when we specify the timing of a particular molt, we refer to that time of year when the visible body feathers are replaced. The flight feathers of shorebirds, for example, are often molted later in the autumn than the body plumage. We discuss molt of wing feathers only in circumstances where comparative wear of the primaries is useful for determining a bird's age.

Molting is frequently affected by the migratory pattern of individual birds. Generally speaking, shorebirds do not molt flight feathers while migrating. Therefore, sandpipers that winter at localities far from their breeding grounds molt on a different schedule from those that winter closer by. For example, adult Least Sandpipers that winter in South America postpone molt until after they arrive on their wintering grounds (usually after September), whereas those wintering in California begin molting in July. Similar differences apply to most other species.

#### Aging

The juvenal, definitive basic, and definitive alternate plumages of calidridines are almost always identifiable in the field. Distinguishing first basic plumage from definitive basic is usually possible because first-year birds retain their juvenal wing coverts and sometimes, the juvenal tertials, which contrast with the newly grown basic features. Birds in first alternate plumage are often much duller

than those in definitive alternate plumage, because they grow basic-patterned feathers during the first pre-alternate molt. Others, however, are frequently indistinguishable from adults.

The sequence of calidridine plumages is as follows:

The *juvenal* plumage is the first set of contour feathers grown. Birds in juvenal plumage (= juveniles) are recognizable with practice because they are bright and neat looking. The upperparts have fine, pale fringes to the feathers that produce a scaly impression, and the upper breast is washed with buff in most species.

The *first basic* plumage includes a generation of *body* feathers grown during the first fall. First basic birds are often separable from adults because they retain the juvenal wing and tail feathers. In some species, the first pre-basic molt is *complete*, including remiges and rectrices.

The *first alternate* plumage, acquired by a partial molt involving the body feathering, takes place during the bird's first spring, but may continue through the summer. Ordinarily, the feathers grown at this stage are not as bright as those of the adults.

The *definitive basic* plumage is acquired in the first complete molt, the pre-basic molt, when the bird is just over one year old.

The *definitive alternate* plumage, which is acquired in a molt that involves mainly the body feathering, is then assumed each subsequent spring, and is the "breeding" or "nuptial" plumage.

#### Molt

Molt is a complex and variable process. In our above definitions, we describe the typical sequence for populations as a whole, and do not point out extremes of individual variation. As molt is largely governed by a bird's hormonal state, and is successfully completed only by healthy birds, individuals that occur far outside their normal range are probably somewhat more prone to peculiar molts. For example, some vagrant juvenile stints have been found to retain their juvenal feathering longer than usual.

There is evidence that the amount of color present in growing feathers is also under hormonal control (Voitkevich 1966). Thus, the coloration of alternate body feathering is governed by hormones that are highly concentrated just prior to the breeding season. In immature birds, hormonal levels may be much lower than

**Plate 1. Juvenal plumages.** a. Rufous-necked Stint, fresh plumage, August. b. Rufous-necked Stint, typical, August-September. c. Semipalmated Sandpiper, rather worn, September-October. d. Semipalmated Sandpiper, typical, August-September. e. Semipalmated Sandpiper, unusually rusty. f. Western Sandpiper, fresh, August. g. Western Sandpiper, typical, with a few basic feathers coming in among upper scapulars.



**Figure 7.** Variation in color of tertials of Rufous-necked Stint in alternate plumage. Numbers show sequence of molt. 1. Basic-like and strongly abraded. 2. Basic-like but slightly more strongly marked, showing change in hormonal balance; somewhat abraded. 3. Fresh feather showing maximum coloration.

in adults, so that growing feathers are not as brightly colored. Even in adults, some alternate feathers appear early in spring, and look more like those of the basic plumage (Fig. 7). Temminck's Stint shows this sort of "partial" alternate plumage most obviously among the peeps.

The amount of color and pattern in the first alternate plumage varies considerably. Most Little, Long-toed and Temminck's stints seem to accompany the adults to the breeding grounds and therefore acquire a plumage very similar to the adults. Semipalmated and Western sandpipers, however, usually spend their first summer on the wintering grounds and produce alternate feathering more similar to the basic plumage.

Among one-year-old Rufous-necked Stints, those that remain on the wintering grounds during the summer grow alternate feathers that are almost identical to the basic feathers, while those that migrate northwards attain a partial breeding condition, and therefore grow many al-

ternate-patterned feathers.

Differences in molt sequence are useful in identification. For example, in definitive alternate plumage, Little Stints have alternate-patterned, while Rufous-necked Stints have basic-patterned, wing coverts.

#### Wear

The appearance of shorebirds is continually modified by feather wear. This inevitable process has evolved to the bird's advantage in the case of alternate plumages. For example, Little Stints have fragile whitish tips to the feathers of the upperparts that wear off by the time the birds arrive on the breeding grounds, revealing the bright underlying colors. Feathers grown earliest in the pre-alternate molt have the widest fringes, so that the entire plumage is exposed by wear at the same time (Fig. 7).

Juveniles gradually lose the brightly colored species-specific fringes to their feathering during the course of the fall (cf. Figs. 5 and 8). Thus, late migrants of all species tend to resemble one another

more closely. Feather wear also tends to alter the appearance of the facial pattern

We have purposely avoided evaluating recent North American records of vagrant stints, and have only briefly summarized their occurrence. We would, however, be most interested to hear of future records of Palearctic species in North America, so that an eventual clarification of their status may be published

### SEMPALMATED SANDPIPER

*Calidris pusilla*

#### Distribution

The Semipalmated Sandpiper is one of the most numerous and familiar shorebirds of eastern North America. It occurs during migration in flocks of tens of thousands on tidal sand and mud flats. The species breeds in North America from western Alaska, extreme northern Keewatin and southern Baffin Island south to the southern shore of Hudson Bay and coastal Labrador. Harrington and Morrison (1979) have shown a clinal



**Figure 8.** Juvenile Semipalmated Sandpiper. Massachusetts, early September. Photo/R. R. Veit.



*Vaux's Terns 82-83*

**Plate 2. Juvenal plumages.** *a. Little Stint, pale bird; b. Little Stint, typical, August-September; c. Little Stint, fresh, July-August; d. Long-toed Stint, typical rather dark bird, August-September; e. Least Sandpiper, typical, August-September; f. Temminck's Stint, fresh, August. Head-on views of: g. Semipalmated; h. Western; i. Rufous-necked; j. Little; k. Least; l. Long-toed.*

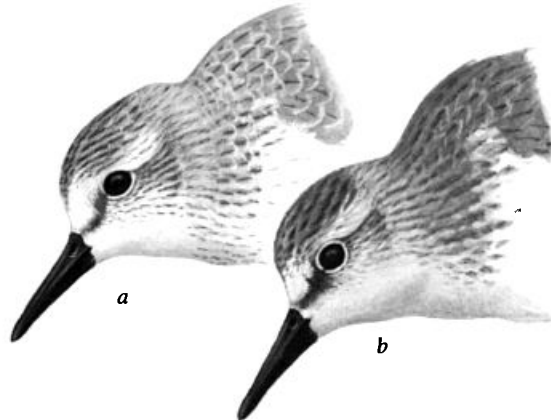
variation in bill length, which increases eastward across Canada. Females from the Ungava Peninsula area, therefore, overlap in bill length with small male Western Sandpipers (*C. mauri*). Semipalmated Sandpipers winter along both coasts of South and Central America from Mexico and Trinidad south to southern Brazil and southern Peru. On migration, most occur east of the Rocky Mountains. In spring, they are evenly distributed through the eastern United States in suitable habitat, but in fall most occur close to the Atlantic coast. Many passing through eastern Canada fly non-stop from the Bay of Fundy to the Caribbean and South America.

#### Structure

The Semipalmated Sandpiper is structurally most similar to the Western Sandpiper. Both species have blackish legs and partial webbing between the toes, heavy-set bodies, and a rather upright stance when at rest. The Semipalmated is typically more chunky, an effect that is enhanced by the stubby bill, which is straight and blunt-tipped, and also appears blob-ended when viewed head-on. Short-billed individuals have an almost conical bill, a characteristic not approached closely by any other peep. Other characters which differ between Semipalmated and Western sandpipers are discussed under the latter species.

#### Calls

The most characteristic call note of the Semipalmated Sandpiper is a low-pitched and somewhat coarse, rolling "chrrup." Another common call is a shorter and more abrupt "tchet" or "chip," similar to that of the Little Stint but lower-pitched. A trebled "chi-pi-lip" is also uttered by flushed birds; an extremely similar call is also uttered by flocks of Western Sandpipers.



**Figure 9.** Heads of Western (a) and Semipalmated (b) sandpipers in basic plumage.

#### Definitive Alternate Plumage (Plates 6a, b; 3c)

Acquired by a partial molt between February and April, this molt involves all of the body plumage, the inner greater and middle coverts, and two or three tertials. The upperparts of the alternate plumage consist of dusky brown feathers with smoke-gray edges, so that Semipalmated Sandpipers appear brownish gray when fresh (in spring) and warmer brown by the time they reach the breeding grounds. In this plumage, Semipalmated Sandpipers are most readily told from Westerns by the lack of bright cinnamon-/rufous tones on the scapulars, and by the reduced amount of heavy markings on the flanks. Some Semipalmateds attain an unusually bright rufescent cast to the upperparts, most intense on the sides of the crown, the auriculars, nape, and scapulars, and even occasionally extending to the upper breast and inner wing coverts. This rufescent coloration, however, is usually paler than the tawny or chestnut tones of Western Sandpipers, and is more uniformly distributed, not concentrated in discrete scapular, crown, and auricular patches as on Westerns, which always have grayish inner wing coverts. In May, many northbound

spring migrants have a few grayish scapulars and mantle feathers, which produce an irregular pattern on the upperparts (Plate 6b). Southbound migrants in July and August appear dusky brown on the upperparts until they acquire a few basic feathers (Plate 3c).

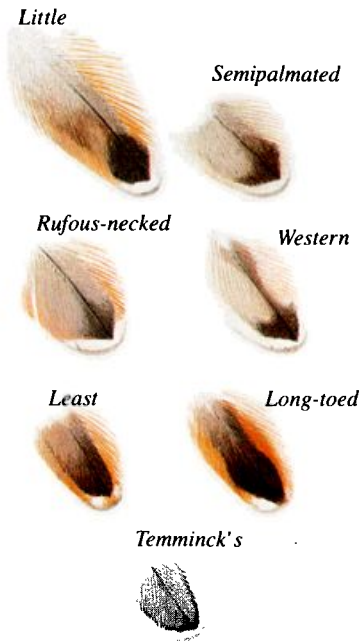
#### Definitive Basic Plumage (Plate 3d)

This plumage is acquired by a complete pre-basic molt between July and September. Most individuals begin to molt the body plumage while still in North America, but the remiges and rectrices are not ordinarily molted until the birds have arrived on their wintering grounds. The basic plumage of the Semipalmated Sandpiper is extremely similar to that of the Western Sandpiper, and, except for structural differences, these two species are most difficult to separate. In a direct comparison Semipalmateds appear warmer or browner on the upperparts, so that the dark shaft streaks are difficult to discern, and they usually lack crisp streaks on the breast sides. Other characters are illustrated in Figure 9 and discussed under the Western Sandpiper. These last details are of only average usefulness and are subject to modification through wear.





**Plate 3. Basic plumages.** *a. Rufous-necked Stint, adult in late stages of pre-basic molt; b. Rufous-necked Stint, typical adult; c. Semipalmated Sandpiper, adult in advanced pre-basic molt, August; d. Semipalmated Sandpiper, typical adult; e. Western Sandpiper, first basic plumage with retained juvenal wing coverts, breast pattern, and a few anteriormost scapulars; f. Western Sandpiper, typical adult.*



**Figure 10.** Lower scapulars of small *Calidris* species.

#### Juvenal Plumage (Plates 1c, d, e; 2g)

When fresh, juvenile Semipalmated Sandpipers have bright buff breast bands and appear uniformly grayish above with pale buff or whitish feather edgings throughout, together creating a "scaled" effect similar to that of juvenile Baird's Sandpipers (*Calidris bairdii*). Compared to most Westerns of the same age, this *uniformity* of coloration, and the neatly scaled appearance of the mantle and scapulars, are diagnostic. Some Semipalmateds have a bright rufescent cast to the upperparts (*e.g.*, Fig. 6), but the tone of the rufous is always paler, or less chestnut, than on Westerns, and also extends to the auriculars and crown. On Westerns, the darker chestnut coloration is restricted to the scapulars, mantle and tertials, so that a striking contrast is

apparent between the pale grayish head and the dark mantle and scapulars. Both species have white "V" marks along the scapulars in fresh plumage, although these are less obvious than on Little Stints, Least Sandpipers, or Long-toed Stints. Of the dark-legged peeps, the Semipalmated shows the most contrast in the face pattern. The crown, lores and auriculars are dark, especially when compared to most Western Sandpipers, which have pale faces and beady eyes. On fresh Semipalmateds, the dark feathering surrounding the eye accentuates the whitish eye ring, especially *above* the eye. This portion of the eye ring is ordinarily *invisible* on Westerns. As the juvenal plumage is abraded, the scaly effect on the upperparts disappears, but the contrast in the facial area increases.

A useful difference between juvenile Semipalmated Sandpipers and Little Stints is the pattern of the hindmost lower scapulars. Those of Little Stints show broad, dusky, oval patches, while those of Semipalmated Sandpipers are paler, so that the dark subterminal patch is reduced to an anchor-shaped mark (Fig. 10). The greater coverts and tertials are pale enough so that the dark shaft streak is ordinarily visible at close range, a pattern shared by Western Sandpipers and Rufous-necked Stints.

#### First Basic Plumage (Not illustrated)

Probably acquired between October and December, this plumage involves the body feathering, tertials and some coverts. In North America, juvenile Semipalmated Sandpipers very seldom show evidence of molt, and then not until early October at the earliest. Birds in first basic plumage are distinguishable from adults only if contrast between the retained juvenal coverts and fresh basic scapulars is apparent.

#### First Alternate Plumage (Not illustrated)

Some immature Semipalmated Sandpipers remain on their wintering grounds

in South America during their first summer (Phillips 1975). They undergo a partial molt of the body, tertials, coverts, and rectrices, and thus generally resemble basic adults, but grow a few alternate feathers. Some of these one-year-old birds appear in the United States during May and June. Some individuals from eastern Canadian populations, however, breed in their first summer and acquire a full alternate plumage (J.P. Myers *pers comm.*).

### WESTERN SANDPIPER

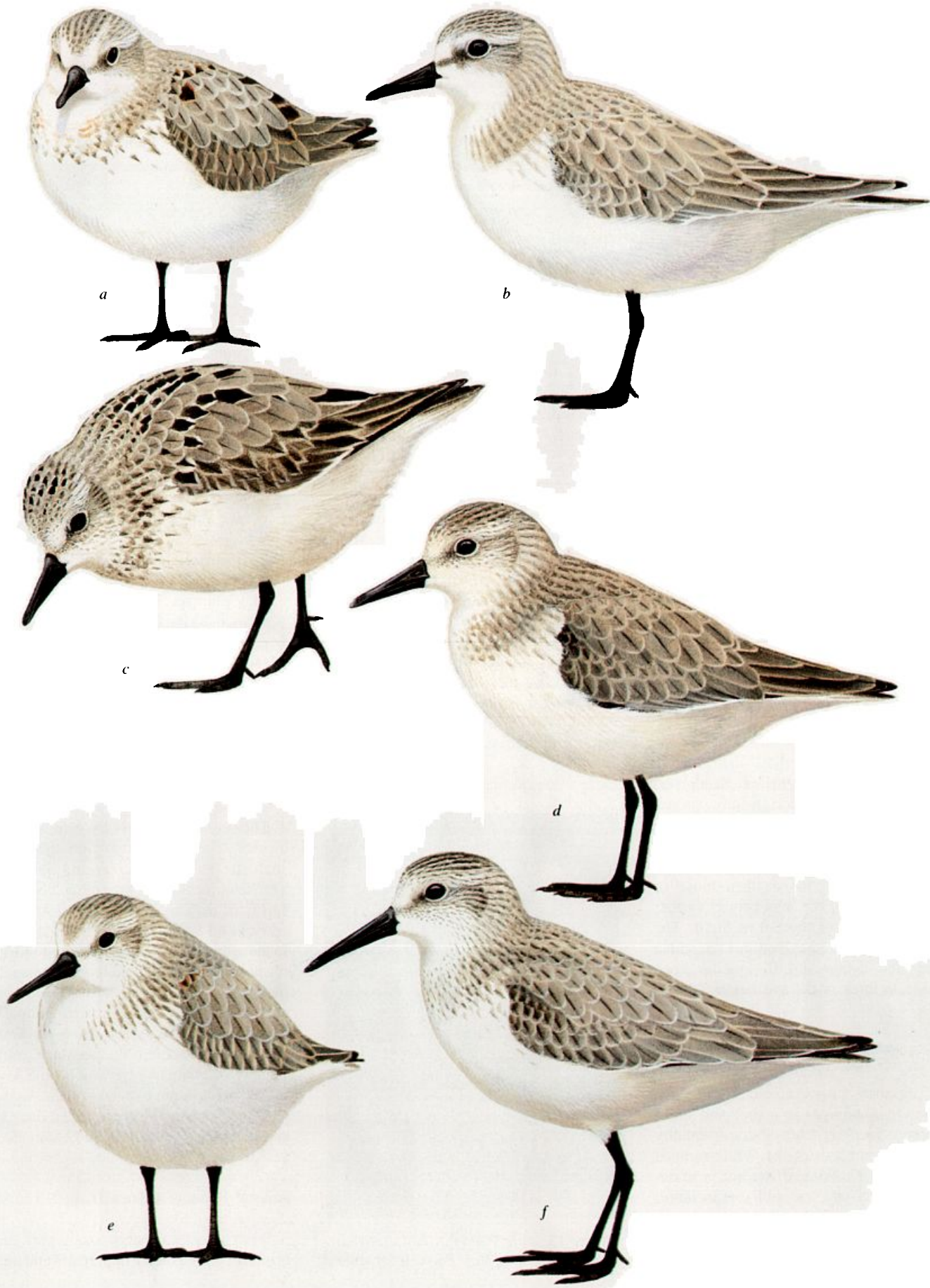
*Calidris mauri*

#### Distribution

Western Sandpipers seem to be the western ecological counterpart of Semipalmated Sandpipers. They breed in northeastern Siberia (Chukotskiy Peninsula) and in northern and western Alaska, and winter in the southern United States north to California and North Carolina, and south to southern Peru and Suriname. Most migrate along the Pacific coast, but some occur east to the Atlantic coast be-



**Figure 11.** Western Sandpiper molting from juvenal to first basic plumage. New York, late September. Photo/T. H. Davis.



**Plate 4. Basic and juvenal plumages.** *a. Little Stint, first basic plumage with retained juvenal wing coverts and tertials; b. Little Stint, adult basic plumage, without dark centers to feathers of upperparts and with complete breast band; c. Long-toed Stint, typical adult basic plumage; d. Long-toed Stint, juvenile in work plumage, October; e. Least Sandpiper, fresh basic plumage, with a few retained wing coverts, September; f. Least Sandpiper, first basic plumage with worn upperparts and retained juvenal wing coverts and tertials; g. Temminck's Stint, adult basic plumage with a few retained lesser wing coverts, August-September.*

tween New England and Florida, especially in the fall. During migration and winter, Western Sandpipers frequent extensive tidal flats. When Western and Semipalmated sandpipers occur together, the Westerns frequently feed farther offshore in slightly deeper water than the Semipalmateds, as one might reasonably predict based upon their longer bills and tarsi. Westerns differ most consistently from Semipalmateds, and from all other peeps, in their exceptionally longer bill, which is noticeably drooped at the tip and is also gradually attenuated to a fine point when viewed in profile. Particularly on the East Coast of North America, where female Semipalmateds tend to have especially long and even slightly drooped bills, one must rely more upon plumage characters and voice to separate these two species.

#### Structure

The body shape and stance of the Western Sandpiper is subtly distinct from that of the Semipalmated Sandpiper. Westerns have proportionately shorter wings than Semipalmateds, and this, in combination with the long bill, yields a bow-heavy carriage. As the tarsi of Westerns are slightly longer than those of Semipalmateds, the legs project farther beyond the tip of the tail in flight. The overall effect is rather Dunlin-like, with a long and decurved bill, angular head shape, a thick neck, and heavy "shoulders."

#### Calls

The most characteristic call of the Western Sandpiper is a thin and high-pitched "jeet" or "cheep" that in quality resembles the call of the White-rumped Sandpiper (*C. fuscicollis*), but is somewhat shorter and less sibilant. In large, single-species flocks, however, Westerns frequently give calls which to our ears are practically inseparable from the

flock calls of Semipalmated Sandpipers, but which are slightly higher-pitched.

#### Definitive Alternate Plumage (Plate 5f, g)

This plumage is acquired by partial molt, involving the body feathers, tertials and a few greater coverts, during the period February to April. This molt usually occurs somewhat earlier (sometimes in January) in Western than in Semipalmated sandpipers.

In fresh plumage, Westerns are easily told from Semipalmateds by the bright tawny patches in the scapulars, auriculars, and sides of crown, and by the bold pattern of triangular spots that extend across the breast and down the flanks, sometimes as far as the undertail coverts. The tawny scapulars contrast strongly with the cold gray wing coverts, and also with the grayish nape and interscapular region. Westerns never show buff on the sides of the breast. A few tawny scapu-

lars, auriculars, and crown feathers appear early in the pre-alternate molt, rendering partially molted Westerns quickly distinguishable from Semipalmateds. The lower scapulars are particularly long and pointed, and frequently reveal a bright tawny central patch, which is retained even in heavily abraded birds in July and August. Some of the anterior-most scapulars are among the last feathers to be replaced during the pre-basic molt, so that some fall Westerns appear completely gray, with a single rufous fleck just above the bend of the wing.

#### Definitive Basic Plumage (Plate 3f)

This plumage is acquired by a complete molt during the period July to October (those wintering in the U. S. and Mexico) or September to December (those wintering in South America). During the winter, Western Sandpipers are best told from Semipalmateds by bill structure and voice. When direct comparison is possible, fresh-plumaged Westerns can be told from Semipalmateds by the following characters (Fig. 9)

1. The entire upperparts of Westerns are a cleaner, colder gray, so that the dark shaft streaks appear darker and finer.
2. The head, neck, and breast are liberally sprinkled with fine blackish shaft streaks, whereas on Semipalmateds the markings in those areas are more blurred and indistinct. While in complete basic plumage, most Westerns have a necklace of streaks, normally lacking in Semipalmateds. However, Westerns in their first winter do not acquire the necklace until January or February, by which time Semipalmateds begin to acquire their "nuptial" necklace.
3. Westerns tend to lack a conspicuous eye ring because of the paleness of the entire face.

#### Juvenal Plumage (Plates 1f, g; 2h)

Fresh juvenile Western Sandpipers are brightly colored on the upperparts and are



Figure 12. Little Stint in definitive alternate plumage. Sweden, May. Photo/M. Marend.



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**Plate 5. Adult alternate plumages.** a. *Little Stint*, fresh, May-June; b. *Little Stint*, somewhat worn, July; c. *Little Stint*, worn, with incoming basic feathers on head, mantle, and scapulars, August; d. *Rufous-necked Stint*, full alternate plumage, June-July; e. *Rufous-necked Stint*, less colorful bird in fresh plumage, May; f. *Western Sandpiper*, typical alternate plumage, June; g. *Western Sandpiper*, very worn, starting to molt on mantle and scapulars, late July-August.



**Figure 13.** Juvenile Little Stints. Sweden, late September. Photo/U. Olsson.

much brighter, on average, than juvenile Semipalmated Sandpipers. Schematically, the pattern of the upperparts resembles that of juvenile Rufous-necked Stints, although the rufescent tones on Westerns are darker, or tawny, rather than cinnamon/rufous. In young Westerns there is a pronounced contrast between the upper scapulars, which have blackish centers and tawny fringes, and the lower scapulars and middle and greater coverts, which are all neutral gray with dark central streaks and pale buff or whitish edges. This contrast is always lacking in Semipalmated Sandpipers. Compared with Semipalmateds, the face of Western Sandpipers appears pale or washed out, and if any rufous is present on the crown, it is much paler than the tawny scapulars (*cf.* Semipalmated). The eye appears beady because it is not surrounded by the dark lores and auriculars as in the Semipalmated Sandpiper. The upper half of the eye ring, frequently apparent on Semipalmateds, is usually invisible on Westerns.

The first pre-basic molt of Western Sandpipers, unlike that of Semipalmat-

eds, begins during migration in the United States. The first feathers replaced are those of the crown, mantle, and some of the lower scapulars. The onset of molt thus accentuates both the general paleness of Western Sandpipers, and the contrast between the retained tawny scapulars and the grayish wings. Like adults, juvenile Westerns retain the anteriormost juvenal scapulars longer than the rest of the upperparts, which accounts for the tendency of field-guide artists to depict "winter" Westerns with tawny scapulars. The hindmost lower scapulars of juvenile Westerns have anchor-shaped subterminal marks that are even more prominent than those in Semipalmateds (Fig. 10). Both the scapulars and the tertials of Westerns have more pointed tips than those of Semipalmateds. Very fresh Westerns show bright white scapular and mantle "V" marks, although these are never as bright as those on Little Stints.

#### *First Basic Plumage* (Plate 3e)

Because the first pre-basic molt of Western Sandpipers is often complete by

mid- to late September, individuals resembling the ones depicted in Plate 3e and Figure 11 are not uncommon among mixed flocks of peeps in the United States in fall. Most of the juvenal wing coverts, and sometimes the juvenal breast pattern, are retained until February. Thus, young are usually distinguishable from adults during the winter.

#### *First Alternate Plumage* (Not illustrated)

Like Semipalmated Sandpipers, some Western Sandpipers acquire a partial alternate plumage during their first summer, while others acquire feathers that closely resemble those of the basic plumage. This difference is apparently related to summering locality: those that remain within the southern portion of the winter range most closely resemble basic adults throughout the summer, while those that migrate north acquire varying numbers of alternate feathers. Birds appearing to be in basic plumage, probably one-year-olds, frequently occur in the southern United States during spring.

### LITTLE STINT

*Calidris minuta*

#### *Distribution*

Little Stints breed on high arctic tundra from extreme northern Scandinavia and Novaya Zemlya east along the Siberian coast to about 145° east longitude. They winter mainly around the Mediterranean Basin, in Africa, and from Saudi Arabia east to India. In spring, most migrants pass northward to the east of western Europe. In fall, there is a displacement of juveniles to the west, so that flocks of up to 300 occur in Scandinavia and western Europe. Little Stints have occurred as vagrants on both coasts of North America, and also once in the interior. During migration and winter, their behavior and habitat preferences in general resemble those of Semipalmated and Western sandpipers. They are most numerous on



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**Plate 6. Adult alternate plumages.** *a. Semipalmated Sandpiper, full alternate plumage, June; b. Semipalmated Sandpiper, bird with retained basic feathers on upperparts, April; c. Least Sandpiper, full alternate plumage, June; d. Least Sandpiper, bird more worn and less colorful than c, July; e. Long-toed Stint, full alternate plumage, May-June; f. Temminck's Stint, worn and less colorful than g; g. Temminck's Stint, typical alternate plumage, June.*

extensive tidal flats, where they forage energetically, rapidly picking food items from the surface.

### Structure

Little Stints have blackish legs and *lack webbing* between the toes (Fig. 3). They are more delicately built than Semipalmated Sandpipers, with slender and very finely pointed bills and lengthier primary projection beyond the folded tertials. The bill may occasionally appear to have a blunt tip, but is never as deep at the base as that of Semipalmated Sandpipers, and usually appears thinner and more finely pointed than the bill of the Rufous-necked Stint. Compared with Rufous-necked Stints, Little Stints have a somewhat less steep forehead, a less elongated body, a more erect stance and longer tarsi. Thus, the stance of Rufous-necked Stints, when compared with Littles, tends towards the elongated impression seen in White-rumped Sandpipers.

### Calls

The usual flight call of the Little Stint is a sharp, high-pitched "tit," rather resembling the call notes of either Red-necked Phalaropes (*Phalaropus lobatus*) or Sanderlings (*Calidris alba*). Generally speaking, the call note of the Little Stint does not seem to vary outside of the breeding season, but in our experience, a jingling "tilililili" is occasionally uttered.

### Definitive Alternate Plumage (Plate 5a, b; Figure 12)

This plumage is acquired by a partial molt, including the body plumage, middle and lesser coverts, tertials, and central tail feathers, during February through May. Adult Little Stints in late spring appear strikingly rufescent on the upperparts, particularly when compared with flocks of any North American species. The overall coloration is paler, almost more orange, than the tones of Western

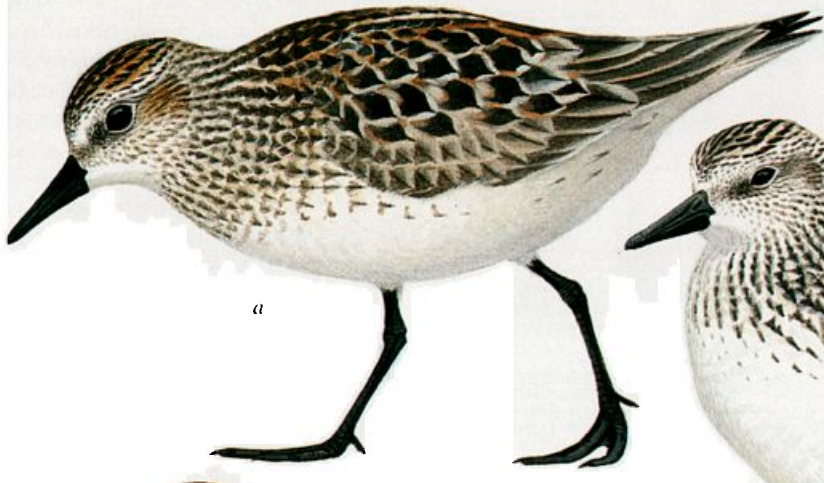


Figure 14. Juvenile Little Stint. England, September. Photo/R. J. Chandler.



Figure 15. Juvenile Little Stint of "gray morph." England, September. Photo/R. J. Chandler





a



b



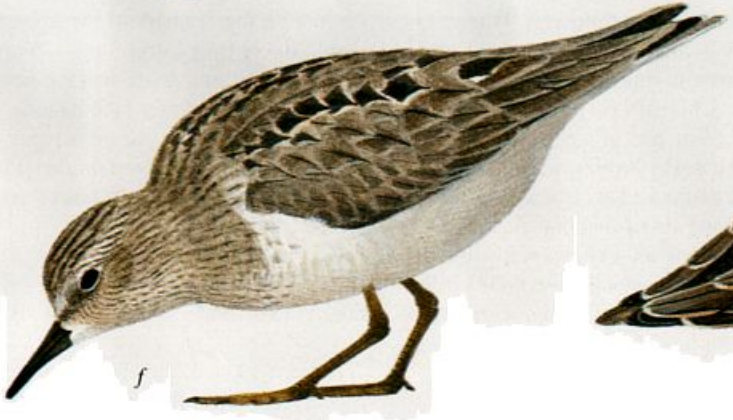
c



e



d



f



g



Figure 16. Rufous-necked Stint in alternate plumage. Alaska, May. Photo/P. A. Buckley.



Figure 17. Juvenile Rufous-necked Stint. Japan, September. Photo/T. Shioto.

Sandpipers, and is much brighter than any Least Sandpiper. The cinnamon/rufous coloration is brightest on the auriculars, crown, scapulars, and tertials, but is present throughout the upperparts and usually continues as a suffusion across the upper breast. Early in spring, when the plumage is fresh, the rufescent coloration is somewhat concealed by whitish tips to the feathers of the upperparts, so that the bird appears lightly dusted with flour. The extensive rufescent tones on the face and breast of adult Little Stints make them most likely to be confused with Rufous-necked Stints. This similarity is most obvious during mid- to late summer, when feather wear reveals the

maximum amount of rufous about the head, neck, and upper breast. Little Stints in such condition differ from Rufous-neckeds in the following ways: 1. The throat is always white in the Little Stint and usually rufescent in the Rufous-necked. 2. The rufous face and neck of the Little Stint are always streaked or spotted with dusky brown, while this area in the Rufous-necked is clear and unspotted. Assessing this particular feature, of course, requires an exceptionally close view. 3. The inner wing coverts of Little Stints are light to dusky brown with rather broad buffy or rufous edges, while those of Rufous-neckeds are cold gray with dark shaft streaks. Similarly, the ter-

tials of adult Little Stints tend to be dusky brown with broad, bright rufous fringes, while those of Rufous-neckeds tend to be lighter gray with narrow rufous edges or no rufous edges. For Little Stints which are very heavily worn, or in advanced pre-basic molt (Plate 5c), the coloration of the middle and greater coverts is the most consistent distinction from the Rufous-necked Stint. 4. The rufescent cast in Little Stints is lighter, or more yellowish, than that of the Rufous-necked Stint. 5. Little Stints, when fresh, show mantle and scapular "V" marks, and these are frequently apparent even on abraded birds. Rufous-necked Stints show, at most, one set of "V" marks, and then only in very fresh plumage. 6. The crown of Little Stints is more uniformly dark than that of the Rufous-necked Stint, and a chain of speckles occurs frequently on the crown and lores, as in the Long-toed Stint.

#### Definitive Basic Plumage (Plate 4b)

This plumage is acquired by a complete molt between August and October. Because the distinctive inner wing coverts (see under Alternate Plumage) are often shed last, some basic-plumaged adults in fall can still be separated from Rufous-necked Stints by this character. In basic plumage, Little Stints are generally darker, with a more olive cast, on the upperparts than the other black-legged peeps. Many individuals have a patchy appearance on the upperparts, including the scapulars, because of the indistinct, "blobbed" shaft streaks (Plate 4a). Little Stints occasionally show an incomplete breast band of dusky speckles, which Rufous-neckeds seldom have.

Many basic-plumaged, dark-legged stints that lack webbing between the toes may be unidentifiable in the field. However, such a bird with a strong suggestion of a breast band as well as prominent dark centers on the feathers of the upperparts would likely be a Little Stint. Compared with Little Stints, basic Rufous-neckeds seem to have a dingier face pattern, with a more obscure supercilium, and look more dingy and smudged on the sides of the breast, but these differences require further study.

#### Juvenal Plumage (Plate 2a, b, c, j; Figure 13)

At first glance, juvenile Little Stints appear very brightly colored, with con-

trastingly patterned upperparts and bright buffy breast bands. They schematically resemble juvenile Least Sandpipers, but are more brightly colored and are whiter on the breast and face. By September, the plumage may be very faded. The four characters most typical of juvenile Little Stint are: 1. Two distinct "V" marks on the upperparts, one of these formed by white tips on the outer mantle feathers, and the second by white tips on the lower row of upper scapulars. 2. The greater and middle coverts, particularly the anteriormost ones, and the lower scapulars, have broad, dusky brown centers that conceal the shaft streak, buff or rufous edges, and sometimes, whitish tips. The tertials are also patterned like the lower scapulars—dark brownish black with bright but narrow rufous edges. Some birds have coverts that closely resemble those of the Rufous-necked Stint (Fig. 14, Pl. 2a). Such individuals pose very difficult identification problems. They usually lack the distinctive anchor-shaped subterminal spots seen on the coverts of Rufous-neckeds, and have paler faces, buffier (not dirty gray) breasts, and crisper markings on the breast sides. 3. Little Stints have a gray nape that contrasts strongly with the dark crown and bright mantle. 4. The very dark crown forms a dark ridge, which is emphasized by a bright whitish lateral crown stripe (*cf.* Pl. 2i and j).

The breast of juvenile Little Stints is washed with buff, brighter than the gray wash of Rufous-neckeds, and tends to be more clearly streaked with dusky brown at the sides. The lack of gray on the breast of Little Stints results in a noticeably white-fronted appearance. Furthermore, the anteriormost wing coverts of Little Stints are especially dark, sometimes giving a dark-shouldered look reminiscent of a Sanderling. An occasional Little Stint (Fig. 15) lacks rufescent fringes to the upperparts and looks exceedingly pale. Such birds, which presumably are the basis for allusions to "gray-phase" Little Stints, perhaps represent a polymorphism or an aberrant lack of melanin.

#### *First Basic Plumage* (Plate 4a)

This plumage is acquired by a complete molt, the body feathers between October and December and the primaries between December and April. The juvenile wing coverts are retained until at least December, sometimes until April, which permits aging of most winter birds.

#### *First Alternate Plumage* (Not illustrated)

Unlike most other stints, one-year-old Little Stints usually follow the adults to the breeding grounds. Some individuals acquire a first alternate plumage that is indistinguishable from that of the adults, while others are very similar to winter-plumaged birds.

### **RUFIOUS-NECKED STINT**

*Calidris ruficollis*

#### *Distribution*

Rufous-necked Stints are a high arctic species, breeding along the northern coast of Siberia from the Taymyr Peninsula east to the Chukotskiy Peninsula, and also in western and northern Alaska along the coasts of the Seward Peninsula and around Point Barrow. They winter mainly in southeast Asia, from China and Burma east through Malaysia to New Guinea, Australia and New Zealand. The largest numbers of migrants are recorded, in both spring and fall, in Japan, China, and the Philippines. Migrants are regular in the Aleutian Islands and along the west coast of Alaska. Vagrants have been seen in North and South America, in western Europe, and in South Africa.

#### *Structure*

Compared to Little Stints, Rufous-necked Stints have a more elongated and squat body shape, an effect that is enhanced by the shorter tarsi and longer wings. Like Little Stints, they have blackish legs and lack webbing between the toes. The central tail feathers are comparatively long, sometimes projecting beyond the primary tips. The wings of Rufous-necked Stints are longer than those of any other small *Calidris*, so that their hind end is particularly attenuated.

Rufous-necked Stints have rather abruptly sloping foreheads and short bills with stout bases, and so are more like the Semipalmated Sandpiper than the Little Stint in head shape. The bill of the Rufous-necked is usually straight, but is occasionally slightly drooped. The extent of variation in bill size is enough so that distinction from either heavy-billed Littles or short-billed Semipalmateds is not possible on this character alone. Western and Semipalmated sandpipers usually appear longer-legged and have a more erect stance than Rufous-necked Stints.

#### *Calls*

Two calls are regularly given in flight: a rolling "chirrk," higher-pitched and more squeaky than the call of the Semipalmated Sandpiper; and a drier, flatter "chit" or "chut," with the quality of the Little Stint but not as piercing. The latter call is sometimes uttered in a series.

#### *Definitive Alternate Plumage*

(Plate 5d, e)

This plumage is acquired by a partial molt, including the entire body plumage and some wing coverts, during March to May. Individuals in full plumage are easily identified by the bright rufous or tawny "gorget," which is clear and unstreaked on the throat, sides of neck, and the facial region just below the eye. The reader should beware, however, of schematically similar, although larger, Sanderlings. A band of dusky spots, largest and most intense at the sides of the breast, encircles the upper breast below the gorget, but does not extend onto the throat. Thus, an abrupt demarcation is apparent near the center of the breast. There is a vague whitish patch encircling the base of the bill. The other most striking feature of the Rufous-necked Stint is the strong contrast between the dusky brown scapulars and the pale gray or brownish gray wing coverts and tertials. Some unusually bright individuals may have a few middle and greater coverts that are "summer"-patterned (*i.e.*, dusky with rufous fringes), thus resembling the coverts of Little Stints, but such individuals will be so bright about the head as to be unmistakable. Fresh-plumaged individuals have a frosted appearance (Fig. 16) due to whitish tips to the entire upperparts, so that they lack the two discrete "V" marks of Little Stints.

#### *Definitive Basic Plumage* (Plate 3a, b)

This plumage is acquired by a complete molt of the body plumage between July and October. The primaries may be replaced either on the wintering grounds or during migration (Cramp and Simmons 1983). The feathers of the foreneck, the inner wing coverts, and the tertials are ordinarily the last to be replaced, so that birds in advanced molt (Plate 3a) can be identified readily.

The basic plumage is paler gray above than that of Little Stints, and is less frequently "blotched" on the upperparts be-

cause the dark feather centers are reduced to fine shaft streaks. Rufous-necked Stints with patchy or blotched upperparts in the British Museum collection examined by Jonsson proved to be misidentified Little Stints. However, the feathering may darken with wear, which would tend to obscure this difference.

The following points of distinction between basic-plumaged Rufous-necked and Little stints have been drawn partly from discussions between Jonsson and Killiam Mullarney in 1984. 1. The grayish patches at the sides of the breast of Rufous-necked Stints are more prominent than those on Little Stints, due to a clearer white wedge that extends upwards in front of the bend of the wing. 2. The grayish breast patches, auriculars, nape, and hindneck are less heavily streaked on the Rufous-necked. 3. The lores and feathering in front of the eye are darker on Rufous-neckeds, and enhance the whitish forecrown. 4. Some Little Stints develop a complete pectoral band of dusky speckles, white Rufous-neckeds never do.

Rufous-necked Stints in basic plumage are very difficult to distinguish from Semipalmated Sandpipers on plumage characters alone, and one must thus rely on lack of webbing in the Rufous-necked.

#### *Juvenal Plumage* (Plates 1a, b; 2i)

Schematically, the upperparts of juvenile Rufous-necked Stints are most similar to those of Western Sandpipers, but the brightness of their upperparts, combined with the short bill and lack of webbing of Rufous-neckeds, make them most similar to Little Stints. Many Rufous-necked Stints, especially worn individuals, appear grayish and nondescript, and are therefore more similar to Semipalmated Sandpipers than to Little Stints.

If the presence of webbing cannot be confirmed on a bird in question, the following plumage characters are useful in separating juvenile Rufous-necked Stints from juvenile Semipalmated Sandpipers. 1. Rufous-necked Stints normally have bright cinnamon/rufous fringes to the crown, mantle, scapulars, and tertials. The rufous coloration is most prominent on the mantle and upper scapulars, where the feather centers are contrastingly dark. This last area contrasts strongly with the pale gray lower scapulars and wing coverts; such a contrast is not normally evident in Semipalmated Sandpipers. 2. The facial pattern of Rufous-necked Stints is

usually less prominent than that of Semipalmated Sandpipers, mainly because the auriculars are paler in the former species and therefore contrast less. On Rufous-necked Stints, the dark lores and white forecrown are the two most prominent features in the facial region.

For separation of juvenile Rufous-necked Stints from Little Stints, the color pattern of the wing coverts, lower scapulars, tertials, and sides of the breast are critical: 1. Rufous-necked Stints have pale gray wing coverts that lack contrastingly dark centers and bright buff or rufous fringes. Fresh individuals have pale buffy edges and tips to the wing coverts, but these wear off quickly. Little Stints, on the other hand, have brightly patterned wing coverts, which, because of their dark centers, are patterned more like the upperparts. The three anteriormost middle and greater coverts on the Rufous-necked Stint usually lack the solid dark centers of those of Little Stints, so that the dark shaft streak can be discerned in good light. 2. Similarly, the tertials of Rufous-necked Stints are pale gray with visible shaft streaks, while those of Little Stints are solidly dark. 3. Each of the lower scapulars of Rufous-necked Stints is pale gray with a suffused, dark, subterminal spot, much less extensive than the corresponding dark centers of Little Stints and not so clearly anchor-shaped as on Semipalmated Sandpipers (Fig. 10). 4. The pectoral band of Rufous-necked Stints is grayish, with faint and diffuse streaks towards the sides and a blush of pale buff in fresh individuals. The breast band is distinctly darker and grayer, not as buffy as that of a Little Stint in fresh plumage. 5. The whitish tips to the upper scapulars and mantle feathers never converge as two distinct "V" marks, as they usually do on Little Stints, but appear rather as a diffuse series of speckles. Some juvenile Rufous-necked Stints have wing coverts and tertials that look as dark as those of typical Little Stints. This may be a result of feather wear. Such Rufous-neckeds usually differ from Littles in having smudged grayish breast sides and a more diffuse face pattern. One such bird (Fig. 17) shows all the characters of the Rufous-necked *except* that the coverts and tertials appear dark.

#### *First Basic Plumage* (Not illustrated)

This plumage, consisting of new body feathering and one or two tertials and tail feathers, is acquired in October and No-

vember. As the pale fringes to the wing coverts are quickly lost through abrasion, birds in first basic plumage are usually difficult to distinguish from adults in the field unless the contrast between coverts and mantle can be discerned.

#### *First Alternate Plumage* (Not illustrated)

Acquired by a partial molt, including the body feathers, tertials, and rectrices, this plumage varies in intensity of coloration. One individual seen at Monomoy Island, Massachusetts, in late June 1980, (Veit and Petersen 1982) was a bit paler than the adult in Plate 5. The intensity of the plumage coloration attained reflects the hormonal condition of the bird. Thus, those wintering in the southernmost portion of the winter range look most like basic-plumaged birds during their first summer. These birds look like basic adults, but the feathers of the upperparts have more extensive dark centers. Thus, in spring they resemble Semipalmated Sandpipers on the upperparts, but lack heavy streaking on the breast and flanks. In Australia during June through August, all individuals in first alternate plumage show "some" rufous on the facial area and scapulars (Paton and Wykes 1978).



**Figure 18.** *Least Sandpiper* in first basic plumage. California, October. Photo/L. Jonsson.

### **LEAST SANDPIPER** *Calidris minutilla*

#### *Distribution*

This abundant and widespread North American species breeds in sub-arctic



Figure 19. Typical stance and head pattern of juvenile Long-toed Stint.

and boreal regions, farther south than either Western or Semipalmated sandpipers, from western Alaska, Southampton Island, and northern Labrador, south to northwestern British Columbia, northern Ontario, and Nova Scotia. They winter, mainly in coastal areas, along the Pacific coast of North America north to Oregon, along the East Coast north to North Carolina, and also in Central America, the West Indies, and in South America south to southern Peru and Suriname.

On migration through North America, Least Sandpipers usually avoid the open tidal flats preferred by Semipalmated and Western sandpipers, and feed instead in grassy pools at the upper reaches of salt marshes, among *Spartina* grasses on marshes, and around the edges of freshwater pools. This behavior, however, varies from location to location and between seasons. For example, spring migrant Least Sandpipers feed on tidal flats in Newburyport, Massachusetts, in May, but forage among the *Spartina* during the fall. Despite these differences in foraging behavior, Least frequently roost at high tide in mixed flocks with other species of peeps.

#### Behavior and Structure

Least Sandpipers differ behaviorally from the larger North American peeps in that they usually prefer the more grassy parts of marshes, rather than the exposed tidal flats. Their comparatively hunched posture gives them a creeping appearance as they feed. The neck is short, the bill small, and the primaries hardly project beyond the tail. The forehead is very steep, as the peak of the crown is located forward of the eye (*cf.* Long-toed Stint). Compared to Semipalmated Sandpipers,

Least have very slender, finely pointed bills, which appear to curve gradually throughout their length, due mainly to the upward curvature of the lower mandible. From a distance, Least Sandpipers' bills are so tiny as to be almost invisible, which is not the case with Semipalmated or Western sandpipers.

When flushed, Least Sandpipers rise almost vertically from the ground in a series of horizontal lurches ("towering") rather than flying directly away. The wingbeats look weak and fluttery when the bird flushes in this fashion. The light wingbar is less obvious than on other North American peeps, but more prominent than in the Long-toed Stint.

In most circumstances, Least Sandpipers are easily identifiable and are only liable to be confused with Long-toed or possibly Temminck's stints because of their yellowish legs. In Least Sandpipers, the legs vary from a pale olive green to a clear dull yellow, but sometimes look dark when covered by mud, in which Least frequently forage.

#### Calls

The most frequently uttered call is a high-pitched, drawn out and rolling "chrreep," or sometimes a disyllabic "kre-ep." Least also give a fainter "kleep" or "chuiip" without the rolling "r" quality. Compared with the Long-toed Stint's, the Least Sandpiper's call is higher-pitched and less musical; compared to that of Temminck's, it is slightly lower in pitch and less ringing.

#### Definitive Alternate Plumage (Plate 6c, d)

The definitive alternate plumage is acquired in a partial molt involving the body plumage, tertials, central rectrices and often several wing coverts, between January and April.

In alternate plumage, Least Sandpipers look dark brown from any distance. Bright cinnamon/rufous barring on the scapulars, tertials, mantle, crown, and auriculars give some individuals a rufescent cast, so that they approach Long-toed Stints in upperpart coloration. The head and breast look dingy, and are heavily streaked with dusky. The supercilium is dirty gray, and therefore not prominent. The tiger-stripping of the scapulars, tertials, and some greater coverts is more complex than on other species of peeps except the Long-toed Stint. The pattern-

ing of these feathers is such that when worn, by late July, the entire upperparts appear solidly dusky (even darker than Plate 6d).

#### Definitive Basic Plumage (Plate 4e)

This plumage is acquired by a complete molt mainly between August and October. Birds that winter in South America postpone the body molt until their arrival there in mid-August, while those wintering in California begin replacing body feathers in July. Therefore, basic-plumaged birds are rare in the Northeast, but are frequent elsewhere.

Overall, basic-plumaged Least Sandpipers appear dark brownish gray and rather blotched on the upperparts and have a complete dusky pectoral band. The blotching or heavy spotting on the upperparts is the result of broad and diffuse shaft streaks, rather than of uniformly dusky feather centers, as in Long-toed Stints. By January, however, when new, dark-centered alternate feathers begin to appear, and old basic feathers are abraded, the overall coloration resembles that of the Long-toed Stint more closely. In fresh plumage, the pectoral band looks uniformly dusky, but it becomes more streaked during the course of the winter as alternate feathers grow in. A grayish supercilium and whitish eye ring are rather pronounced compared with dark-legged peeps, but are not so distinct as in the Long-toed Stint.

The pattern of the upperparts, in addition to that of the facial area described under the juvenal plumage (Fig. 18), is the best means of distinction from a basic-plumaged Long-toed Stint, which is also somewhat paler on the breast.

#### Juvenal Plumage (Plate 2e, k)

Juvenile Least Sandpipers stand out clearly in flocks of Semipalmated or Western sandpipers because of their dark rufescent upperparts and complete, speckled pectoral bands. On fresh individuals, white tips to the mantle feathers and scapulars converge to form two striking "V" marks, so that from above, they schematically resemble juvenile Little Stints.

Juvenile Least Sandpipers most closely resemble juvenile Long-toed Stints. The most consistent differences are: 1. Head pattern: Least Sandpipers have "dirtier" facial patterns and are less crisply streaked on the cheeks than Long-toed Stints. The ground color of the face is a

dirty gray, rather than whitish, as on Long-toed Stints. On Least, the auriculars are darkest at the rear end, so that the auricular patch appears removed from the eye (cf. Plate 2d, e). The loreal region of Least Sandpipers is dark, broad, and straight, and connects the eyes with the bill as a "mask." The eye ring is obvious, and the eye itself appears oval; the combined effect is a somewhat oriental expression. The forehead is light enough so that the supercilia appear continuous over the bill, whereas in the Long-toed Stint the forecrown is dark. 2. The wing coverts of Least Sandpipers are pale gray with complete buff or cinnamon/rufous fringes that give the wing a warm brown cast. Long-toed Stints, on the other hand, have darker gray wing coverts with whitish edges that are broken at the tip, altogether giving a colder, blacker cast to the wings.

#### First Basic Plumage (Plate 4f)

This plumage is acquired by a molt that is either complete or partial; those wintering in South America replace all feathers except some outer primaries and wing coverts between September and November, while those wintering in California molt only the body plumage during the same time period.

First-winter birds retain the juvenal wing coverts, and sometimes a few tertials, so that these birds may be distinguished from adults if the pale buffy fringes of the coverts and tertials have not worn off. Aging by these criteria is possible until at least January.

#### First Alternate Plumage (Not illustrated)

This plumage, which closely resembles the definitive alternate, is acquired by a partial molt between March and May, or about one month later than adults. Age determination of such birds is not ordinarily possible in the field.

### LONG-TOED STINT

*Calidris subminuta*

#### Distribution

The Long-toed Stint is the least studied of all the small *Calidris*. Its breeding range is quite large, extending from the Ob River in central Russia east to Ana-

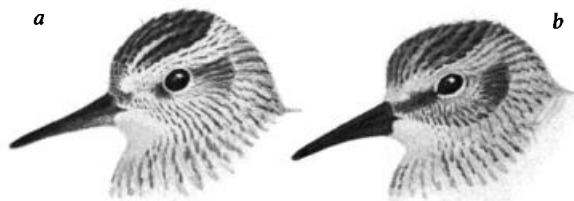


Figure 20. Comparison of juvenile Long-toed Stint (a) and Least Sandpiper (b).

dyrskaya, the Commander and Kuril Islands, and the northern Sea of Okhotsk, and also south to Lake Baikal. Very little information is available on the breeding of Long-toed Stints, and Dement'ev *et al.* (1959) list about six known records of nests, most from the "alpine zone of east Siberia." The evidence available suggests that Long-toed Stints breed in habitats similar to those used by Least Sandpipers.

Long-toed Stints winter in southeast Asia, from southern India, southeast China, and the Philippines south through the Malay Peninsula, Java, and Borneo to northern Australia. Migrants occur regularly in the western Aleutian Islands during spring and fall, and vagrants have appeared west to Sweden and Britain and east to Oregon.

#### Behavior and Structure

The scant information available suggests that migrant Long-toed Stints feed in inland, grassy pools more often than on open tidal flats, and thus seem closest to the Least Sandpiper in habitat preference.

Long-toed Stints owe much of their rather distinctive shape and posture to their especially long toes (mainly the central one) and legs. If the feet can be seen clearly, the spindly toes give the impression of an awkwardly large foot, as on a gallinule or jacana. Long-toeds also appear to have comparatively small heads, thin necks, and a short stern, so that the overall shape is more suggestive of a Sharp-tailed Sandpiper (*Calidris acuminata*) than of a Least Sandpiper. The bill is typically straighter than that of a Least Sandpiper, due to less curvature in the lower mandible, and is very finely pointed. There is a dirty yellowish base to the lower mandible. The forehead is less abrupt than on a Least Sandpiper; this, particularly when the neck is extended, gives the bird a delicate appearance. When in an alert posture, Long-toed Stints are vaguely reminiscent of a small *Tringa*, such as a Solitary Sandpiper (*T. solitaria*), an impression never conveyed

by the crouching Least Sandpiper.

The legs range from olive or dull yellow in juveniles to dull orange in breeding adults. In flight, Long-toed Stints look very dark, with conspicuously dark-banded underwings, and a very faint wing stripe. They occasionally flick their wings rigidly, as do Spotted Sandpipers (*Actitis macularia*). The toes protrude beyond the tail, which is never the case in any other peep except the Western Sandpiper.

#### Calls

The most typical call is a softly rolling "chrrup," somewhat resembling that of the Curlew Sandpiper (*Calidris ferruginea*), and obviously lower-pitched and more liquid, or musical, than that of a Least Sandpiper.

#### Definitive Alternate Plumage (Plate 6e)

The definitive alternate plumage is acquired by a partial molt, involving the body plumage, tertials, central rectrices, and most wing coverts, from March to May. Long-toed Stints in this plumage appear bright rufescent above, including some wing coverts, and therefore resemble alternate-plumaged Little Stints



Figure 21. Juvenile Temminck's Stint, British Columbia, early September. Photo/D. Paulson.

Some specimens we have examined, which may be one-year-olds, are rather drab above due to extensive gray-brown fringes to the feathers of the upperparts. Most individuals, however, are boldly striped with blackish and rufous, and are therefore much more vividly patterned than any Least Sandpiper. The head pattern is distinctive: the crown is dark brown with fine rufous streaks and bordered below by a broad, whitish, and sharply defined supercilium that extends well beyond the eye and gives the bird a distinctly capped appearance. The crown is dark all the way to the base of the bill, and to the lores, so that there is no whitish forecrown as in a Least Sandpiper (Fig. 18). The continuous dusky coloration between the lores and forecrown is only shared by some alternate-plumaged Little Stints.

The breast is clearly streaked at the sides, but usually unmarked in the center, and is entirely suffused with a cinnamon/rufous wash. The breast pattern thus resembles that of juvenile Sharp-tailed Sandpipers. A yellowish "V" mark is often obvious on the mantle.

#### *Definitive Basic Plumage* (Plate 4c)

This plumage is acquired by a complete molt of the body feathers in August and September. A few alternate-patterned feathers are found on winter specimens, and appear to be newly grown.

The Long-toed Stint has the darkest upperparts of any basic-plumaged peep. The only likely confusion at this stage would be with a Least Sandpiper.

The pattern of the feathers of the upperparts is different from that of Least (Plate 4c, f). Long-toed Stints have broad dark centers and discrete pale fringes to these feathers, while on Least the dusky shaft streaks are diffuse and the feathers become gradually paler toward the edge.

The head pattern differs from that of Least Sandpipers as it does in juvenile plumage, but is somewhat less clearly marked.

#### *Juvenal Plumage* (Plates 4d; 2d, 1)

Juvenile Long-toed Stints are most similar to Least Sandpipers of the same age, but are more contrastingly colored and generally more striped above, recalling vaguely the pattern of juvenile Pectoral Sandpipers (*Calidris melanotos*). The cap is very dark with fine rufous streaks.

The supercilium is broad and whitish, and extends beyond the auriculars to the back of the head. There are two distinct, whitish, lateral crown stripes (Fig. 19). The breast is finely streaked, more extensively than in a Least Sandpiper, so that the streaks more often continue to the center. The feathers of the upperparts have dark brown centers, cinnamon/rufous fringes, and whitish tips on the scapulars. The intensity of the fringes varies from a pale, almost orange-buff to a dark rufous or tawny. The individual in Plate 4d is abraded; fresh individuals are much brighter. Two sets of "V" marks, one on the mantle and one on the scapulars, are usually more conspicuous than those on Least Sandpipers, but are similar to those of Little Stints.

The following characters are the most consistent differences between Long-toed Stints and Least Sandpipers: 1. The greater, middle, and lesser wing coverts of Long-toed Stints are slate gray with broad whitish or cream-colored edges that are broken at the tips. The coverts therefore contrast as colder than the rufous and blackish scapulars. Least Sandpipers have complete warm buff or rufous fringes to the wing coverts, so that there is no strong contrast between the wings and scapulars. 2. The head pattern of the two species is quite different (Fig. 20). On Long-toed Stints, the dark crown and whitish, black-flecked supercilium produce a strongly capped effect not unlike that of juvenile Sharp-tailed Sandpipers. In Long-toeds, the dark crown continues to the base of the bill, and the lores are whiter than in Least Sandpipers.

#### *First Basic Plumage* (Not illustrated)

This plumage is acquired by a partial molt, involving most of the body feathers, some tertials, and some rectrices, between September and November. The wing coverts, as well as one or two tertials, are usually retained, permitting identification of young birds in mid-winter.

#### *First Alternate Plumage* (Not illustrated)

This plumage, acquired by a partial molt during April and May, resembles the definitive alternate plumage except for the retained juvenal flight feathers, tertials, and wing coverts. Some individuals acquire feathering that more closely resembles the basic plumage at this stage.

## TEMMINCK'S STINT

*Calidris temmincku*

#### *Distribution*

Temminck's Stint is a widespread Palearctic species, breeding in arctic and sub-arctic regions from Scotland and central Scandinavia east along the coastal portions of northern Russia to Anadyrskaya and the Chukotskiy Peninsula. It winters in tropical sub-Saharan Africa, in the Mediterranean Basin, the Arabian Peninsula, India and southeast Asia south throughout the Malay Peninsula. Migrants occur regularly in the western Aleutian Islands, and vagrants have reached the northwestern coast of the United States. They are nowhere especially numerous, flocks of 100 to 200 birds being unusual at any location. Most seem to be found singly or in small groups at inland sites along the muddy margins of freshwater lakes, ponds, and rivers, or at pools in grassy marshes.

#### *Structure and Behavior*

Temminck's Stint is the most distinctive of all the peeps, and is therefore usually comparatively easy to identify. It has a crouching, horizontal posture, with an elongated silhouette suggestive of a Baird's Sandpiper. The neck is short, the head small and rounded, and the bill short, finely pointed, and slightly decurved due to a curvature in the lower mandible. The bill often has an olive cast, particularly toward the base. The legs are relatively short for a peep, and vary in color from olive to dark yellow.

When flushed, Temminck's Stints "tower" as do Least Sandpipers, with fluttery, energetic wingbeats, often calling repeatedly.

#### *Calls*

The typical flight call is a characteristic short "tree," with a rather high, ringing quality. This call is often repeated in rapid series.

#### *Definitive Alternate Plumage* (Plate 6f, g)

This plumage is acquired through a partial molt including most body feathers, wing coverts, and central tail feathers, during the period February to May

Birds are especially drab on the upperparts at this stage, compared with other peeps, lacking strong rufous tones or whitish tips to the feathers. The mantle and scapulars include a variable number of basic-patterned gray feathers mixed with alternate-patterned ones, which are blackish in the center with rufous and buff fringes. Some individuals acquire a "full" alternate plumage, but a "mixed" impression illustrated by Plate 6f and g is more typical. There is a dirty gray, faintly streaked "bib" across the upper breast that suggests the analogous pattern in juvenile Spotted Sandpipers. Unlike all other peeps, Temminck's Stints lack prominent streakings at the side of the breast in alternate plumage. There is a conspicuous eye ring in this and other plumages, but the supercilium is inconspicuous.

The tail is rather long and the outer two pairs of tail feathers are white, unlike those of all other species, in which these feathers are gray. This character is striking on individuals flushed at close range, but is otherwise difficult to see.

#### *Definitive Basic Plumage* (Plate 4g)

This plumage is acquired by a complete molt of the body plumage between July and September, although the primary molt may be arrested and then not completed until April.

In basic plumage, Temminck's Stints are uniformly dark neutral gray on the upperparts and upper breast. The uniformity of the coloration on the breast gives the bird a hooded appearance. Basic-plumaged Temminck's Stints are only likely to be confused with Least Sandpipers and Long-toed Stints. Temminck's Stints differ from both those species in: 1. Lacking a supercilium behind the eye. 2. Lacking pronounced streaking or speckling on the breast. 3. Lacking conspicuous dark feather centers on the upperparts. Temminck's Stints also have a rather prominent eye ring. Questionable birds can always be flushed to reveal the color of their outer tail feathers.

#### *Juvenal Plumage* (Plate 2f, Figure 21)

Juvenile Temminck's Stints are the most distinctive of all peeps. The most striking aspect of this plumage is the presence of dark subterminal bars and buff fringes on the mantle, scapulars, and tertials, schematically resembling the pattern of juvenile Red Knots (*Calidris canutus*). The subterminal bars on the up-

permost scapulars are the broadest, producing a dark-spotted effect. There is an olive cast to the entire plumage, and the feathers also lack extensive dark centers.

The head appears very uniform, lacking any distinctive pattern. There is a pale supercilium that extends slightly beyond the eye. As in basic plumage, there is a brownish wash on the upper breast, which extends down each side in lateral patches, similar to the pattern of non-breeding Spotted Sandpipers.

#### *First Basic Plumage* (Not illustrated)

This plumage is acquired in a partial molt during August to December, and includes the body feathers, some wing coverts, and the central tail feathers. It seems unlikely that immatures can be distinguished from adults after the basic plumage is acquired.

#### *First Alternate Plumage* (Not illustrated)

This plumage is acquired in a partial molt of the body feathers, wing coverts, and tertials during April to June. These individuals are inseparable from adults in the field.

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