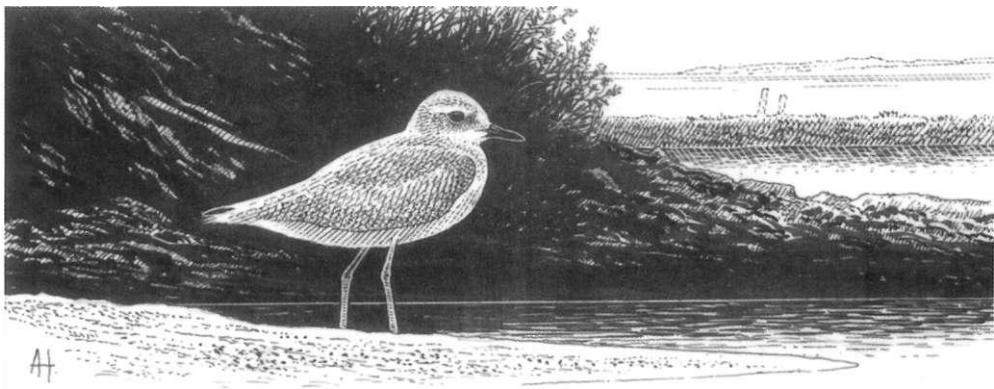


# Identification, taxonomy and distribution of Greater and Lesser Sand Plovers

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Greater Sand Plover

**ABSTRACT** Separating Greater *Charadrius leschenaultii* and Lesser Sand Plovers *C. mongolus* is far from simple, especially since the various subspecies of the two show some overlap in morphology and biometrics (as well as geographical distribution).

On the basis of extensive field observations and detailed examination of about 300 museum specimens of each species, identification criteria are presented. Important characters are considered to be bill shape, length of bill nail, wing-bar shape, prominence of subterminal tail-bar and (in breeding plumage) shape of breast-band; other supporting or inconclusive characters are also discussed. A major

pitfall is that the small race *columbinus* of Greater has a bill closely approaching that of Lesser, although never so blunt-tipped as on any race of the latter. For both species, populations are placed into geographical groups

according to biometrics: from these data, supported where possible by other factors, subspecies are defined. Three races of Greater are recognised: nominate *leschenaultii*, *columbinus* and *crassirostris*. Five subspecies of

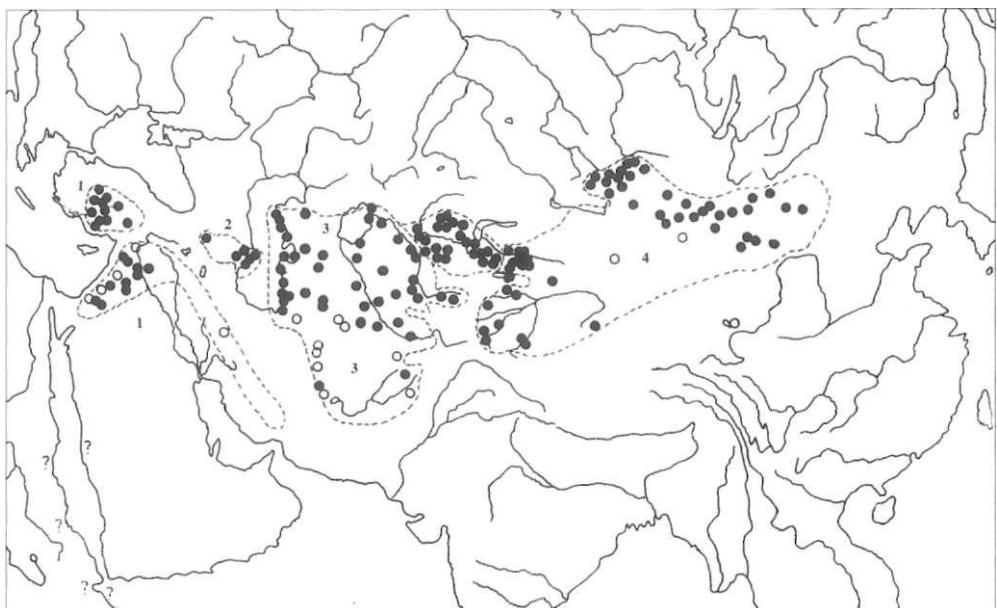
Lesser are recognised: nominate *mongolus* and *stegmanni* (the ‘*mongolus* group’), and *pamirensis*, *atrifrons* and *schaeferi* (the ‘*atrifrons* group’, possibly an incipient separate species). Even in breeding plumage, subspecific identification of Lesser Sand Plover requires great caution, as wide variation occurs within populations and intermediates are frequent. Identification of juveniles and non-breeding adults is possible only with careful and precise assessment of structure, ‘jizz’, and upperwing and uppertail patterns. Greater (especially *columbinus*) has an earlier post-breeding (and pre-breeding) moult than Lesser, which does not moult until arrival on winter grounds. In Europe, a vagrant sand plover in full or nearly full summer plumage after mid August is likely to be a Lesser, as also are a small *mongolus/columbinus*-type in breeding plumage in July or early August and a small individual in active wing moult after September; by contrast, a small sand plover in full summer plumage in February or March is likely to be a *columbinus* Greater, as is a juvenile appearing in western Europe in June or early July.

From this study and existing literature, the global breeding distributions of each species and its subspecies are reassessed. A tentative picture of winter distributions of all races is drawn up, based on biometrics and to some extent on plumage darkness. Of particular note is the fact that western populations of nominate Greater appear to migrate at least partly southwest rather than southeast, and that a possible breeding population of Greater (resembling *columbinus*, but shorter-winged) exists along the Red Sea.

**D**istinguishing Greater Sand Plover *Charadrius leschenaultii* from Lesser Sand Plover *C. mongolus* is notoriously difficult, especially for observers with limited experience of the two species. Both are divided into several distinct subspecies, which sometimes approach or overlap each other in morphological appearance, in some biometrics and in geographical distribution. Identification papers in the early 1980s (e.g. Sinclair & Nicholls 1980; Taylor 1982) even contained photographs of birds which were wrongly identified, which underlines the complexity of this species pair. Both species are highly prone to vagrancy, with at least 66 records of Greater and ten of Lesser in Europe, and 13 records of Lesser in North America south of Alaska.

This paper is based on field experience of tens of thousands of Lessers and thousands of Greaters, including ringed individuals, in Bahrain, UAE, Oman, Turkey, Egypt, northeast Africa, Israel and Pakistan. Extensive museum

research has also been carried out by all three authors, especially by CSR in connection with his earlier texts for *BWP* (vol. 3). The latter were based largely on material in the zoological museums of Amsterdam (ZMA), Leiden (RMNH, now NNM) and Tring (BMNH); in ZMA and NNM, all relevant skins were measured and examined for plumage characters and moult; the same applies especially to breeding-plumaged adults in the BMNH (many of which are spring or late-summer/early-autumn birds from wintering or migration areas, rather than from breeding grounds), while less attention was paid to birds in juvenile and non-breeding plumages. Since the publication of *BWP*, additional specimens have been examined: all skins of both species in the collections of the zoological museums of Moscow (ZMMU, where many were from the breeding grounds) and Bonn (ZFMK), and a few from the collections of St Petersburg and Berlin. Data on about 300 specimens of each species are now avail-



**Fig. 1.** Breeding distribution of Greater Sand Plover *Charadrius leschenaultii*.

Black dot = probable/definite breeding; open dot = possible breeding. Broken outline = probable breeding area of various populations: 1 Middle East group (*columbinus*); 2 Transcaucasian group (*crassirostris*?); 3 Transcaspian group (*crassirostris*); 4 Eastern group (nominate *leschenaultii*).

Map based on examined specimens and on literature (Aharoni 1931; Andrews 1995; Banzhaf 1933; Baumgart *et al.* 1995; Beaman 1975; Bottema 1987; Cheng 1987; Dementiev & Gladkov 1951; Gavrin *et al.* 1962; Gladkov 1957; Hartert 1912-21; Kasperek 1992; Kitson 1979; Kozlova 1975; Kumerloeve 1961; Kurochkin & Mikhailov 1994; Lehmann 1971; Makatsch 1974; Mauersberger 1975, 1980; Mauersberger *et al.* 1982; Nadler 1989; Nadler & Königstedt 1986; Niethammer 1971, 1973; Niethammer & Niethammer 1967; Nogge 1973; Paevskii *et al.* 1990; Paludan 1959; Piechocki 1968; Piechocki *et al.* 1981; Radde & Walter 1889; Salikhbaev & Bogdanov 1961; Shirihai 1996; Shnitnikov 1949; Stepanyan 1990; Stephan 1994; Stresemann 1928; Sudilovskaya 1936, 1973; Sushkin 1938; Tourenq *et al.* 1996; Vaurie 1965; Vielliard 1969; Zarudnyi 1900).

able, about one-third of these from breeding grounds.

BWP (vol. 3) included much new information on the geographical variation of the two sand plovers. For example, Greater Sand Plover was split into three subspecies, whereas it had previously been treated generally as monotypic (especially as the rather distinctive western subspecies *columbinus* was poorly known at the time); and, for Lesser, the name *schaeferi* was revived to house the characteristically long-billed individuals wintering in the Greater Sundas in Indonesia. Although the measurements and short descriptions of the subspecies contained some information on the reasoning behind these taxonomic decisions, much was left unexplained, and the winter distributions of the various races were inadequately described. The present paper intends to shed more light on the subject.

### Distribution and populations

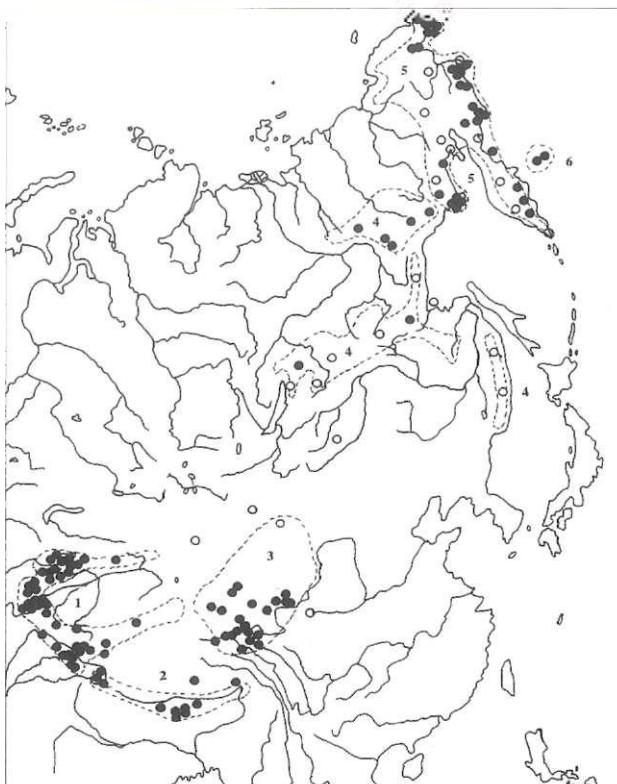
The summer distributions shown (figs. 1 & 2) are based on the existing literature and on findings from this study (see 'Biometrics and geographical grouping', page 178, for a full discussion). Non-breeding distributions are dealt with later (see page 185).

**Greater Sand Plover** (fig. 1) is divided into three subspecies: *columbinus*, *crassirostris* and nominate *leschenaultii*, with *columbinus* not only breeding closest to Europe, but also being the most similar to Lesser Sand Plover owing to its smaller size and 'weak' bill. The race *crassirostris*, which is easier to identify, also occurs in Europe, and, given the long-distance migrations undertaken by these sturdy birds, it is plausible that even the nominate form could turn up. Populations are estimated at below 10,000 individuals of *columbinus*, 65,000

**Fig. 2.** Breeding distribution of Lesser Sand Plover *Charadrius mongolus*.

Black dot = probable/definite breeding; open dot = possible breeding. Broken outline = probable breeding area of various populations: 1 *pamirensis*; 2 *atrifrons*; 3 *schaeferi*; 4 nominate *mongolus*; 5 nominate *mongolus/stegmanni?*; 6 *stegmanni*.

Map based on examined specimens and on literature (Abdusalyamov 1988; Bergman 1935; Cheng 1987; Dementiev & Gladkov 1951; Ivanov 1969; Johansen 1961; Kishchinski 1968, 1980, 1988; Krechmar *et al.* 1991; Kurochkin & Mikhailov 1994; Lobkov 1978, 1983; Mauersberger 1975; Mauersberger *et al.* 1982; Meyer de Schauensee 1937; Nadler & Königstedt 1986; Portenko 1963, 1972; Potapov 1966; Roberts 1991; Schäfer 1938; Shnitnikov 1949; Silem 1934; Stegmann 1930-31; Stepanyan 1990; Stresemann 1940; Stresemann *et al.* 1938; Sudilovskaya 1936, 1973; Tomkovich & Sorokin 1983; Vaurie 1965, 1972; Vorob'ev 1963; Wanhof 1993; Yanushevich *et al.* 1959).



*crassirostris* and over 125,000 *leschenaultii* (del Hoyo *et al.* 1996).

**Lesser Sand Plover** (fig. 2) comprises five subspecies: *pamirensis*, *atrifrons* and *schaeferi* (collectively known as the '*atrifrons* group'), and *mongolus* and *stegmanni* (together forming the '*mongolus* group'). Population estimates are 30,000 *pamirensis*, at least 100,000 *atrifrons*, 25,000-100,000 *schaeferi*, and 25,000-100,000 *mongolus* and *stegmanni* combined (del Hoyo *et al.* 1996).

#### Vagrancy

Up to and including 1996, there were at least 66 accepted records of Greater Sand Plover in Europe, all between April and December, with a peak in midsummer (Mitchell & Young 1997; additional data from national rarities committees, see 'Acknowledgments').

During the same period, ten Lesser Sand Plovers were recorded in Europe, again with most (seven) in June and July. An April 1987 record from former Yugoslavia (see Mitchell & Young 1997) has not, so far as we are aware, been formally accepted and is therefore not included here. Although there are

about 25 published records of Lesser Sand Plover from Cyprus, Flint *et al.* (1997) concluded that none of these was acceptable.

In North America, Lesser Sand Plover is recorded as a migrant and possible breeder in Alaska, south of where it occurs as a vagrant, with records from Alberta, Ontario, Oregon (three), California (five), Louisiana (two), and even New Jersey on the eastern seaboard of the USA (J. Morlan *in litt.*).

#### Field identification

Traditionally, a large number of characters have been used when identifying the two species, but very few of them can be used on their own, and some are even misleading. Field characters which we consider to be, respectively, important, supportive or inconclusive are listed in table 1 (see page 166) and described in detail in the following text.

#### Size and general impression

Typically, Greater Sand Plover is a bulky bird, while Lesser Sand Plover is more delicate and usually looks smaller. The race *columbinus* of Greater, however, somewhat

**Table 1.** Relative importance of field characters for separating Greater *Charadrius leschenaultii* and Lesser Sand Plovers *C. mongolus*.

Important	Supportive	Inconclusive
Bill shape	Leg colour	Bill length in relation to eye
Wing-bar	'Jizz'; apparent length of leg and its position on body	Calls
Subterminal tail-bar	Feeding actions	Tarsus/bill-length ratio*
Shape of breast-band in summer plumage	Length of feet beyond tail (in flight)	White on sides of tail
Length of nail on bill	'Comma' mark on underwing	* This character, however, important with band-bled birds.
	Extension of cinnamon-rufous onto flanks	
	Extent of cinnamon-rufous on upperwing and back	
	Timing of body moult	

approaches Lesser in size and can cause confusion, even among experienced observers. Authoritative field guides (e.g. Alström *et al.* 1991; Hollom *et al.* 1988; Jonsson 1992) give total lengths of 19–21 cm for Lesser and 22–25 cm for Greater; these compare with 20–22 cm for Dotterel *C. morinellus*, and 18–20 cm for both Great Ringed *C. hiaticula* and Caspian Plovers *C. asiaticus*. Such measurements are, however, rather untrustworthy and should be used with great care (note that, even though Great Ringed and Caspian Plovers are given the same size range, any experienced birdwatcher would consider Caspian much larger, as its longer legs and bill make it look bigger than it really is).

A closer look at biometrics reveals an overlap between the two species. According to field guides, the wingspan of Lesser is in the range 45–58 cm and that of Greater within 53–60 cm, while figures published in *BWP* (vol. 3) show that wing and tarsus measurements overlap, as also do weights (Johnsgard 1981). Measurements by CSR, however, show virtually no overlap between the two species in bill length (see Bare parts, on page 169).

The difference in 'jizz' between the two sand plovers may be difficult for a novice to understand, but with experience it is not too difficult, even at long distances. Plates 97 & 98 depict the typical stance of a relaxed individual. It is, however, important to bear in mind that a bird's appearance changes with its posture and general health, and with the ambient temperature (fig. 3).

Greater Sand Plover is the larger-looking of the two. In side view, it has a proportion-

ately large eye situated in the middle of the head, which appears more square than Lesser's, with a flat crown. The long legs are well balanced by an attenuated rear, and the bird's weight is more evenly distributed in front of and behind the legs. Greater usually has a more horizontal stance and body shape, and can often recall a small Grey Plover *Pluvialis squatarola*.

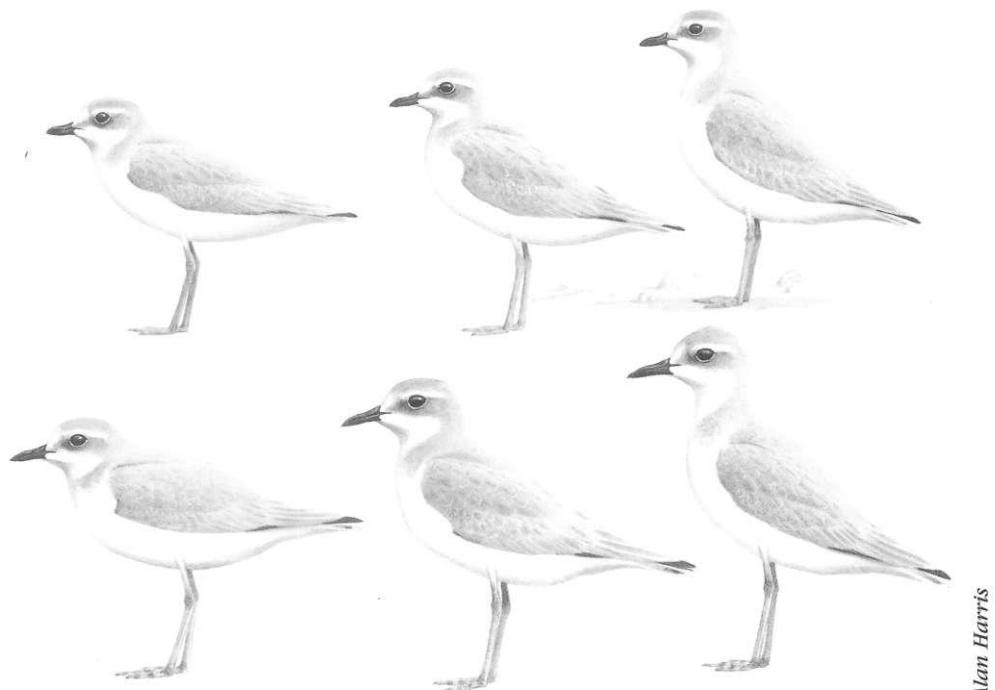
On Lesser, the head is smaller and more rounded, and the eye is situated closer to the bill. The legs can look long, but the impression is that there is more 'weight' in front of the legs; the area behind the legs looks less attenuated and much less 'massive' than that in front.

The difference in general impression between Greater and Lesser Sand Plovers can be compared with that between Kentish Plover *C. alexandrinus* and Great Ringed Plover, the latter being the better-proportioned, more horizontal and 'better-balanced' of the two when relaxed.

#### Feeding behaviour

From studies in Kenya, Madagascar and Mauritius, Hockey (1993) suggested possible differences in the feeding behaviour of the two species. In brief, he concluded that Lesser Sand Plovers move shorter distances between pauses to search for prey than do Greater Sand Plovers, and that the latter move greater distances to capture prey and make longer pauses.

Hirschfeld & Stawarczyk (1993) also studied foraging behaviour in the Persian Gulf, but, rather than counting steps, looked at feeding rates (pecks per minute) and effi-



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**Fig. 3.** Typical postures of Lesser Sand Plover *Charadrius mongolus* (upper three) and Greater Sand Plover *C. leschenaultii* (lower three).

ciency (successful pecks per minute) and type of food. They distinguished between the races *columbinus* and *crassirostris* of Greater, and compared these with an unknown subspecies of Lesser (probably *pamirensis*) in two kinds of micro-habitat (sand and wet mud). They found that Lesser Sand Plovers did not feed on crabs at all, preferring worms, whereas, for *columbinus* and *crassirostris* respectively, 2% and 18% of successful pecks were at crabs; moreover, *columbinus* approached Lesser Sand Plover in feeding rate and feeding efficiency, but both differed greatly from *crassirostris*, whose feeding rate and success were remarkably low.

It is important to bear in mind that these studies were made on rather small sample sizes, and in a specific (tropical) environment. How these birds would forage when displaced from their normal environment and forced to feed on other prey is not known.

#### Calls

The call of Lesser Sand Plover has been described as a short, hard 'kit-kit' or 'kruit-

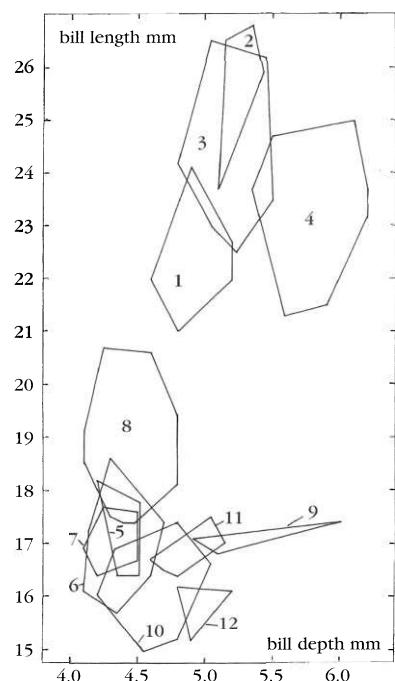
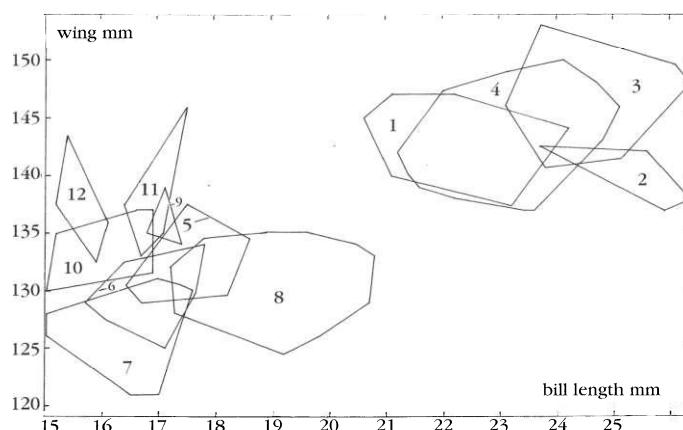
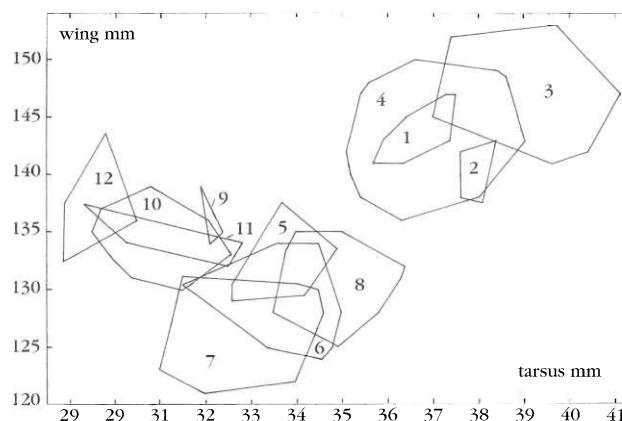
'kruit', like that of Sanderling *Calidris alba*, and that of Greater as a softer and longer, churring 'prrirrt'. Observations in the Persian Gulf (EH), however, reveal considerable overlap in calls between the two species. Greater often utters short, hard calls, while Lesser, especially when chasing other birds, can give softer, churring calls. Softer calls (transcribed as 'drerrüid') were described in detail by Gebauer & Nadler (1992) for breeding Lesser Sand Plovers. We suggest that voice is of virtually no use when identifying vagrants.

No subspecific differences in voice are known.

#### Structure

From all available measurements, scattergrams were produced to show, for each species, the ratios of wing length to tarsus length, wing length to bill length, and bill length to bill depth (figs. 4-6, on page 168).

Millington (1988) proposed a formula involving tarsus length (from knee to foot) divided by bill length (from tip to where feathering meets culmen) for identifying the two species from photographs, the ratios



**Fig. 4.** Top (left), scattergram of wing length to tarsus length of Greater *Charadrius leschenaultii* and Lesser Sand Plovers *C. mongolus*. Except where stated, samples are of adults from breeding grounds. Greater (individual plots 1-4): (1) 10 breeders from Middle East, (2) 4 from Transcaucasia, (3) 26 from Transcaspia east to Syr Dar'ya, (4) 6 from E Kazakhstan and Kyrgyzstan eastwards, as well as 85 winter birds from Indonesia. Lesser (plots 5-12): (5-8) 'atrichrons group', (5) 7 from E Alai Mts and Tien Shan, (6) 28 from Pamir, W Kun Lun, Ladakh and Lahul, (7) 14 from S Tibet (including data from Stresemann 1940), (8) 4 from Qinghai Hu (Kukunor) and upper Xining He, as well as 49 adult winter birds from Greater Sundas; (9-12) 'mongolus group', (9) 3 from Lake Baikal area, (10) 21 breeders and adult migrants from Amurland and Ussuriland, (11) 6 from Chukotskiy, Koryakland and N Kamchatka region, (12) 5 from Commander Is.

**Fig. 5.** Centre (above), scattergram of wing length to bill length of Greater *Charadrius leschenaultii* and Lesser Sand Plovers *C. mongolus*. Details as for fig. 4, except: (2) 5 breeders, not 4; (3) 34 breeders, not 26; (4) includes 73 winterers, not 85; (7) 16 breeders, not 14; (8) includes 51 winter adults, not 49; (11) 7 breeders, not 6.

**Fig. 6.** Bottom (left), scattergram of bill length to bill depth of Greater *Charadrius leschenaultii* and Lesser Sand Plovers *C. mongolus*. Details as for fig. 4, except: (2) 5 breeders, not 4; (4) includes 38 winter adults, not 85; (6) 25 breeders, not 28; (7) 7 breeders, not 14; (8) includes 54 winter adults, not 49; (10) 20 breeders and migrants, not 21.

**Table 2.** Average tarsus/bill-length ratios of Greater *Charadrius leschenaultii* and Lesser Sand Plovers *C. mongolus*.

	Tarsus/bill	Sample	Range	S.D.
<b>GREATER</b>				
<i>crassirostris</i>	1.55	75	1.43-1.66	0.071
<i>leschenaultii</i>	1.58	119	1.47-1.72	0.076
<i>columbinus</i>	1.66	49	1.54-1.78	0.085
<b>LESSER</b>				
<i>schaeferi</i>	1.86	66	1.70-2.03	0.105
<i>stegmanni</i>	1.87	39	1.77-2.11	0.109
<i>atrifrons</i>	1.88	14	1.81-1.98	0.081
<i>mongolus</i>	1.92	47	1.82-2.09	0.092
<i>pamirensis</i>	1.98	40	1.88-2.16	0.096

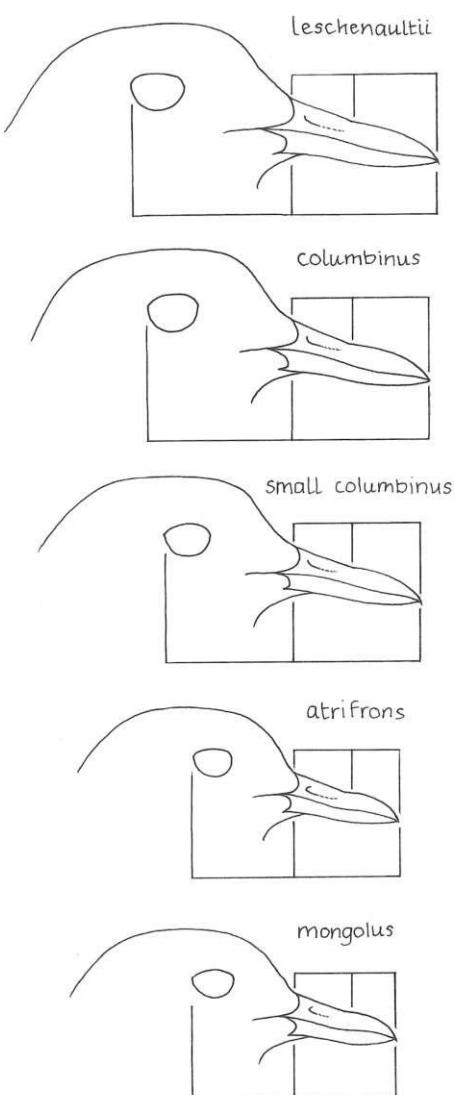
being 1.59:1 for Greater and 1.85-1.99:1 for Lesser. Although this formula seems to be fairly accurate, the ratio is difficult to determine, as the angle from which the photograph is taken needs to be considered. Average tarsus/bill-length ratios calculated from skins are given in table 2.

Although the tibia is often more exposed on Greater Sand Plover, this character is subject to much variation depending on air temperature and the individual bird's posture (belly feathers being fluffed out in colder weather).

#### Bare parts

LEGS. Leg colour is usually greyish-black or black on Lesser Sand Plover and yellow-green or greenish-grey on Greater. Some variation does exist, especially among young individuals, Lesser sometimes showing greenish-grey legs and Greater not infrequently having greyer legs. The toe joints of Lesser are concolorous with the rest of the legs, while Greater often (but not always) has darker toe joints. Beware, however, that the legs are often soiled from mud, algae and sand, and they can also become sun- or salt-bleached (as is often the case with, for example, Middle Eastern Kentish Plovers: Hirschfeld & Stawarczyk 1994).

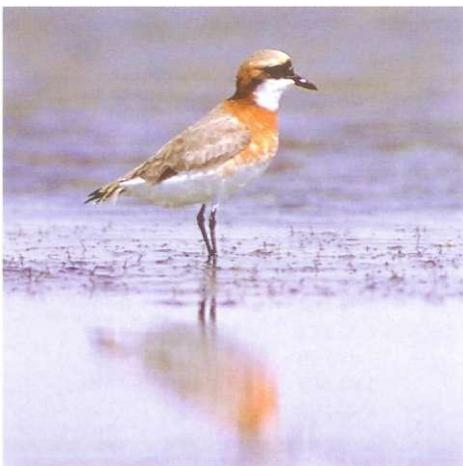
BILL. See fig. 7. Both species have a black bill, that of Greater Sand Plover (of the two eastern subspecies) being the heavier and



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**Fig. 7.** Bill and head proportions of Greater Sand Plover *Charadrius leschenaultii* (top three) and Lesser Sand Plover *C. mongolus* (bottom two).

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97. Lesser Sand Plover *Charadrius mongolus* in summer plumage, Oman, May 1991. This bird shows characters of the 'atrifrons' group, with a black forehead, and with orange rather than rufous-tinged breast-band which extends to the flanks.



98. Breeding-plumaged female Greater Sand Plover *Charadrius leschenaultii*, Turkey, March 1987. The pointed bill lacks the bulbous tip of Lesser Sand Plover *C. mongolus*. The dusty terracotta colour of this bird shows that it belongs to the subspecies *columbinus*. The bulkiness gives an impression of a Grey Plover *Pluvialis squatarola*.

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99. Breeding-plumaged male Greater Sand Plover *Charadrius leschenaultii* of subspecies *columbinus*, Israel, May 1987. The bill is pointed, lacking the blunt tip of Lesser Sand Plover *C. mongolus* (cf. plate 100). The faintly suggested pale rusty fringes to some of the larger scapulars and the ill-defined facial mask are typical of subspecies *columbinus*. The bill can be much shorter than on this fully grown individual.

longer. On Greater, the mandibles gently taper to form a long point (plates 98 & 107), whereas, on Lesser, they taper more steeply and produce a blunt tip (plates 100 & 108). A major pitfall is race *columbinus* of Greater (plate 99), which has a short and sometimes 'weak' bill, although it is never as blunt-

ended as on Lesser Sand Plover. Photographs need to be extremely sharp and taken at close range for this character to be determined accurately.

The bill shape of Lesser Sand Plover varies. All subspecies within the western 'atrifrons' group have a more slender and

pointed bill than the other subspecies, and in this respect their bill approaches that of race *columbinus* of Greater.

A character widely described as useful in the field is bill length in relation to the eye. Birds with bill length equal to or shorter than the distance between the base of bill and the rear of the eye are considered to be Lesser Sand Plovers, while those with a bill longer than this distance are thought to be Greater Sand Plovers. In our opinion, this rule may not always be reliable, as *columbinus* Greaters can have a very short bill (*approaching* average length of Lesser). Nevertheless, those with the longer bill are always Greaters, but shorter-billed individuals can be either Lesser or, albeit rarely, *columbinus* Greater.

In relation to total bill length, the nail (the 'hump' at the tip) is longer on Greater and shorter on Lesser, which contributes strongly to the latter's blunt-billed impression (fig. 7); this is conclusive on hand-held birds (plates 107 & 108). On Greater, the distance from beginning of nail to bill point is longer than the visible bill between forehead and nail; it is shorter on Lesser. Because of Greater's elongated bill tip, its nail may appear shorter than it actually is until measured (from photograph or in the hand). Measurements of 52 Lesser Sand Plovers in Bahrain and the UAE showed that the nail varied between 6.1 mm and 9.1 mm, while two Greaters from the UAE had a nail of 10.4 mm and 11.2 mm

(Hirschfeld *et al.* pers. obs.). The bill nail of 42 nominate Lessers in the Zoological Museum of Copenhagen was 7.5–9.9 mm (all below 8 mm were juveniles) and that of 91 Greaters was between 10.5 mm and 13.5 mm.

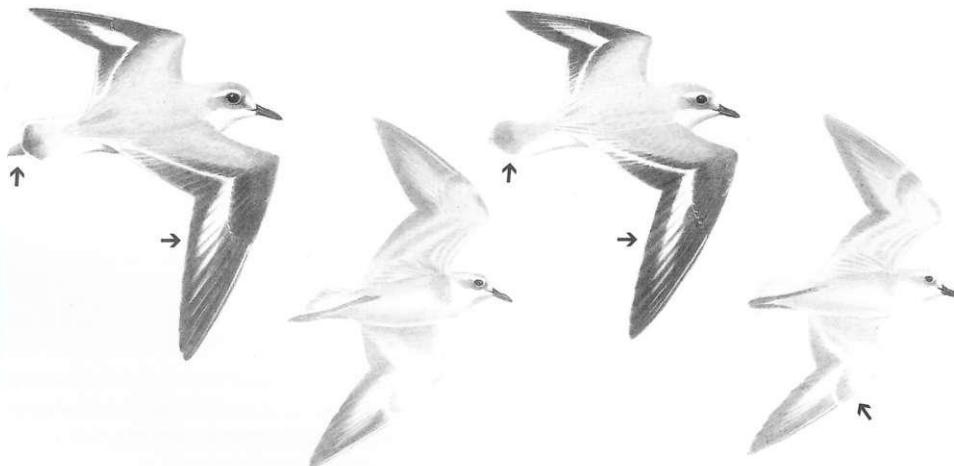
On skins and with birds in the hand, actual bill length is a valid character. Of 283 Greaters, only 19 (all *columbinus*) had a bill length below 22 mm, with just two of those 20.7 mm or less. Of 317 Lessers, only 39 (virtually all *schaeferi*) had a bill of 19 mm or over, no more than four being 20 mm or more.

#### Flight pattern

In flight, the feet always project beyond the tail on Greater Sand Plover, while they are invisible or just barely visible on Lesser, but this can be difficult to assess subjectively.

Shirihai *et al.* (1996) highlighted a difference in the wing-bars of the two species. On the primaries, the rear edge of Greater's wing-bar bulges, while it is straight and of even width on Lesser (plate 102; fig. 8). Although very difficult to observe in the field, this can be seen on photos, or in video recordings when wing movements are frozen.

Shirihai *et al.* (1996) also described some important characters of the tail, although with some overlap between the species. Greater's tail has a dark subterminal bar which, in the field, contrasts well with the



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**Fig. 8.** Differences in flight between Greater Sand Plover *Charadrius leschenaultii* (two at left) and Lesser Sand Plover *C. mongolus* (two at right). Note Greater Sand Plover's 'bulging' primary-bar, toe projection beyond tail, and tail pattern; and Lesser Sand Plover's dusky under primary coverts.

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100. Adult Lesser Sand Plover *Charadrius mongolus* of the 'atrifrons' group, Oman, September 1995. This bird shows a 'jizz' recalling Kentish Plover *C. alexandrinus*. The bill is blunt, with the tip not so tapered as on adult *columbinus* Greater *C. leschenaultii* (cf. plates 98 & 99).

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101. Juvenile Greater Sand Plover *Charadrius leschenaultii*, probably of eastern subspecies *crassirostris* or *leschenaultii*, Oman, September 1995. Large eye, squarish head and general bulkiness identify this bird as a Greater Sand Plover. The bill is rather short compared with that of adult Greater, but is thick-based and pointed; the fringes to the coverts are typical of fresh juveniles.

paler base and (in fresh plumage) a white terminal band; the tail of Lesser looks more evenly sandy-brown, and the slightly darker (narrower and more ill-defined) subterminal bar is generally obscure or virtually impossible to see in the field (fig. 8). The tail may often be important when identifying single

vagrants. Greater also has more white on the tail sides than Lesser, but this, too, is a subjective character difficult to judge on a lone bird.

Both species exhibit a 'comma' mark on the carpal joint of the underwing. It is grey and wider on Lesser (fig. 8), while Greater



Hadram Shribat

102. Adult female Greater Sand Plover *Charadrius leschenaultii* of subspecies *columbinus*, Israel, March 1991. The pronounced widening of the white wing-bar on the inner primaries is visible.

has a paler, narrower marking. If a flying bird shows a strong 'comma' mark, it is likely to be a Lesser Sand Plover.

#### Moult

**BODY.** Timing of body moult can be useful when identifying an adult sand plover in summer. Races *leschenaultii* and *crassirostris* of Greater Sand Plover have a later post-breeding body moult than *columbinus* and have usually acquired non-breeding plumage by mid August. Race *columbinus*, with a much earlier post-breeding moult, gains non-breeding plumage as early as July (Cramp & Simmons 1983): this is due to its earlier breeding, with juveniles appearing in, for example, the Persian Gulf by mid June.

In spring, *columbinus* has usually acquired breeding plumage by February, while *crassirostris* and *leschenaultii* moult in February–March/April (Cramp & Simmons 1983). Beware that second-years may moult into summer plumage later than adults.

Unlike Greater Sand Plover, Lesser Sand Plover does not start its post-breeding moult (apart from white specks which appear on the forehead soon after nesting) until arriving in winter quarters; head and body are moulted from late August onwards. The pre-breeding moult is also later than Greater's, head and body moult starting from early April to early May.

**WING.** Wing moult of races *leschenaultii* and *crassirostris* of Greater starts in mid July, is then suspended, and is completed by November–December (sometimes January); race *columbinus* does not suspend its moult,

which starts in late June to mid July and is completed by September. Lesser Sand Plover begins wing moult in August, and has completed it by December or, occasionally, not until February (Cramp & Simmons 1983).

When identifying a vagrant sand plover in Europe, therefore, bear in mind the following:

- A small *mongolus/columbinus*-type in breeding plumage appearing in July or early August can be strongly suspected of being a Lesser Sand Plover, and is rather unlikely to be a *columbinus* Greater.
- A small individual in full summer plumage in February or March is likely to be *columbinus*.
- A small bird in active wing moult after September is likely to be a Lesser, and not a *columbinus* Greater.
- A vagrant in complete or near-complete summer plumage after mid August is likely to be a Lesser.
- A juvenile in Western Europe in June or early July is almost certainly a *columbinus* Greater.

#### Breeding plumage

Both species have a fairly bright breeding plumage, with black head markings and a more or less orange breast (fig. 9, on page 175). All subspecies exhibit sexual dimorphism. In general, females have less black on the head (although many show quite a lot of black), this being replaced by greyish-brown or by rufous-cinnamon mottling. Females (and most males) of Greater Sand Plover do not show a black border to the breast-band.

Female Lessers lack or have restricted rufous-cinnamon on forecrown, lower nape and upper mantle, and their breast-band is usually narrower, especially in the centre.

### *Lesser Sand Plover*

Lesser Sand Plovers can be divided into two subspecies groups: '*atirifrons* group' (races *atirifrons*, *pamirensis* and *schaeferi*), tradi-

tionally characterised by jet-black forehead in breeding plumage; and '*mongolus* group' (*mongolus* and *stegmanni*) with white on forehead, in which respect they resemble Greater Sand Plover. New studies have shown, however, that as many as 15-20% of breeding Lesser Sand Plovers on the Chukotskiy Peninsula in Siberia (believed to belong to subspecies *stegmanni*) have a jet-black

**Table 3.** Subspecific variation of breeding-plumaged male Lesser Sand Plovers *Charadrius mongolus*. Note that *schaeferi* is somewhat intermediate, closest to *mongolus*; *pamirensis* is very similar to *atirifrons* and not readily identifiable except by distribution and size. On females, black facial markings often reduced (mottled lines) or partly absent, on ear-coverts brown and less extensive (in '*atirifrons* group' especially, females can lack black altogether).

	'MONGOLUS GROUP'		'ATRIFRONS GROUP'		
	<i>mongolus</i>	<i>stegmanni</i>	<i>atirifrons</i>	<i>schaeferi</i>	<i>pamirensis</i>
<b>Bill</b>	Appears relatively rather strong and short, with rather well-developed nail and gonys	Shortest and stubbiest of all races, with well-developed nail and gonys	Short, narrow, with less developed nail and gonys	Very fine and slender, as <i>atirifrons</i> (but slightly longer)	Very similar to <i>atirifrons</i>
<b>Face mask</b>	Most extensive white forehead (often divided by narrow black line) of all races; black of mask extends well onto crown and above eye; white line from above eye to above ear-coverts; narrow black line between white forehead and cinnamon crown	Extensive black mask with small white patches, therefore with wider darker lines in between and in surrounding areas	White on forehead much reduced (as small dots/flecking in front of eye) or totally lacking; black of forehead usually extends over smaller area	Pattern of mask as for <i>atirifrons</i>	Forehead sometimes with more white than <i>atirifrons</i> ; some show small white spots in front of eye
<b>Head and breast-band</b>	The rufous is dark, intense and rather extensive	Breast-band very broad and tinged chestnut-rufous, extends to flanks	Rufous of head pale (more orange than chestnut); breast-band tinged orange rather than chestnut (but still deeply pigmented) and extends to flanks	Breast-band reduced in area, but mainly orange and paler than <i>atirifrons</i>	Breast-band pale rufous-cinnamon, narrow and ill-defined
<b>Border to breast-band</b>	Narrow black line	Black line variable, but generally appears strong and large	Virtually no indication of black line bordering upper breast	Absent or virtually absent	As <i>atirifrons</i>



Alan Harris

**Fig. 9.** Summer plumages of Lesser Sand Plover *Charadrius mongolus* (upper six) and Greater Sand Plover *C. leschenaultii* (lower four).

forehead, which should be the norm for members of the 'atrifrons group' (Anders Wirdheim verbally; plate 106). It is also important to bear in mind that 'atrifrons' Lessers acquire white patches on the forehead very soon after leaving the breeding grounds, rendering subspecific identification in the field of a summer or autumn vagrant unreliable. (Biometric differences exist, see below, but placing winter-plumaged birds in subspecies groups can be controversial, even

if they are trapped: see e.g. Hirschfeld *et al.* 1996.)

As the sexes are similar to each other in breeding plumage (though females often have ear-coverts that are browner and more mottled, less uniform black), racial identification in spring and summer may appear less complicated than is the case with Greater Sand Plover, which shows greater sexual dimorphism. In fact, this is not so, because the populations of Lesser show much more

variation than these two plumage types might suggest; intermediates with larger or smaller white patches on a black forehead are frequent.

The following characters, derived from our own skin studies, and from raw data provided by CSR for *BWP* and for Shirihai (1996), indicate subspecific identity of summer-plumaged Lesser Sand Plovers in the hand (table 3).

Only birds from southern Tibet and northern Sikkim (race *atirifrons*) invariably have a uniform black forehead; they also have rather dark brown-grey upperparts and a dark and saturated broad rufous-orange breast-band. Farther to the northwest and northeast, birds from Lahul, Ladakh and Kashmir (here considered inseparable from *atirifrons*), as well as those of the upper Huang He in southeast Qinghai, China (*schaeferi*), average slightly paler grey-brown and are generally somewhat paler and less extensively rufous on the breast. The forehead is usually uniform black, but a few individuals show a small white spot at each side of the forehead.

Those from the Pamir, western Kun Lun and Tien Shan mountains (*pamirensis*), along with populations of northeast Qinghai and

neighbouring Gansu (here considered inseparable from *schaeferi*), are paler still, with drab grey rather than brownish mantle, scapulars and tertials, and narrower and paler rufous-cinnamon breast-band which may be less sharply defined at the rear. Small white forehead patches are more often present, and a few migrants from southern China and western Indonesia, supposed to originate from Qinghai or perhaps from southern Mongolia (possibly *schaeferi*), have white patches almost as large as on some Greater Sand Plovers, with rather narrow black surrounding lines.

The question of breeding in Mongolia is unresolved. Observations by Mauersberger (1975) and Kurochkin & Mikhailov (1994) may refer to migrants; others are thought to involve misidentified Greater Sand Plovers (Nadler & Königstedt 1986), which in this region sometimes show much black on the forehead. According to Baltdelger (in Tourenq *et al.* 1996), Lesser Sand Plover breeds, albeit rarely, in northeast Mongolia between 112° and 116°E.

Populations from Transbaikalia and the Amur area (nominate *mongolus*) are the palest of all. The white forehead patches are prominent, and the plumage is rather close

**Table 4.** Subspecific variation of breeding-plumaged male Greater Sand Plovers *Charadrius leschenaultii*. Note that nominate *leschenaultii* is somewhat smaller than *crassirostris*, approaching *columbinus* in size. On females, black facial markings are reduced or absent.

	<i>leschenaultii</i>	<i>crassirostris</i>	<i>columbinus</i>
<b>Bill</b>	Strong, with curved nail and obvious, angled gonys	As nominate, but on average somewhat longer and thinner	Smallest of the races, short and slender
<b>Upperparts</b>	Usually 'clean' grey-brown, often lacking cinnamon tinge, and thus similar to Lesser Sand Plover, but may show narrow rufous margins	Paler grey-brown, usually lacking rufous-cinnamon tinge, but may show narrow rufous feather margins	Extensive and wide rufous-cinnamon fringes, also on female
<b>Face mask</b>	Variable, but occasionally fully black	Wider and complete, with white forehead patch small or absent	Ill-defined pattern, with extensive white area causing black of forehead to be broken
<b>Breast-band</b>	Narrow at centre (see fig. 9) and deeper rufous, hardly extending to lower breast or onto flanks; also more sharply demarcated	Broader, less sharply demarcated and generally paler, but with narrow centre (see fig. 9), and rufous often extending obscurely to flanks	Wide and rufous, more of a blotch on the breast and extending well onto flanks
<b>Border to breast-band</b>	Normally lacking	Sometimes present as thin black line; often absent	Absent

to that of nominate Greater Sand Plovers breeding in the same general area. Farther to the northeast, approaching the Pacific shores, the birds become gradually darker again, although the white forehead patches are still obvious (but see remarks above on Chukotskiy breeders).

The darkest Lesser Sand Plovers occur on the Commander Islands, in the Kamchatka region and in the northeast Magadan region, including Chukotskiy (*stegmanni*). They have darker and browner upperparts, less grey than on Transbaikalia birds, the nape and breast-band are darker, deeper tawny-rufous or russet and less tawny-ochre, and the breast-band is very broad. The white forehead patches are rather small and surrounded by bold black lines, and the rufous breast-band and white chin are often separated by a black bar (usually absent on Transbaikalia-Amur populations, and only occasionally present on those from farther southwest in central Asia).

### *Greater Sand Plover*

Subspecific variation is summarised in table 4.

Little can be added to the information given in *BWP* (vol. 3). The breeding plumage of birds from the Middle East (*columbinus*) is generally rather pale, but the rufous is extensive. On the male, the black areas on the face are usually reduced and narrow and the black on the ear-coverts is sometimes restricted and partly replaced by rufous-cinnamon. On the female, the dark lines are often absent or indicated merely by mottled brown or greyish feathering. In fresh plumage, mantle, scapulars and tertials of both sexes often show extensive pale rufous-cinnamon feather fringes, and the rufous-cinnamon of the broad breast-band extends over the flanks, gradually becoming more mixed with white towards the rear. When worn, the upperparts are more uniformly pale sandy-grey, the breast-band is sometimes narrower and more sharply defined and the sides of the breast are often partly suffused brown-grey.

In populations from eastern Kazakhstan and Kyrgyzstan eastwards (nominate *leschenaultii*), the black areas on the face of the breeding male are broader and more distinct, the black stripe over the ear is prominent, and the white patches on the forehead

are slightly to considerably smaller. The female often shows similar dark areas, though mottled black, brown or grey. The upperparts are purer brown-grey (less extensively tinged rufous, but much individual variation) when fresh, and paler drab grey (less pale cinnamon or sandy) when worn. The breast-band is slightly deeper rufous, much narrower, and more sharply defined at the rear, the rufous not extending towards the flanks, though the latter may sometimes show a slight rufous tinge when the plumage is fresh.

The breeding plumage of birds from Transcaucasia (probably *crassirostris*, but see below) and Transcaspia (definite *crassirostris*) is about as dark as that of eastern populations, although the breast-band is broader and less sharply defined at the rear. In this, these birds resemble Middle Eastern *columbinus*, although the cinnamon averages deeper in colour.

In all populations, however, the general colour is strongly influenced by bleaching and abrasion, becoming gradually paler after the spring moult, with the breast-band becoming gradually narrower and more distinct (unless heavily worn). Identification of race based on plumage characters alone is not advocated; measurements are more trustworthy.

### *Non-breeding plumage*

In plumages other than adult breeding, specific or subspecific identification cannot be made on plumage alone, but should be based on structure (including measurements), 'jizz', and patterns of upperwing and uppertail (see above and below). Non-breeding plumages are shown in fig. 10.

**ADULTS.** On both species, the upperpart feathers (including most of wing-coverts, but mainly median and lesser, as well as tertials) are predominantly dull grey-brown, indistinctly and finely tipped/edged lighter. The head pattern is duller compared with breeding plumage, with a broad white forehead and a variable whitish supercilium. Largely white below, with fairly large brown-grey breast-side patches which can join in centre of breast.

**IMMATURES/FIRST-SUMMERS.** As adults of the respective species/subspecies, but spring/breeding plumage may be less

advanced and less complete. Primaries are relatively more worn and bleached.

**JUVENILES.** Reminiscent of adult non-breeding, but upperparts browner and extensively fringed buff, especially on mantle, scapulars and median/lesser coverts; chest area more strongly tinged sandy or buff. Note that assessment of structure, size and shape needs caution, as young birds, not fully grown, can appear atypical.

### Biometrics and geographical grouping

This section aims to justify the current subspecific groupings of the two species, using biometric data from about 300 sand plovers of each species collected from a wide variety of locations. The data are contained in tables 5, 6 & 7.

For all birds examined, wing length, tarsus length, bill length (from feathering at forehead) and bill depth (at the level of the arched nail near tip) were measured. All data in the tables refer to adults unless otherwise noted. Juvenile wings, on average about 3 mm shorter than adult, are excluded from the analysis of geographical variation; in other measurements, juveniles from age of about three months (for tarsus, probably even earlier) are similar to adults. Sexes are virtually alike (females on average often slightly larger than males; see *BWP* 3), so the data on both sexes are combined.

An explanation of the nomenclature used to name subspecies is given in Appendix 1 (page 188).

#### Greater Sand Plover (table 5)

Specimens of Greater Sand Plover from the breeding grounds (see fig. 1, on page 164) were split into four geographical groups.

**1. Middle East group.** Birds from inland Levant, Syria and western Iran, taken March-June. None of the skin labels noted that the individual had been incubating or caring for young, but the breeding plumage of all was characteristic of *columbinus* (the race supposed to breed in the region) and differed from that of birds from the Caspian Sea and farther east. A number of specimens, taken by J. Aharoni, had a collecting date, but only 'Syrian Desert' as locality; according to Aharoni (1931), the birds are 'commonly

encountered in the Syrian Desert in the breeding season and undoubtedly breed'. The species is now well known to breed in Syria (e.g. Bottema 1987; Baumgart *et al.* 1995), though breeding sites and densities may vary between years, depending on local rains. Birds from Turkey were not examined; these, too, are usually considered to be *columbinus*, and this is supported by plumage characters, but note that specimens from Transcaucasia, close to the Turkish border and sometimes also referred to as *columbinus* (e.g. in *BWP* 3), differ in measurements.

**2. Transcaucasian group.** Specimens from Armenia (Sardarabad steppe near Yerevan) and eastern Azerbaijan (Mugan steppe, Baku area), taken in second week of June. This sample was small and consisted only of males.

**3. Transcaspian group.** Specimens from western Transcasplia, March-June. The majority were from near the shores of the Caspian, with a minority from farther east in the Karakum and Kyzylkum deserts. Those taken in March (Gasan-Kuli and Mangyshlak Peninsula, on or near the shore) were probably still on migration, but are included in the breeding sample as they did not differ in plumage or measurements from birds obtained during late April to June in the same area or along the Kara-Bogaz Gol and in the Karakum and Kyzylkum deserts.

**4. Eastern group.** The few April-July specimens from farther east (eastern Kazakhstan, Issyk-Kul' in eastern Kyrgyzstan, northern Xinjiang, Tuva and Mongolia) were lumped together, and even then formed a rather small sample. Data from a much larger sample of wintering birds from Indonesia were therefore added to the Eastern group in the analysis (the Indonesian birds are undoubtedly of eastern origin, and this is supported by the close similarity in measurements between central Asian and Indonesian specimens).

It is quite likely that the breeding grounds of the Transcasplian and Eastern groups as recognised here meet each other, and that the artificial geographical boundary constructed between these groups either is nonexistent or lies somewhat farther to the west or east. The boundary is here taken to be between about 66°E and 75°E, as three specimens from the Kyzylkum desert at about

**Table 5.** Measurements in mm of Greater Sand Plover *Charadrius leschenaultii*. Figures show average (S.D.; sample) and range.

	WING	TARSUS	BILL LENGTH	BILL DEPTH NEAR TIP
<b>Breeders</b>				
(1)	143.1 (2.64; 13) 137-147 (mostly 141-145)	36.8 (0.84; 13) 35.7-37.9	22.5 (1.08; 13) 21.1-24.1	4.92 (0.234; 13) 4.6-5.2
(2)	139.4 (2.63; 5) 137-142	38.0 (0.45; 4) 37.6-38.6	25.7 (1.22; 5) 24.7-26.9	5.24 (0.134; 5) 5.1-5.4
(3)	146.6 (3.42; 33) 140-155	38.8 (1.49; 31) 36.2-42.1 (mostly 38-41)	24.8 (1.10; 31) 23.0-27.0	5.26 (0.282; 32) 4.5-6.0 (mostly 4.6-5.2)
(4)	146.2 (2.60; 6) 142-150	37.1 (0.96; 5) 36.2-38.1	23.6 (1.80; 6) 21.6-25.4	5.65 (0.228; 6) 5.4-6.0
<b>Migrants and winter birds</b>				
(5)	143.5 (3.59; 12) 140-150	36.9 (1.34; 12) 34.5-38.5	21.7 (1.21; 11) 20.1-22.7	5.01 (0.232; 10) 4.6-5.3
(6)	142.8 (4.51; 28) 134-151	36.5 (1.03; 21) 34.1-38.3	22.9 (1.03; 27) 20.8-24.3	5.08 (0.187; 27) 4.8-5.6
(7)	140.0 (4.84; 12) 135-152	36.9 (1.70; 12) 33.5-39.8	23.0 (1.21; 12) 21.1-25.1	5.18 (0.174; 12) 4.9-5.5
(8)	146.4 (4.03; 11) 138-152	38.3 (1.07; 11) 36.7-40.0	24.5 (1.58; 11) 21.9-27.4	5.44 (0.330; 11) 4.9-6.0
(9)	146.2 (3.64; 21) 142-153	37.3 (1.41; 21) 35.5-40.2	23.8 (1.11; 21) 22.2-25.4	5.96 (0.296; 21) 5.5-6.4
(10)	146.6 (3.87; 21) 140-153	38.0 (1.35; 21) 36.1-40.0	24.7 (1.06; 21) 22.8-26.5	5.76 (0.220; 21) 5.5-6.3
(11) (a)	143.0 (3.67; 56) 136-151	36.8 (1.32; 119) 34.2-39.6	23.3 (1.07; 125) 21.0-26.5	5.85 (0.269; 40) 5.4-6.2
(11) (b)	140.2 (3.29; 50) 133-147			

### Origins

- (1) W Iran, Syria and inland Levant, Mar-June = *columbinus*.
- (2) Armenia and E Azerbaijan (Transcaucasia) = *crassirostris*?
- (3) W Transcaspia from E shore of Caspian (Mangyshlak Peninsula, Kara-Bogaz Gol, Gasan-Kuli) east through Karakum and Kyzylkum deserts to central Syr Darya (Kzyl-Orda area) = *crassirostris*.
- (4) E Kazakhstan, Issyk-Kul' (Kyrgyzstan), Xinjiang (W China), Tuva Republic and Mongolia = *leschenaultii*.
- (5) Egypt and coastal Levant (26-33°N), July-Feb = *columbinus*.
- (6) coasts of central Red Sea (19-22°N: Jeddah in Saudi Arabia, Port Sudan and Suakin in Sudan), June-Mar = *columbinus*.
- (7) coastal Eritrea, Djibouti, N Somalia and Yemen (10-16°N), all year = *columbinus* + *crassirostris* mix.
- (8) Persian Gulf and Oman (20-30°N), Aug-Apr = *columbinus* + *crassirostris* + *leschenaultii* mix.
- (9) E & S Africa, Comoros, Aldabra and Madagascar (2°N-30°S), Sept-Apr = *leschenaultii*.
- (10) Karachi (S Pakistan), July-May = *leschenaultii*.
- (11) Indonesia, Aug-May, wing given separately for adult (a) and juvenile (b), other data combined (ages similar) = *leschenaultii*.

66°E (near Kzyl-Orda) are similar to Transcaspian birds from farther west, and three from easternmost Kazakhstan and Issyk-Kul' at about 75°E appear to belong to the Eastern group; according to fig. 1, the species is widespread in the intervening area, but none was examined from there.

On the basis of measurements, the four geographical groups clearly form at least three subspecies.

### Subspecies recognised in Greater Sand Plover

1. *columbinus*. Small, slender-billed birds of the Middle East group (1 in figs. 4-6, on page 168).

2. *leschenaultii*. Equally small birds from the Eastern group (4 in figs. 4-6), differing from Middle East birds in much thicker bill.

3. *crassirostris*. Birds from the Transcaspian group (3 in figs. 4-6), with tarsus (mainly over 38 mm) and bill (mainly over 24 mm) clearly longer than previous two races (in the other groups, chiefly below 38 mm and 24 mm, respectively), but with bill depth intermediate between groups 1 and 4; bill-length difference is also supported by data of Chelstov-Bebutov (1976), means 24.2 mm ( $n = 73$ ) for Transcaspian birds and 21.7 mm ( $n = 20$ ) for Eastern birds. Transcaucasian specimens (sample 2 in figs. 4-6) are more problematic, being close to Transcaspian

Hanne & Jens Eriksen



103. Adult summer Greater Sand Plover *Charadrius leschenaultii*, Oman, April 1994. Probably of subspecies *leschenaultii*, as indicated by the sharply demarcated breast-band. This bird looks rather slim, probably owing to the heat.

Hanne & Jens Eriksen



104. Adult Lesser Sand Plover *Charadrius mongolus* moulting into winter plumage, Oman, September 1995. The bill of this bird is much blunter than that of *columbinus* Greater Sand Plover *C. leschenaultii*. A pale individual such as this can resemble Kentish Plover *C. alexandrinus*. Winter-plumaged sand plovers can be difficult to age in the field (and in the hand), but the remnants of orange shown by this individual reveal it as an adult.

birds in plumage and measurements, but with wing shorter and bill averaging even longer; the sample is too small to decide whether they form a separate race, and we combine them with *crassirostris* until further data become available.

#### *Lesser Sand Plover (tables 6 & 7)*

On the basis of measurements, the breeding populations are clearly separable into two groups: the 'atrifrons' subspecies group' and the 'mongolus' subspecies group', the former having rather short wings and less deep bill, and relatively longer tarsus and bill lengths.

Jan Uneson



**105.** Breeding Lesser Sand Plover *Charadrius mongolus*, Chukotskiy Peninsula, Siberia, June 1992. Within range of subspecies *stegmanni*, showing an extensively black forehead. The narrow black upper border to the breast-band is typical.

Nick Dymond



**106.** Hand-held immature Greater Sand Plover *Charadrius leschenaultii* of subspecies *leschenaultii* or *crassirostris*. Although there is a tendency towards bulbousness near the tip of the bill (more obvious on the two eastern subspecies), this is not so pronounced as on Lesser Sand Plover *C. mongolus*.

A scattergram of wing length to tarsus length (especially) or bill length to bill depth clearly separates most individuals of these groups (see figs. 4-6, on page 168), which may form two incipient species.

**1. The 'atrifrons' group.** Measurements of the various breeding populations overlap greatly, but birds from southern Tibet (2 in table 6) tend to have short wings and those from eastern Qinghai (1 in table 6) have a long bill. A large winter sample from western Indonesia (13 in table 6; see also figs. 2 & 4) is even longer-billed than eastern Qinghai

birds; their breeding origin is supposed to be in eastern Qinghai, or perhaps even in southern Mongolia (see Mauersberger 1975; Nadler & Königstedt 1986), and this is supported by the fact that northeast Qinghai birds and those from Indonesia are among the palest individuals of the '*atrifrons*' group examined. The bill length of these long- and slender-billed birds is usually over 17.5 mm, that of all other populations of Lesser Sand Plover being usually under 17.5 mm. The number of specimens wrongly identified by using a bill length of 17.5 mm as the dividing character is small (see BWP 3: 170), and recognition of at least two different subspecies on this character is warranted.

Within the short-billed populations occurring from the Pamirs to southern Tibet, birds in southern Tibet (along the outer fringe of the Himalayas between 80° and 90°E) have shorter wings than those in Lahul, western



**107.** Hand-held adult Lesser Sand Plover *Charadrius mongolus*. The blunt bill with rounded point and an obvious bulbous outer half are typical. Note the gentle slope of the upper mandible, resembling the outline of a well-sliced cheese.

Tibet and farther west. The difference is not very marked on the few birds examined, but more so in Stresemann's (1940) larger sample from southern Tibet and (especially) northern Sikkim, which included the type specimen of *atrifrons* (average wing of seven adults 123.7 mm, of nine juveniles 122.6 mm; total range 118-126 mm, once 128 mm). Moreover, those from southern Tibet have clearly darker upperparts than other populations, and the difference in wing length between darker and paler wintering birds supports the recognition of separate

**Table 6.** Measurements in mm of Lesser Sand Plover *Charadrius mongolus* of 'atrifrons group'. Figures show average (S.D.; sample) and range.

	WING	TARSUS	BILL LENGTH	BILL DEPTH NEAR TIP
<b>Breeders</b>				
(1)	130.1 (3.11; 16) 125-135 (mostly 129-134)	34.0 (1.57; 16) 31.5-38 (mostly 32-35)	18.0 (1.02; 16) 16.0-19.0 (mostly 17.5-19)	4.29 (0.144; 4) 4.2-4.5
(2)	126.0 (3.47; 17) 121-133 (mostly 121-128)	32.8 (1.37; 20) 30.4-35	16.7 (0.68; 23) 15.0-17.7 (mostly 16-17)	4.33 (0.152; 7) 4.1-4.5
(3)	129.1 (2.89; 20) 123-134 (mostly 127-132)	33.7 (1.06; 20) 32.2-35.5	16.8 (0.84; 20) 15.7-17.8	4.36 (0.151; 19) 4.1-4.6
(4)	129.1 (2.44; 12) 125-134 (mostly 127-131)	33.3 (1.39; 12) 31.6-35.0	17.3 (0.64; 9) 16.7-17.8	4.38 (0.182; 11) 4.1-4.6
(5)	132.0 (2.85; 8) 129-137	33.7 (1.39; 9) 32.1-35.8	17.3 (0.83; 8) 16.4-18.2	4.44 (0.187; 8) 4.2-4.7
<b>Migrants and winter birds</b>				
(6)	129.0 (2.45; 7) 126-132	33.1 (1.05; 7) 32.0-34.3	18.0 (0.63; 7) 17.5-18.7	4.54 (0.176; 7) 4.3-4.8
(7)	126.8 (1.17; 6) 125-129	32.3 (1.79; 6) 30.5-33.9	17.1 (0.50; 6) 16.6-17.6	4.30 (0.155; 6) 4.0-4.5
(8)	129.1 (0.74; 5) 128-130	33.5 (1.23; 5) 32.3-34.8	17.3 (0.85; 5) 16.6-18.0	4.60 (0.265; 5) 4.3-4.8
(9)	124.1 (3.01; 4) 120-127	32.6 (1.09; 4) 31.7-33.9	18.2 (0.97; 4) 17.6-18.9	4.30 (0.234; 4) 4.0-4.5
(10)	130.4 (1.52; 5) 129-132	32.5 (0.81; 5) 31.6-33.4	17.1 (0.88; 5) 15.9-18.0	4.27 (0.044; 5) 4.2-4.3
(11)	126.9 (3.56; 6) 122-131	33.9 (1.41; 6) 32.0-35.3	18.2 (0.68; 6) 17.7-19.3	4.42 (0.250; 6) 4.2-4.7
(12)	127.3 (2.31; 5) 125-130	33.8 (1.44; 5) 31.8-34.7	17.5 (0.97; 5) 16.1-19.3	4.41 (0.292; 5) 4.1-4.8
(13) (a)	130.8 (2.84; 53) 126-135	34.8 (1.09; 50) 33.5-37.1	18.8 (0.82; 58) 17.4-20.7	4.46 (0.185; 53) 4.1-4.8
(13) (b)	127.2 (2.28; 24) 124-132	34.5 (1.82; 5) 33.5-36.4	18.6 (0.72; 29) 17.2-20.4 (both mostly 18.2-19.5)	4.45 (0.187; 6) 4.3-4.8

#### Origins

- (1) Qinghai Hu (Kukunor) and upper Xining He area (NE Qinghai, China), including data from Stresemann (1940) = *schaeferi*.
- (2) S Tibet (Xizang Zizhiq, China) and N Sikkim (India), including data from Stresemann (1940) = *atrifrons*.
- (3) W Himalayas (Lahul, Kashmir, Ladakh) = *atrifrons*><*pamirensis*.
- (4) Wakhan (E Afghanistan), Pamir (E Tajikistan and westernmost Xinjiang, China) and W Kun Lun Mts (NW Tibet & SW Xinjiang) = *pamirensis*.
- (5) E Alai Mts and Tien Shan (Kyrgyzstan and NW Xinjiang) = *pamirensis* (slightly)><*mongolus*).
- (6) E Africa = *pamirensis*.
- (7) Red Sea and N Somalia = *atrifrons*.
- (8) Persian Gulf and Oman = cf. *pamirensis*.
- (9) Karachi (brown-tinged upperparts) = *atrifrons*><*pamirensis* (or mix of both: large S.D.).
- (10) Karachi (grey-tinged upperparts) = *pamirensis*.
- (11) Sri Lanka = *schaeferi* + *atrifrons* mix (or intermediates).
- (12) Calcutta and Andaman Is = *schaeferi* + *atrifrons* mix (or intermediates).
- (13) Sumatra, S Borneo and (especially) Java, data separated for adult (a) and juvenile plus first adult with juvenile wing (b) = *schaeferi*.

smaller/darker and larger/paler subspecies (e.g., birds from Karachi clearly fall into two groups on colour and size, irrespective of season: see samples 9 and 10 in table 6). Specimens from easternmost Afghanistan, the Pamirs in Tajikistan and western Xinjiang, and the western Kun Lun mountains hardly differ in size or colour from birds of the northwest Himalayas; those from the eastern Alai and Tien Shan ranges are very slightly larger and paler and more often

show small white patches on the forehead in breeding plumage.

Unfortunately, no specimens from the eastern Tien Shan or other mountain ranges in northern Xinjiang were examined. Some migrants from western Xinjiang had markedly long wings and bill, and may originate from northern Xinjiang. The long bill of the latter suggests at least some intergradation with long-billed birds of the 'atrilfrons group' from Qinghai, but their long wings



frame &amp; lens JENS HIRSCHFELD

**108.** Juvenile Lesser Sand Plover *Charadrius mongolus*, Oman, September 1997. This bird has a very short bill that looks pointed, but it is far too short for a Greater Sand Plover *C. leschenaultii*. Furthermore, the eye is small, and the bird's silhouette is more like that of Kentish Plover *C. alexandrinus* than that of Grey Plover *Pluvialis squatarola*.

and partial white forehead may also indicate even intergradation with nominate *mongolus* of the 'mongolus group' (e.g. in as yet undetected breeding sites in the mountains of the Altai or Gobi regions).

**2. The 'mongolus group'.** Samples of the various breeding populations were small (table 7). They differed sometimes considerably in average measurements, and some of the outlines in figs. 4-6 hardly overlap, but the variation would probably have been much greater and the overlap more extensive if larger samples had been available. The only population perhaps separable subspecifically on measurements is that of the Commander Islands, with on average shorter bill and tarsus than the other populations, and with longer wing.

These two groups form five subspecies.

#### *Subspecies recognised in Lesser Sand Plover*

As outlined above, three subspecies are recognisable in the 'atrifrons group'.

1. *atrifrons*. A small, dark, short-billed race in southern Tibet and northern Sikkim.

2. *pamirensis*. A larger, paler, short-billed race in the western part of the range of the 'atrifrons group'.

3. *schaeferi*. A larger, paler, long-billed subspecies in the eastern part of the range of the 'atrifrons group'.

In the 'mongolus group', at least two subspecies can be recognised, but how these are to be defined is more difficult to establish. Paler individuals breed from Lake Baikal east to the Amur area and north to the Verkhoyansk mountains, and darker ones from Kamchatka north to Chukotskiy and east to the Commander Islands, while more or less intermediate birds occur on the Pyasina Peninsula in the northern Sea of Okhotsk. In terms of size, all mainland breeders are more or less similar, whereas Commander birds differ mainly in their short tarsus and bill. The 'mongolus group' could be seen to comprise three races (paler long-legged birds with variable bill length in the west of the range, darker long-legged and fairly long-billed birds from Kamchatka north to Chukotskiy, and darker short-legged and short-billed birds on the Commanders), but variation in bill length of western specimens and in tarsus length of Kamchatka-Chukotskiy birds is large, and samples of breeders examined were too small to support extensive splitting. Only two subspecies are recognised here.

4. *mongolus*. A paler race from Lake Baikal to Amurland and the Verkhoyansk range.

5. *stegmanni*. A darker, short-legged race on the Commanders, and provisionally including population from Kamchatka to Chukotskiy (latter considered intermediate, matching Commander birds in plumage—and sometimes in tarsus length, but not bill length, so

**Table 7.** Measurements in mm of Lesser Sand Plover *Charadrius mongolus* of nominate 'mongolus' group.

Figures show average (S.D.; sample) and range.

	WING	TARSUS	BILL LENGTH	BILL DEPTH NEAR TIP
<b>Breeders</b>				
(1)	136.0 (2.65; 3) 134-139	32.1 (0.25; 3) 31.9-32.4	17.1 (0.30; 3) 16.8-17.4	5.10 (0.200; 3) 4.9-5.3
(2)	133.7 (2.40; 6) 130-137	31.3 (1.00; 6) 30.0-32.6	16.0 (0.82; 6) 15.0-16.9	4.74 (0.432; 6) 4.4-5.6
(3)	136.6 (4.44; 7) 133-146 (mostly 133-138)	31.5 (1.77; 7) 29.3-34.2 (mostly 30-33)	16.8 (0.38; 7) 16.4-17.5	4.94 (0.299; 6) 4.6-5.4
(4)	137.1 (4.02; 5) 133-144	29.4 (0.73; 5) 28.9-30.5	15.7 (0.44; 5) 15.2-16.2	4.98 (0.164; 5) 4.8-5.2
<b>Migrants and winter birds</b>				
(5)	133.9 (2.88; 23) 129-139	31.2 (1.03; 18) 29.9-32.8	16.3 (0.75; 20) 15.0-17.4 (mostly 16-17)	4.72 (0.383; 19) 4.3-5.2
(6)	134.3 (2.94; 13) 128-139	31.7 (0.65; 9) 30.8-32.3	16.8 (0.93; 10) 15.8-17.7	4.75 (0.225; 10) 4.5-5.1
(7)	134.8 (3.49; 5) 130-139	31.9 (0.97; 4) 31.1-32.6	16.3 (0.59; 5) 15.6-17.2	4.75 (0.129; 4) 4.6-4.9
(8)	136.4 (4.03; 17) 129-145	30.7 (1.47; 15) 28.0-32.5	16.1 (0.81; 17) 14.7-17.2	4.82 (0.237; 20) 4.6-5.2
(9)	137.9 (1.56; 6) 136-140	32.3 (1.58; 5) 29.8-33.6	16.9 (0.62; 5) 16.1-17.4	4.84 (0.152; 5) 4.7-5.0
(10)	136.0 (3.72; 17) 130-142	31.2 (1.72; 16) 28.5-33.3	16.8 (0.57; 17) 15.8-17.6	4.76 (0.195; 16) 4.4-5.1
(11)	135.6 (4.79; 9) 131-146	29.6 (1.05; 6) 28.1-30.9	16.7 (0.72; 6) 15.8-17.6	4.76 (0.201; 6) 4.5-5.0

**Origins**

- (1) E Lake Baikal and W Stanovoi Mts, late May and June = *mongolus* (perhaps slightly ><*pamirensis*).
- (2) inland of Russian Far East, 1st-17th July = *mongolus*.
- (3) NE Siberia (Chukotskiy, Koryakland and N Kamchatka region, including Karaginskiy I, May-Aug = *mongolus*><*stegmanni* or a separate, unnamed race.
- (4) Commander Is, May = *stegmanni*.
- (5) coasts of Russian Far East (Amurland, Ussuriland), early May and mid July to Sept = *mongolus* + *mongolus*><*stegmanni* mix (see 3).
- (6) E China, May and Aug-Oct = *mongolus*.
- (7) Thailand and Greater Sundas (W Indonesia), Aug-May = *mongolus*.
- (8) Japan (including Ryu Kyus), April-May and Aug-Sept (Ryu Kyus also in winter) = *stegmanni* + *mongolus*><*stegmanni* mix.
- (9) Philippines, Nov-May = *mongolus*><*stegmanni*.
- (10) Wallacea (Sulawesi, Moluccas, Kai), westernmost New Guinea (Vogelkop, Aru) and W Australia, Aug-May = *mongolus*><*stegmanni*.
- (11) E Australia and Solomons, Aug-Apr = *stegmanni* + *mongolus*><*stegmanni* mix.

far as can be judged from the small samples —and the more western 'mongolus' group' individuals in measurements, except sometimes tarsus).

**Subspecific winter distribution**

The following conclusions are based largely on biometric data.

**Greater Sand Plover (fig. 11, page 186)**

Some wintering populations are clearly attributable to a single subspecies. All specimens from Egypt and the Levant coast (sample 5 in table 5, dated July-February) are *columbinus*, but for a single undated bird from northern Israel which has *crassirostris* measurements; and all Indonesian birds (sample 11) are nominate *leschenaultii*.

Perhaps more surprising is that, on measurements, East African and Karachi birds (samples 9 & 10) are also largely nominate, though apparently with some *crassirostris* admixed (the bill appears too deep for pure *crassirostris*, which, despite that name, has a more slender bill than nominate). It seems that at least part of the western population of nominate *leschenaultii* (from easternmost Kazakhstan, Kyrgyzstan and Xinjiang) migrates southwest rather than southeast.

Samples 6-8 in table 5 are a mixture of various races. Birds from the Persian Gulf and Oman (sample 8) consist of two *columbinus* (both from southern Iraq, August), the remaining 11 being *crassirostris*, probably admixed with a few nominate *leschenaultii*. Those from the central Red Sea south to

S. L. Rivers



**109.** Greater Sand Plover *Charadrius leschenaultii* of subspecies *columbinus*, Israel, April 1996. Quite long, pointed bill. Obvious rufous-cinnamon fringes to upperparts show that this bird is of subspecies *columbinus*.

Somalia (samples 6 & 7) consist of ten probable *crassirostris* (August–February, one June) and 30 probable *columbinus* (mostly June–March), although as many as 13 of the latter have wing below 140 mm, whereas, of 25 adult Middle East *columbinus*, only one (a female from 'northern Syrian Desert', May) has wing below 140 mm. These samples include two adults with wing of 135 mm: one taken on 24th April 1919 on Aibat Island, off Saylac, northwest Somalia (close to Saad e' Din Island, where a pair with small pulli has been found: Archer & Godman 1937),



Ray Tipper

**110.** Lesser Sand Plover *Charadrius mongolus* of nominate subspecies *mongolus*, Hong Kong, April 1988. Note the dark line bordering the breast-band, and the dark, intense rufous coloration of the breast-band.

and another, with plumage condition indicative of possible breeding, taken on 15th May 1934 at Lake Assal in Djibouti. Although denied by Vaurie (1965), the rumour that a population of Greater Sand Plovers breeds along the Red Sea and in the Gulf of Aden may be true; as elsewhere, breeding sites are often occupied only temporarily and erratically, depending on local rains, and nests are difficult to find. It is possible that a population breeds along the Red Sea that is similar to *columbinus*, but with shorter wing and perhaps shorter tarsus.



Alan Harris

**Fig. 10.** Non-breeding plumages of Greater Sand Plover *Charadrius leschenaultii*. (Lesser Sand Plover *C. mongolus* in these plumages is almost identical.)

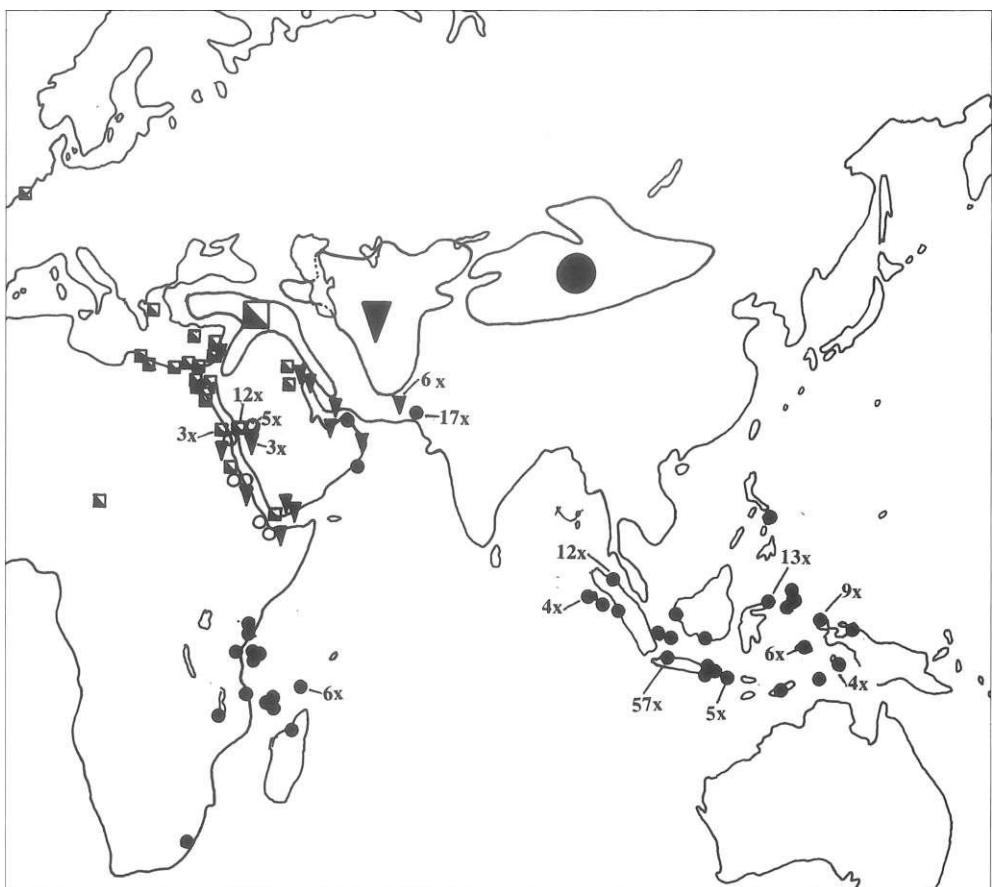


Fig. 11. Non-breeding distribution of races of Greater Plover *Charadrius leschenaultii*.

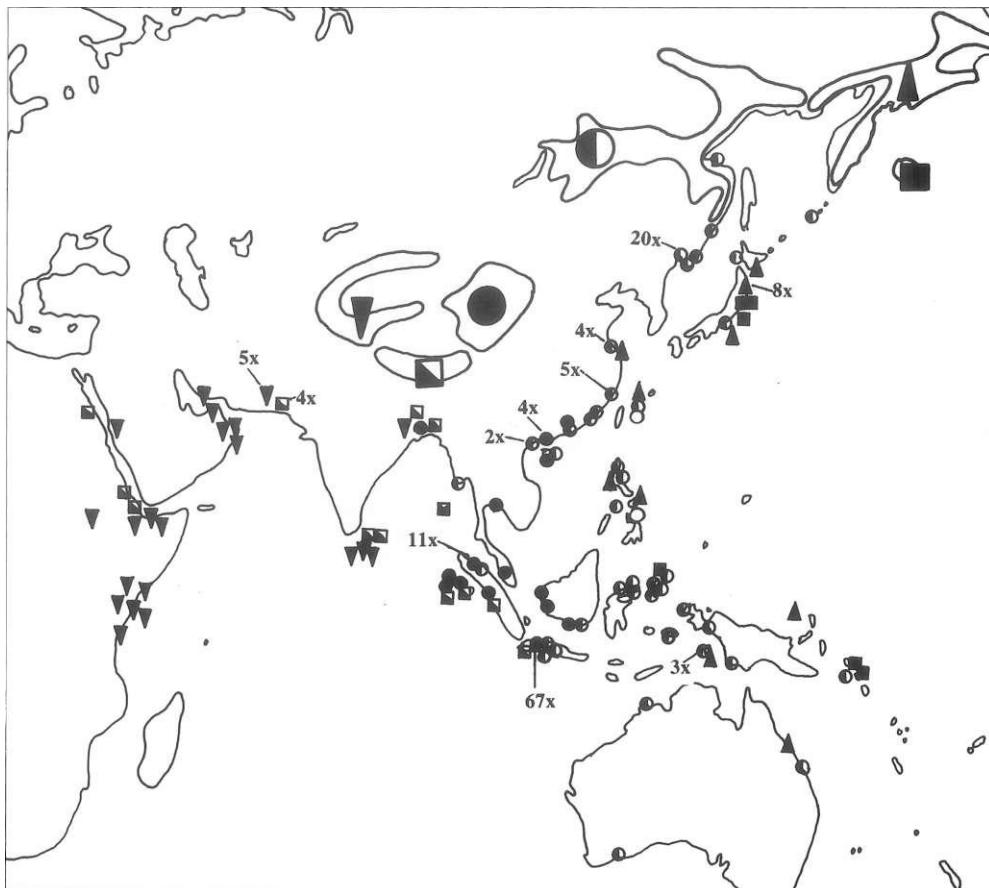
Breeding ranges (in part hypothetical) outlined in black, with large symbol in centre. Bicoloured square = larger *columbinus* from Middle East; open dot = smaller *columbinus* possibly breeding along shores of Red Sea; black triangle = *crassirostris*; black dot = nominate *leschenaultii*. Numbers refer to larger samples from a site.

#### Lesser Sand Plover (fig. 12)

As discussed above, it is difficult to assign many Lessers to a particular race on measurements. Existing data are summarised in tables 6 & 7. Using biometrics in combination with darkness or paleness of plumage, we have presented a tentative picture of subspecific winter distribution in fig. 12; this is considered the best possible interpretation of the data according to present knowledge, but it is far from being definitive. Some individuals appear intermediate, or seem likely to belong to an atypical population of a particular subspecies, while the possibility of the existence of as yet undiscovered

breeding populations has also to be borne in mind.

Nevertheless, the race *schaeferi* is easy to recognise by measurements and plumage, as are *stegmanni* from the Commander Islands and *mongolus* from inland East Siberia. While *atrifrons* and *pamirensis* are separable from the others as a group, within that group variation from typical *atrifrons* to typical *pamirensis* is clinal and some specimens from wintering grounds are therefore hard to assign to one or the other. Similarly, the Anadyr and Chukotskiy population is more or less intermediate between *stegmanni* and nominate *mongolus*.



**Fig. 12.** Non-breeding distribution of races of Lesser Sand Plover *Charadrius mongolus*.

Breeding ranges (in part hypothetical) outlined in black, with large symbol in centre. Black downward-pointing triangle = *pamirensis*; bicoloured square = *atrifrons*; black dot = *schaeferi*; bicoloured dot = nominate *mongolus*; black upward-pointing triangle = *stegmanni* (Kamchatka-Chukotskiy population); black square = typical *stegmanni* from Commander Is. Numbers refer to larger samples from a site.

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- To save space, not all references on distribution cited below the maps are listed here. Details of most or all of these can be found in the later volumes of BWP, or can be obtained from CSR. A full list of all references consulted has been deposited at the Alexander Library of the EGI, Oxford.
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## Appendix 1

### Nomenclature of subspecies of Greater Sand Plover

The correct naming of the three races is difficult to establish. Of the valid names available, the taxon *leschenaultii* was described by Lesson in 1826 from a

wintering bird in Pondicherry (southeast coast of India); *geoffroyi*, described by Wagler in 1827, was based on winterers from Pondicherry and Java; *columbinus* Wagler, 1829, was based on a juvenile or winter-plumaged bird taken by Hemprich & Ehrenberg in Arabia (probably on coast of Red Sea); and *gigas* Brehm, 1855, was based on a bird taken in

November in Suez. Only the name *crassirostris* of Severtzov, 1873, was based partly on breeding birds, but the type series came from localities as far apart as 'Perovsk [now Kzyl-Orda, Kazakhstan], Chatir-Kul [now Chatyrkél, south-central Kyrgyzstan], and the eastern coast of the Caspian Sea near the Gulf of Krasnovodsk [western Turkmenistan]'.

Although relatively few of the many winter birds from India in the BMNH were examined, and none from Pondicherry, it is likely that Pondicherry is visited only by individuals of the Eastern group, especially as eastern populations predominate even as far west as southern Pakistan (Karachi) and East Africa, and the specimens from that part of Indonesia nearest to Pondicherry (18 skins from Simeuluë, Nias and western Sumatra) are all of eastern origin according to measurements. The name *geoffroyi* is a newer name for birds of the same eastern origin.

The type of *columbinus* is still available at the Zoological Museum in Berlin; from its measurements (wing 135 mm, bill 22 mm; Ticehurst 1929), the small, short-billed Middle East population should be known by this name. Moreover, of 33 skins examined from the northern and central Red Sea, only two are definitely Transcaspian birds by measurements, the remainder (all small and short-billed) being similar to Middle East breeders; also, a bird ringed on 7th September 1981 at Suakin (Sudan) was recovered in its probable breeding area in inland Syria on 3rd April 1982 (*Wader Study Group Bull.* 55: 39). The name *gigas* is a junior synonym of *columbinus*, as concluded from measurements of the type (wing 137 mm, bill 22.5 mm; Ticehurst 1929) and from its wintering site.

Two localities from which the taxon *crassirostris* was described, Perovsk and the east shore of the Caspian, are within the breeding range of the Transcaspian group. The third, Chatir-Kul, is not known to harbour breeding Greater Sand Plovers (it has Lesser instead), although the Chatir-Kul specimen is dated 8th August 1867 and is thus probably a migrant, from either the Transcaspian or the Eastern group. Nevertheless, as both other localities are in the breeding range of the Transcaspian group, the name *crassirostris* is preferred for this group, in accordance with Chelstsov-Bebutov's (1976) proposal in his revision of the Soviet forms of Greater Sand Plover.

Thus, as in BWP (vol. 3), three races are recognised, *columbinus*, *crassirostris* and nominate *leschenaultii*, though the boundaries between the subspecies differ somewhat from those given in BWP (see fig. 1).

#### Nomenclature of subspecies of Lesser Sand Plover

For the five possible races, the following taxon names are available. In the *mongolus* group: *mongolus* Pallas, 1776, described from the salt lakes close to the Mongolian border (in Russia; type obtained 28th-31st May 1772 at Tarey-nor, south of Kulusutay in southern Buryat Republic); *cirrhepidesmus* Wagler, 1827, no locality given (type in Paris Museum); *sanguineus* Lesson, 1828, no locality given (type in Paris Museum); *inornata* Gould, 1846, Australia; *mastersi* Ramsay, 1876, northeast Queensland; *litoralis* Stegmann, 1937, described from a male taken 18th May 1929 on Bering Island in the Commander Islands; as *litoralis* was already in use for another species of *Charadrius*, the name was replaced by *stegmanni* (by Stresemann in 1940).

In the 'atrifrons group': *atrifrons* (name based on a breeding-plumaged adult male), described by Wagler

in 1829 from Bengal, is available, as well as *inconspicuus* Wagler, 1829, also from Bengal. Other valid names are *pyrrhotorax* Gould, 1837, without locality (type in Leiden Museum, obtained from St Petersburg Museum); *rufinellus* Blyth, 1843, from Calcutta; *pamirensis* Richmond, 1896, based on an adult male obtained 16th June 1894 at Tagdumbash Pamir (about 37.30°N, 75.15°E, western Xinjiang); and *schaeferi* Meyer de Schauensee, 1938, based on an adult male taken 13th June 1935 in Tibet at Schäfer's Camp 104, about 100 miles north of Jyekundo [= Yushu; the site of Camp 104 is south of the Bayan Har Shan Mts in southeast Qinghai, China, at about 34.20°N, 96.45°E according to Schäfer & Meyer de Schauensee 1939, but at about 33.50°N, 97.10°E according to Vaurie 1972].

In the 'mongolus group', the type locality Kulusutay of nominate *mongolus* is within the range of migrants of the paler and rather long-legged and long-billed birds breeding from northern Transbaikalia to Amurland; hence, the latter should be known by this name. For the darker, short-legged, short-billed birds from the Commander Islands, the name *stegmanni* can be used. If the dark but fairly long-legged and long-billed birds from the mainland between Kamchatka and Chukotki are to be separated as a subspecies, one of the other names (*cirrhepidesmus*, *sanguineus*, *inornata*, *mastersi*) is perhaps available; populations in this area are, however, better considered an intermediate form between nominate *mongolus* and *stegmanni*, thus recognising only two subspecies within the 'mongolus group', in agreement with, e.g., Kishchinski (1968), who considered all dark birds to be *stegmanni*.

In the 'atrifrons group', the type of *atrifrons* from Bengal is a small dark bird, inseparable from the breeding population of southern Tibet and northern Sikkim (Stresemann 1940), and hence the population of the central-southern Himalayas should be known as *atrifrons*. From (about) the same type locality as *atrifrons*, *inconspicuus* and *rufinellus* are likely to be synonyms of that, as most wintering birds examined from this area are also dark and small. The type of *pyrrhotorax* (dark and small, wing 125 mm, tarsus 32.5 mm, bill 16.6 mm) also belongs to *atrifrons*. The name *pamirensis* is available for the paler and larger but fairly short-billed birds from the Pamirs and neighbouring parts of Wakhan, Lahul, Ladakh and Kashmir; as well as from the western Kun Lun, eastern Alai and Tien Shan. The distinct pale, large and long-billed subspecies wintering in western Indonesia (average wing 130.8 mm, bill 18.8 mm) has probably to be named *schaeferi*. The type of *schaeferi* from southeast Qinghai, though long-billed, is almost as dark as *atrifrons* from southern Tibet and, although birds from nearby northeast Qinghai are about as pale as Indonesian birds (and as *pamirensis*), the bill appears to be shorter than in Indonesia: the wing of the type of *schaeferi* and that of another skin from southeast Qinghai are 128 and 131 mm, and the bill of both 19 mm; average wing of birds from northeast Qinghai is 130.7 mm, bill 17.6 mm (Meyer de Schauensee 1937; Stresemann et al. 1938; Stresemann 1940). The name *schaeferi* should perhaps be restricted to darker long-billed birds from southeast Qinghai, but, for stability in naming the taxon as recognised here, it includes paler, shorter-billed birds from northeast Qinghai, as well as paler long-billed individuals from unknown breeding grounds wintering in western Indonesia, in agreement with BWP.

