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# Identification of Saunders's Tern and Little Tern, with special emphasis on juvenile and winter plumages

Killian Mullarney & Oscar Campbell

Saunders's Tern *Sternula saundersi* is a strictly coastal breeder in the Persian Gulf, central and southern Red Sea, Pakistan and, very locally, in India, Sri Lanka and the Maldives (Jennings 2010, Rasmussen & Anderton 2012, Anderson & Shimal 2020). The exciting discovery of a small colony of Saunders's at Ras Sudr, Sinai, Egypt, in July 2012 was the first record of this poorly known species breeding within the Western Palearctic region as defined by BWP (Cramp & Simmons 1977, Habib 2014). With this colony having become established over subsequent years (Habib 2016; Mohamed Habib pers comm, December 2020), Saunders's was deemed to qualify for inclusion in a forthcoming new edition of the Bonniers/Collins Bird Guide (Svensson et al in press).

When Killian Mullarney commenced work on a new plate for the guide in December 2020, it was envisaged that treatment of Saunders's Tern would not extend much beyond the identification of breeding plumaged adults, as distinguishing all other plumages of Saunders's from Little Tern *S. albibrons* is regarded as extremely difficult (eg, Cramp 1985, Olsen & Larsson 1995, Stevenson & Fanshawe 2002, van Duivendijk 2010, Porter & Aspinall 2010, Redman et al 2011, Rasmussen & Anderton 2012). Most European birders encounter *Sternula* terns popularly believed to be Saunders's in the field during winter trips to Oman or eastern Africa but those who make the effort to critically examine such wintering *Sternula* flocks have generally come away more perplexed than enlightened. Received wisdom, derived from a range of field guide treatments, is that the darker shade of grey (than in Little) on the rump and tail and a minimum of three dark outer primaries are features indicative of Saunders's. Seemingly, few observers record Saunders's and Little together, presumably because Little is considered merely an uncommon passage migrant in spring and autumn in Oman (Eriksen & Victor 2013, who suggest that Little is 'probably overlooked ... due to similarity to more common Saunders's Tern') and 'occasional' in coastal Kenya and Tanzania (Stevenson & Fanshawe 2002).

The Cornell Lab of Ornithology's online database eBird (Sullivan et al 2009; www.ebird.org) is an enormously useful archive, used extensively by both KM and Oscar Campbell when researching species. When KM commenced research of Saunders's Tern in December 2020, some 130 checklists therein contained *Sternula* images identified as Saunders's. Concentrating initially on photographs of adults in summer plumage, he noticed that a number of the more distinctive individuals, identified by their characteristic head pattern, were birds photographed by OC at breeding colonies off Abu Dhabi, United Arab Emirates (hereafter UAE).

KM noticed that most images of birds in flight or with open wings, from across their breeding range, gave the impression of having pale (almost whitish) secondaries and, to a lesser extent, inner primaries, creating an upperwing pattern somewhat reminiscent of Sabine's Gull *Xema sabini*, albeit much less clear-cut and contrasting. Several also seemed to have a rather heavy bill compared with Little Tern but this difference was more subtle and often difficult to judge. The impression of an extensive white panel on the rear part of the wing was even more striking on juvenile birds and appeared to be significantly more pronounced than the pale but always at least weakly marked rear part of the wing KM had observed on juvenile Little, mostly in Greece and Ireland.

Excited by the potential significance of this apparently distinctive difference in wing pattern, KM contacted OC, to initiate discussion. In the UAE, separation of Saunders's Tern from Little Tern has been long regarded as complicated, to say the least. Despite visiting both the UAE and Oman in April 2005, and residing in Abu Dhabi from August 2006, OC did not formally 'tick' Saunders's until March 2007, when summer-plumaged birds became obvious inshore. Cautious observers in the UAE have long avoided specifically identifying any *Sternula* terns in winter plumage, with the result that the relative status of both Saunders's and Little has remained mired in confusion (Pedersen & Aspinall 2010). Little is



**215** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, adult summer, Gayal, Saudi Arabia, 31 May 2021 (David Darrell-Lambert). Note whitish rear of inner wing, most obvious on right wing from this angle; lack of narrow but contrasting white secondary tips also readily apparent. In addition, note lack of contrasting white rump.  
**216** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, juvenile, Habitat Island, Abu Dhabi, United Arab Emirates, 23 May 2020 (Oscar Campbell). Note very extensive white triangle on rear wing and contrastingly dark outer primaries and primary coverts, creating much bolder pattern than seen in juvenile Little Tern *S. albigrons*.





**217** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, adult winter, Bird Island, Seychelles, 23 November 2013 (Stewart Smyth). Mostly whitish crown with very indistinct definition to pale 'eyebrow', seemingly slightly in front of eye. Primary moult nearly complete, p9-10 still growing; note that even very fresh outer primaries are quite dark grey (darker than similarly fresh primaries in Little Tern *S. albigrons*; cf plate 266) and impression of distinctly whitish shafts, contrary to what is associated with Saunders's. Secondary and inner primary pattern consistent with that exhibited by summer-plumaged adults and juveniles: whitish, lacking any suggestion of well-defined white tips so there is no narrow white trailing edge.

known to certainly occur, mainly identified at inland waters during spring migration (March to May) but the 'gut feeling' of local observers (including OC) was that *Sternula* in winter in the Persian Gulf were likely to be mainly (if not wholly) Saunders's, based on proximity to breeding colonies and the uniform (and often markedly dark) leaden-grey 'saddle', rump and much of the wing. This was notwithstanding the contention of Cramp (1985) that Little winters commonly in the Persian Gulf and recent documentation of Little with strikingly dark grey upperparts on the Mediterranean coast of Israel (Yosef Kiat in Perlman 2015). With regard to UAE waters on the Gulf of Oman, remote from Saunders's colonies and where coastally migrating Little might be expected to be more frequent (and are well documented in spring), the situation was even more confused. As elsewhere, critical inspection of non-breeding *Sternula* flocks in Oman and the UAE soon revealed variations in, for example, mantle/rump contrast, precise details of head pattern and number of dark outer primaries but con-

sistent correlation of one feature with others seemed non-existent; hence, categorisation of birds to one or other of a dichotomous group appeared impossible.

Examination of many eBird images of winter-plumaged *Sternula* terns, identified as Saunders's Tern in, eg, the UAE, Oman, eastern Africa and Madagascar failed to produce any convincing examples of birds with the extensive white in the rear wing. Indeed, the vast majority of birds appeared indistinguishable from wintering Little Terns in areas where Saunders's should be rare or absent, eg, India and Thailand. In addition, examination of wing patterns on such birds failed to provide any useful insight. This was perplexing, as birds readily aged as first-winters in autumn (prior to any moult of the remiges) should surely retain their secondaries, which in the case of Saunders's should still be as distinctly white as in juvenile plumage?

Finally, KM realised that a potential explanation could be that *none* of the images examined depicted actual Saunders's Terns. What if, in reality, this species is completely absent, or vastly out-

numbered by Little Terns in all countries from where images had hitherto been sourced? To test this hypothesis, KM sought Saunders's Tern images from locations where Little Tern is regarded as rare, beginning with the Seychelles. After the many hours devoted to scrutinising numerous images over the previous weeks, the results were a revelation: whilst a comparatively small sample, all the *Sternula* terns photographed on Bird Island in the Seychelles showed an obviously whitish hindwing that contrasted strongly with black outer primaries. Moreover, they also looked consistently *pale*, pearl-grey on the upperparts and, surprisingly, most had an almost entirely white crown, giving them a head pattern reminiscent of a miniature Black-naped Tern *Sterna sumatrana*. The overall impression of these birds was quite strikingly different from all the presumed winter-plumaged Saunders's photographed in Arabia and eastern Africa, which generally exhibited a slightly darker grey upperside, rump and tail as well as a dusky crown, giving definition to a short white 'eyebrow', subtly mirroring the diagnostic extent of the white forehead in summer-plumaged Little. Further searches for Saunders's photographs produced images from Bangaram Island (Lakshadweep, India), Kandooma Island (Maldives) and South Island, Cocos (Keeling) Islands in Australian territorial waters, where it has recently been established that Saunders's occurs (Menkhorst et al 2017). Of particular significance was a BirdLife Australia Rarities Committee (BARC) submission by Nigel Jackett et al (2019) that documented with photographs a high-tide roost of at least 12 Saunders's and four suspected Little observed together on South Island on 10 February 2019. An earlier series of photographs from the same location on 12 January 2010 was supplied by Tony Palliser; with the benefit of this new insight, it could be ascertained that the small flock of terns comprised at least 10 Saunders's and six Little, side-by-side. Analysis of all these photographs, as well as the observations by Jackett et al (2019), supported our impression that Saunders's is actually more easily separated from Little in winter plumage than it is in summer plumage. It also strengthened our conviction that the general consensus regarding Saunders's being the default *Sternula* species in Arabian waters in winter is based on a fundamental misconception of certain key identification characters, that became reinforced through repetition in all of the standard references produced over the last 40 years or so.

Saunders's Tern is monotypic whereas Little Tern has three generally recognised subspecies,

with ranges from Europe to central and southern Asia (nominate *S a albifrons*), in western Africa (*S a guineae*) and from Sri Lanka to East Asia and Australia (*S a sinensis*, here including *pusilla*, which is not recognised by all authorities) (Olsen & Larsson 1995, Rasmussen & Anderton 2012, Gill et al 2022). Note that all comparative comments made hereafter apply between Saunders's Tern and nominate Little Tern, this being the only subspecies with which Saunders's widely overlaps in range (although Saunders's breeds in mixed colonies with *sinensis* Little in northern Sri Lanka; Panagoda et al 2020; Gary Allport in litt). We have not closely examined the subspecific characteristics of Little but a superficial examination of images of birds in Australia implies that at least some birds from that country (but seemingly not in Thailand, Malaysia and Japan, which are also regarded *sinensis*) may be closer in certain characters (such as upperpart colouration, 'winter' plumage head pattern) to Saunders's than nominate Little are.

## Identification of Saunders's Tern

Until now, the only plumage of Saunders's Tern that has received detailed treatment in identification texts has been adult summer plumage, with differences in head pattern, extent of black in the outer wing, leg colour and degree of contrast between rump/tail and 'back' long promoted as the most useful means of separating Saunders's and Little Terns in the field. Winter and juvenile plumages of the two species have generally been regarded as inseparable outside the breeding season (eg, Cramp 1985, Olsen & Larsson 1995, Stevenson & Fanshawe 2002, van Duivendijk 2010, Porter & Aspinall 2010, Redman et al 2011, Rasmussen & Anderton 2012). Very recently, some key plumage features of both adult breeding and juvenile Saunders's were well illustrated by Hans Larsson in Harrison et al (2021), although the artist's insights therein have not been capitalised on by the authors of the corresponding text. It is our contention that the main obstacle to resolution of the identification problem posed by Saunders's and Little in winter has been the widespread perception that *Sternula* terns wintering in certain comparatively well-watched parts of eastern Africa and the Middle East comprise both species, or are predominantly Saunders's. In fact, it seems that Saunders's is actually very scarce or entirely absent from these locations during winter and most, if not all, of these presumed Saunders's are in fact Little.

Here, we present what we consider to be the most reliable means of identifying the two species in adult summer, juvenile and winter plumages respectively, based on our field observations of Little Terns in all of these plumages, and Saunders's Terns in the summer months (OC), as well as thorough examination of numerous photographs of both species taken throughout the year, many of which can be viewed at [www.ebird.org](http://www.ebird.org). We have chosen the sequence of treatment that follows to reflect the thought process underlying how this paper evolved and the fact that it was examination of summer and then juvenile plumages that finally provided the key to unlock the puzzle of winter plumage. Figure 1-3 and plate 215-217 capture the essential field characters of Saunders's Tern for each of the three plumages discussed. We have limited experience of presumed second-summer Saunders's Terns but a short discussion of such birds is presented in an extended caption to plate 269-270.

### **Adult summer plumage**

#### *Rear wing*

A subtle, but often very useful, difference in the wing pattern is the impression of a broad *whitish panel* that is most prominent on the secondaries and may appear, depending on lighting conditions, to extend diffusely to the outer greater coverts and the inner primaries. This character appears to have been largely overlooked until now. Its obviousness may be reduced in either intense, direct sunlight or strong shadow but at times this feature can be striking, especially in well-exposed photographs which freeze detail that can be hard to discern on a moving wing in the field (plate 218). In such images, the secondaries, innermost primaries and even the tips of the greater coverts can appear almost uniformly white, merging imperceptibly with the pale grey forewing. Of course, typical field views will not often allow appreciation of such fine detail, and the effect becomes that of a broad, diffuse whitish triangle on an otherwise pale grey and black wing (plate 219-220).

Whilst adverse light conditions or photographs of the wing viewed from certain angles may at times cause the secondaries of adult summer Little Tern to appear very pale, generally the upperwing appears uniformly grey with narrow white tips to the secondaries forming a thin but well-defined trailing edge (plate 226 and 234-235). Such a defined trailing edge does not occur in Saunders's Tern in any plumage. Having dis-

covered this important 'new' feature independently, we subsequently came across mention of it in Menkhorst et al (2017). Subsequent research suggests that the 'broad white triangular area on the rear of the wing' was first noted in print by Carter & McAllan (2007) in their documentation of the first recorded occurrence of Saunders's on the Cocos (Keeling) Islands in the winter of 2006-07. Discussion of Little momentarily exhibiting more extensive white secondaries is presented in plate 228-231.

#### *Folded primaries*

At rest, when it is not possible to determine the open wing pattern, the prominence of the white inner border to the folded primary tips can provide a useful clue to a bird's identity; in Saunders's Tern the border is comparatively thick, especially on the innermost of the exposed primary tips, whereas on Little Tern it tends to look thinner and less prominent (compare plate 221-223 with plate 224-225 and 227). Though less pronounced, this feature is similar to the difference in wing pattern between Roseate Tern *S dougallii* and Common Tern *S hirundo*, and applies to birds in all plumages, provided the primaries are not extremely worn. Due to the paleness of the grey upperside in Saunders's, this white border is sometimes difficult to detect as a contrasting line, especially in harsh sunlight. The slightly darker grey of the primaries on Little may render the white border a little more distinct, but it tends to look very narrow compared to Saunders's, and in some individuals is not apparent at all (plate 226).

#### *Primary 'wedge'*

It is well known that Saunders's Tern tends to have a more extensive black 'wedge' on the outer wing than usually seen in Little Tern, typically comprising three (sometimes four to five) primaries and corresponding primary coverts in summer-plumaged birds, as opposed to one to three dark primaries in summer-plumaged Little. In all tern plumages (other than juvenile), the tonal contrast between paler and darker primaries is generally an indicator of the relative age difference in the feathers; when fresh, the upper surfaces of the feathers have what has been described as a powdery pale grey 'bloom' (the actual explanation is special lengthened and twisted barbules that are very susceptible to damage; Galván et al 2009) which wears off gradually to reveal progressively more of the darker base colour of the feather. If retained for long enough, primaries that start off a pale silvery-grey colour will eventually become

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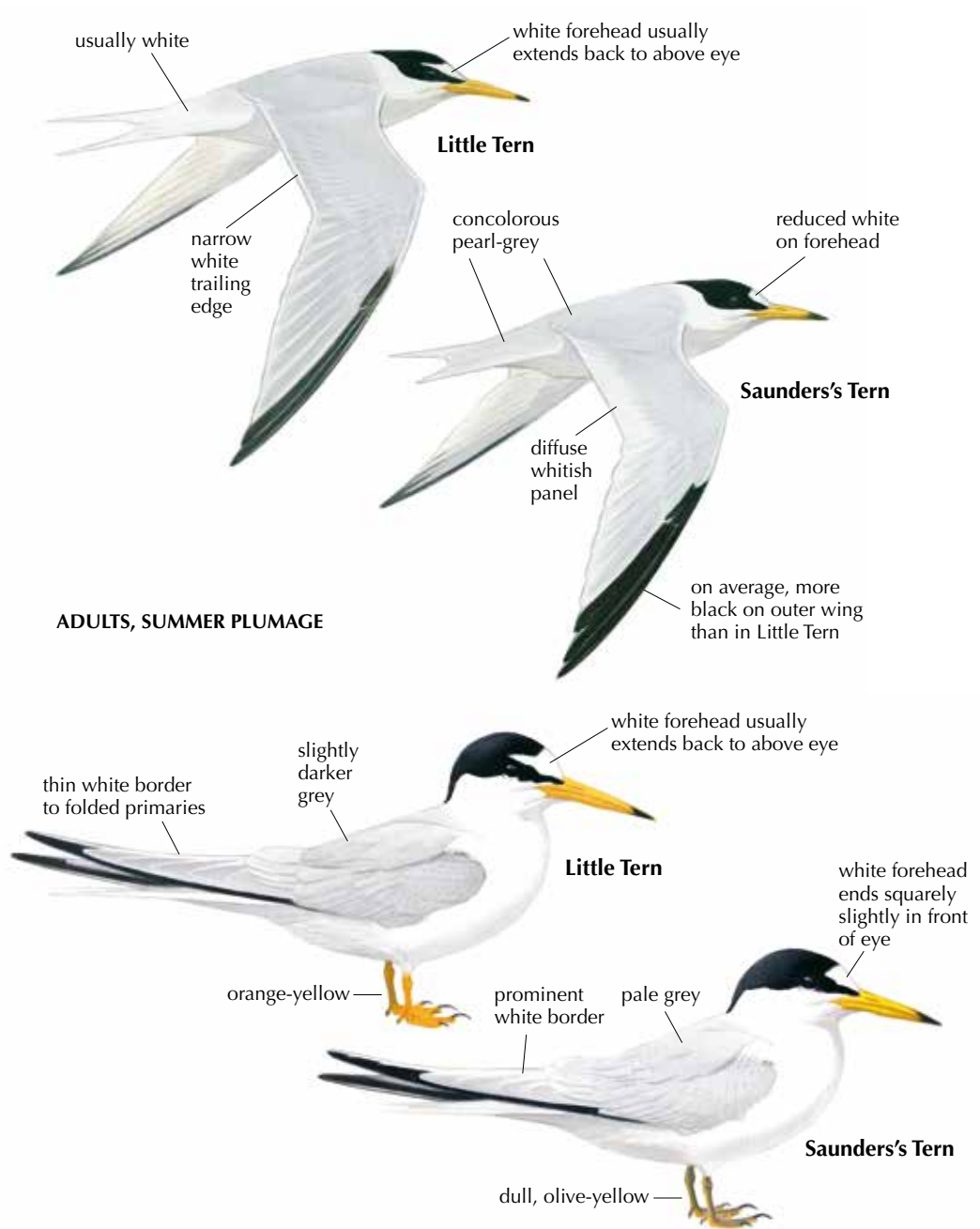


FIGURE 1 Salient identification features of adult summer Saunders's Tern / Saunders' Dwergstern *Sternula saundersi* and Little Tern / Dwergstern *S. albifrons* (Killian Mullarney)



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**218** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, adult summer, Abu Dhabi Island, United Arab Emirates, 10 May 2019 (*Desmond Lobo*). In certain light conditions, diagnostic upperwing pattern may be enhanced by momentary impression of exaggerated contrast; note that in typical field views (and most images), pattern is much less obvious than depicted here.

**219** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, adult summer, Habitat Island, Abu Dhabi, United Arab Emirates, 3 May 2019 (*Oscar Campbell*). Note impression of whitish rear inner wing and almost concolorous grey on saddle, rump and central tail.

**220** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, adult summer, Habitat Island, Abu Dhabi, United Arab Emirates, 15 May 2015 (*Oscar Campbell*). From this angle, rear of wing is less strikingly patterned than on individual in plate 219 and rump and central tail appear slightly paler than saddle. However, no hint of sharp white trailing edge, nor of clearly contrasting white rump patch.

**221** Saunders's Terns / Saunders' Dwergsterns *Sternula saundersi*, adult summer, Lulu Island, Abu Dhabi, United Arab Emirates, 19 March 2021 (*Ted Burkett*). White forehead of bird on right does not extend to above eye but is a little more pointed at rear extremity when viewed from this angle; birds with such patterns need to be interpreted with care if position of eye is not clear. Note also pale upperparts, rather dark, drab leg colour and prominent white upper edge to folded primaries.





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**222** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, adult summer, Lulu Island, Abu Dhabi, United Arab Emirates, 12 March 2021 (*Ted Burkett*). White forehead does not extend to above eye but is a little more extensive and Little Tern *S albifrons*-like than usual. Note paler grey upperparts (here mainly in shadow) and darker, rather dull olive legs compared with Little.

**223** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, worn adult summer, Umm al-Quwain, United Arab Emirates, 7 July 2020 (*Stephen Taylor*). Note very worn, whitish looking wing-coverts contrasting with fresh-looking but still very pale grey scapulars. Tertiaries and innermost primaries missing, presumably moulted, but remaining middle and (black) outer primaries have characteristic prominent white border. Legs rather bright in this individual. Note also strong-looking bill which appears relatively short and deep based. Moulting to winter head pattern has just begun, as indicated by pale flecks in crown.

**224** Little Tern / Dwergstern *Sternula albifrons*, adult summer, Eilat, Israel, 30 March 2008 (*James Kennerley*). This bird has head pattern that precludes Saunders's Tern *S saundersi* but note that here it has been exaggerated somewhat by viewing angle.

**225** Little Tern / Dwergstern *Sternula albifrons*, adult summer, Kalba, Sharjah, United Arab Emirates, 9 May 2009 (*Tommy Pedersen*). Field appearance of Little varies greatly depending on posture and ambient light. However, note rather dark grey upperparts and that any white border along upper edge of folded primaries is very thin and well-defined, whilst darker outer primaries are not very black. Exact shape of forehead patch is also variable (and prone to change, depending on angle of head) but it generally extends to at least above front edge of eye (plate 225) if not beyond this point (plate 224 and 226). See plate 227 and 236-237 for examples of Little with forehead patch close or extremely close to that typical of Saunders's Tern *S saundersi*. Legs rather bright, almost reddish-orange.



**226** Little Tern / Dwergstern *Sternula albifrons*, adult summer, Kalba, Sharjah, United Arab Emirates, 25 May 2011 (Tommy Pedersen). Even through exact position of eye is difficult to determine, note obvious extension of white from forehead patch. Thin, well-defined white trailing edge to secondaries obvious here, whilst primaries are uniform grey, lacking Saunders's Tern *S. saundersi* usually quite prominent white edges. Exposed rump clearly whiter than lower back.

**227** Little Terns / Dwergsterns *Sternula albifrons*, adult summer, Haifa, Israel, 17 April 2020 (Itay Berger). Note that in some Little white forehead patch does not continue back in narrow point to above eye (see left bird) and hence extent is not very different from Saunders's Tern *S. saundersi*. Note also rather strong grey upperparts, slightly darker than in Saunders's, with distinct but thin white border to folded primaries.





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**228-229** Little Tern / Dwergstern *Sternula albifrons* adult summer, Kilcoole, Wicklow, Ireland, 22 July 2021 (Killian Mullarney). **230-231** Little Tern / Dwergstern *Sternula albifrons* adult summer, Kilcoole, Wicklow, Ireland, 22 July 2021 (Killian Mullarney). These plates, featuring two different individuals but each portraying two consecutive images of same individual bird, demonstrate how photographs of bird with perfectly 'normal' wing pattern (left), in which secondaries are narrowly tipped white can, split-second later, appear to have much more extensive white on secondaries (right). This is apparently due to whitish inner webs of these feathers being momentarily revealed when actively flexing wing is viewed from certain angles. Importantly, slightly darker shade of grey upperparts in Little presents greater contrast with exposed white areas than is typically the case with Saunders's Tern *S. saundersi*, in which distinction between pale grey and whitish is more diffuse.

blackish. Little has a notoriously complex moult regime and it is not unusual for there to be three 'waves' or generations of primaries simultaneously, the outermost being the oldest and darkest (see plate 265). Saunders's moult is less well documented and, in view of the likelihood that published accounts of moult may to some extent have been based on examination of misidentified Little, we suggest that some reappraisal may be needed. However, the established on-average greater number of black (old) primaries in Saunders's than in Little is a useful aid to identification in summer adults, although there are ex-

ceptions to the rule, with Saunders's occasionally having as few as two black primaries (plate 233). The supposedly diagnostic blacker primary shafts of Saunders's, from which its old vernacular name 'Black-shafted Ternlet' was derived, used to be regarded as an important means of distinguishing (the then subspecies) *saundersi* from the subspecies *pusilla* (from India; now often synonymised with *sinensis*), then known as 'White-shafted Ternlet'. Whilst this difference may be useful when looking at birds in the hand, or museum specimens, we consider it to be of limited use in the field, or when looking at photographs, when



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**232** Little Tern / Dwergstern *Sternula albifrons* adult summer, Kilcoole, Wicklow, Ireland, 22 July 2021 (*Killian Mullarney*). In the field, secondaries of adult Little generally appear grey with thin white tips forming distinct trailing edge; however, photographs often capture detail that is difficult to see in life, such as a subtle 'Venetian blind'-like pattern on this bird's secondaries. In-hand examination of secondaries (or see <https://tinyurl.com/mry542v9>) would reveal that the portion that is grey, and visible on upper surface, is actually quite limited, being a narrow longitudinal stripe on outer part of feather. Whitish inner portions of feathers mostly concealed by overlap but can be partially visible, as depicted here.

**233** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, adult summer, Abu Dhabi offshore Islands, United Arab Emirates, 16 March 2013 (*Oscar Campbell*). Individual with just two black outer primaries and what appears to be some white coming through on shaft of outermost. Only leading edge of upperwing is exposed to direct light; in slight shadow over remainder, impression is of rather even pale grey tone but note lack of Little Tern's *S. albifrons* distinct narrow white trailing edge. Blackish primary shafts have traditionally been much-quoted field character of Saunders's (versus white on Little). It is not certain whether primary shafts genuinely are white or if this is just light reflecting off shaft but we suspect the latter; in another photograph of same bird showing right wing on upstroke, there is no hint of white shafts. See also plate 217.

**234** Little Tern / Dwergstern *Sternula albifrons*, adult summer, Khwar Dhurf, Oman, 14 June 2015 (*Tommy Pedersen*). Note thin but well-defined trailing edge on grey secondaries, rather dark grey upperparts and obviously paler rump and tail, offering marked contrast.

**235** Little Tern / Dwergstern *Sternula albifrons*, adult summer, Kalba, Sharjah, United Arab Emirates, 9 May 2009 (*Tommy Pedersen*). Another image illustrating details of upperwing pattern. Whilst secondaries have thin but neatly defined white trailing edge, tips of primaries are essentially devoid of white.



**236** Little Terns / Dwergsterns *Sternula albifrons*, presumed second calendar-year (left) and adult summer (right) Kalba, Sharjah, United Arab Emirates, 9 May 2009 (Tommy Pedersen). Adult bird is good representation of kind of Little that, applying traditional criteria, can rather easily be made to 'fit' Saunders's Tern *S. saundersi*. In addition to extensive black on outer wing, it has suggestion of grey extending down middle of rump, primary shafts appear to be black and white does not seem to extend prominently over eye. As well as some Saunders's appearing to have pale primary shafts (see plate 217 and 233), some Little can appear to lack white shafts! Regardless of the above, secondary pattern eliminates Saunders's. Even on a soft image such as this, the identity of presumed second calendar-year bird (left) as Little can be determined on its rather dark grey upperparts, mainly greyish secondaries and inner primaries and relatively pale grey outer primaries. **237** Little Tern / Dwergstern *Sternula albifrons*, adult summer, Kuala Baram, Sarawak, Malaysia, 25 July 2021 (Dave Bakewell). With white forehead patch clearly stopping short of eye, this bird's head pattern appears indistinguishable from Saunders's Tern *S. saundersi*. In addition, bill appears quite deep based. Could it be Saunders's? Ambiguous secondary pattern, rump colour and overall tone of upperparts in this heavily cropped image are of limited use in establishing identity of this interesting bird but not so dark outer primaries (with seemingly prominent white shafts) and apparently bright leg colour strongly suggest that it is Little.

sunlight catching the waxy sheaths of the feather shafts may be mistaken for pale shafts (plate 217, 233; see also discussion in caption of plate 236 concerning Little Tern where white primary shafts are not evident).

#### Upperparts

Under optimum lighting conditions, the upperparts of Saunders's Tern are a paler shade of grey than Little Tern (plate 221 and 239). The difference can be apparent in direct comparison but is less easily determined on single birds, especially in the glare of tropical sunshine. The tone of Saunders's upperparts is a clean pale grey, lacking the leaden or slightly blue tinge typical of Little (plate 224-232 and 234-235). The overall effect on Saunders's, especially in high flight in bright sun, is of a strikingly pallid tern with more strongly contrasting black outer primaries than on Little. The very pale grey of the mantle and back extends fairly evenly to the rump, so Saunders's lacks the usually rather well-defined cut-off between grey upperparts and white rump and tail in Little (compare plate 218-219 with plate 228-232 and 234-235). According to Olsen & Larsson (1995),

'populations [of Little] from the Persian Gulf often have a grey rump and tail' though it is not clear whether this statement refers to adults in summer plumage or birds in winter plumage. It is certainly the case in winter but it does not seem to be very common for adults in summer plumage to show significant grey extending onto the rump. However, our observations indicate that in western Europe some essentially summer-plumaged Little, perhaps especially towards the end of the breeding season, may show rather uneven greyish shading to the centre of the rump and tail. Further, observations in the UAE indicate that at least some advanced second calendar-year Little in spring and summer exhibit a pale grey wash to the rump and tail, presenting limited contrast with the upperparts and hence an effect not dissimilar to adult Saunders's. However, such birds are readily identifiable as Little based on, eg, detailed examination of the secondaries and head pattern.

#### Head pattern

The different head patterns of summer-plumaged Saunders's Terns and Little Terns have been well described elsewhere, and the useful rule of



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**238** Saunders's Terns / Saunders' Dwergsterns *Sternula saundersi*, summer plumage (left and right) with Little Tern / Dwergstern *S. albigrons* (centre), Lulu Island, Abu Dhabi, United Arab Emirates, 19 March 2021 (*Ted Burkett*). Dull legs of Little suggest it is second calendar-year, a hypothesis supported by incomplete loreal stripe. As here, Saunders's may appear proportionately large headed compared with Little.

**239** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, summer plumage (left) with two Little Terns / Dwergsterns *S. albigrons* (centre and right), second calendar-year, Lulu Island, Abu Dhabi, United Arab Emirates, 11 May 2021 (*Ted Burkett*). Note subtle difference in tone of grey upperparts (slightly paler in Saunders's). Due to age of both Little, there is no discernible difference in leg colour between both species in this image.

thumb with regard to the eye being situated within the black cap (Saunders's) versus within the black loreal stripe (Little) remains reliable (eg, van Duivendijk 2010). Caution must be exercised with regard to viewing angle and account taken of minor individual variations, as, on occasion, at least some Saunders's can exhibit a pattern more reminiscent of Little, and vice versa. The extent of the forehead patch with respect to the eye is most reliably judged in profile, though in practice, it can be difficult to locate the precise position of the dark eye within the black cap. When there is no obvious highlight indicating its

position, it is often possible to detect at least a hint of a discontinuity in the lower edge of the black cap where the white lower 'eyelid' disrupts the otherwise even demarcation line. This may be evident in images, even of birds in flight, or at a distance. Note that when a Saunders's is viewed from an angle where the head is turned toward the observer, even a perfectly typical white forehead patch may appear to have a pointed extension extending to over the eye, or thereabouts (plate 221). At the opposite end of variation, some Saunders's can show a smaller than usual white forehead patch, such that very limited

white is evident in side profile, especially if the head is turned slightly away. In some birds, the black loreal stripe is very wide, enhancing the impression of the head pattern being clearly 'different' from Little, but there seems to be too much overlap in the width of the loreal stripe for it to be regarded as a reliable identification character, except perhaps when looking at the more extreme examples. The extent of the loreal stripe is known to differ slightly between the sexes in Little (on average wider in males; Nadler 1976 cited in Cramp 1985, Demongin 2016). According to Olsen & Larsson (1995), there is a similar difference between the sexes in Saunders's too, with male Saunders's having a slightly broader stripe than male Little.

In summary, while the distinctive head pattern is usually reliable, in circumstances where Little Tern is much more the expected of the two species, it is advisable not to place too much reliance on head pattern alone. Little can occasionally lack the rear-pointing extension of the forehead patch such that, in profile, it barely differs in extent from that of typical Saunders's Tern (plate 227 and 237).

#### *Bill structure*

In adult summer birds especially, the bill of Saunders's Tern sometimes looks proportionately heavier and perhaps fractionally shorter than in Little Tern (plate 223 and 267). Data presented by Olsen & Larsson (1995) indicate a slightly deeper base and marginally shorter length in Saunders's but given the slightly smaller overall size of Saunders's, the relative difference in bill size may have more to do with the difference in overall body size between the two species. Again, the possibility that published measurements of Saunders's may to some extent be based on misidentified Little skins needs to be borne in mind. In any case, while Saunders's can appear to have a proportionately heavier bill than Little, there is often no obvious difference in the field.

#### *Leg colour and length*

The legs of Saunders's Tern in summer are consistently duller, more brownish- or olive-yellow than the legs of Little Tern, which are brighter and more orange in colour (compare plate 221-222 with plate 224 and 227). This has been well described in the literature and recent observations in the UAE of both species in mixed flocks confirm that differences in leg colour can be striking and reliable on summer-plumaged adults. We are not aware of any case of Saunders's ever having bright yellow-orange legs (although see plate

223). Since the legs become darker in the winter in both species, leg colour difference is less reliable toward the beginning and end of the summer season. It must be borne in mind that some second calendar-year Little, that superficially resemble summer adults, may exhibit duller, more olive-coloured legs, effectively indistinguishable in colour from that of summer adult Saunders's (see plate 238-239).

Leg length may sometimes appear fractionally longer on Little Tern but, as with bill structure, individual variation means that differences may only be obvious in extreme cases.

### **Juvenile**

#### *Upperwing pattern*

In general, the very limited treatments of juvenile plumage of Saunders's Tern in the literature suggest that Saunders's is inseparable from Little Tern in this plumage (eg. Olsen & Larsson 1995). It was therefore a surprise to discover that the distinctive white triangular area on the rear wing seen in adult summer Saunders's is also evident in juvenile plumage. In fact, due to the whiter inner primaries and perhaps the more variegated markings within the juvenile wing-coverts and scapulars, the white on the rear wing is even more prominent in juvenile than in adult summer Saunders's (plate 216 and 244-245). Juvenile Little can appear to have a diffuse whitish rear wing (see plate 249-251), and when viewed (or photographed) at a distance or in strong light, the secondaries and inner primaries are prone to appearing unmarked whitish (plate 251), in the same way that juvenile Arctic Tern *S paradisaea* can appear to have all-white secondaries. However, viewed at close range, Little shows a less pronounced paler panel on the rear wing than Saunders's, and close views or photographs invariably reveal distinct grey centres to white-tipped secondaries and greater coverts to give the wing a plainer appearance, with a more or less distinct secondary bar (plate 248 and 252). Juvenile Little does not have as dark grey outer primaries as Saunders's, further reducing the impression of a Sabine's Gull-like wing pattern seen in juvenile Saunders's. The reference in Olsen & Larsson (1995) to some juvenile Saunders's (in Bahrain) having a darker bar on the secondaries than Little now seems completely erroneous and is probably based on what we consider to be a misidentified Little, depicted in plate 166 of that book, photographed in Bahrain.

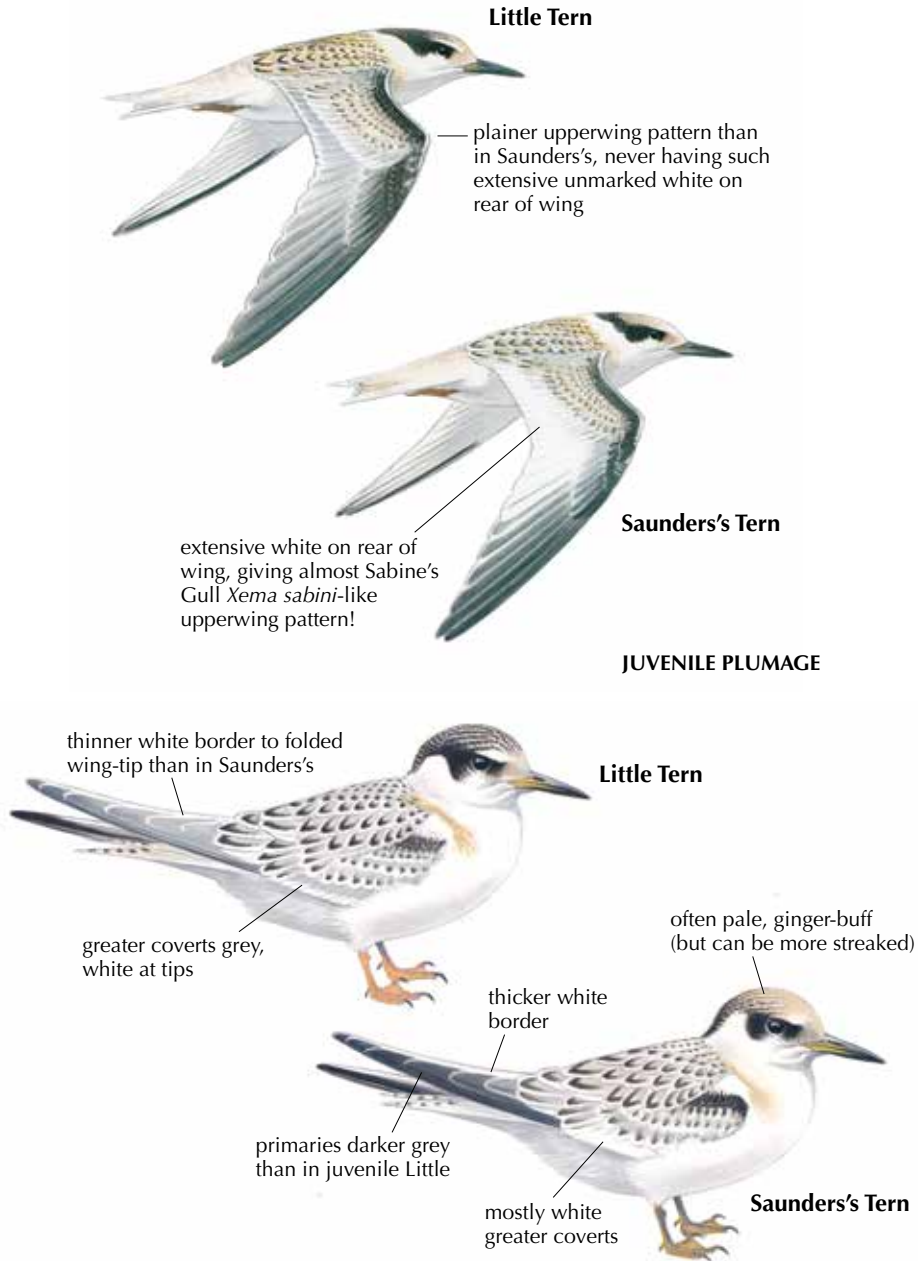


FIGURE 2 Salient identification features of juvenile Saunders's Tern / Saunders' Dwergstern *Sternula saundersi* and Little Tern / Dwergstern *S. albitrons* (Killian Mullarney)





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**240** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, juvenile, Umm al-Quwain, United Arab Emirates, 29 May 2021 (*Stephen Taylor*). Very pale bird with almost white crown and weakly marked upperparts that we have not observed in juvenile Little Tern *S. albifrons*. Note prominent white border to rather dark folded primaries and uniformly pale greater coverts, lacking greyer base/whiter tips usually seen in Little.

**241-242** Saunders's Terns / Saunders' Dwergstern *Sternula saundersi*, juveniles, Emirates Palace, Abu Dhabi, United Arab Emirates, 22 May 2021 (*Oscar Campbell*). Note streaked crown and more pronounced upperpart markings than plate 240, similar to many juvenile Little Terns *S. albifrons*, as well as rather dark slate-grey folded primaries with prominent white border. Post-juvenile moult of upperpart feathers (but not crown) already evident in individual in plate 241.

**243** Little Tern / Dwergstern *Sternula albifrons*, juvenile, Kuala Baran, Sarawak, Malaysia, 24 September 2020 (*Dave Bakewell*). Note rather pale, greyish folded primaries, and subtly two-toned greater coverts. Short but distinct white eyebrow stands out against extensively dark crown, nape and ear-coverts.



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**244** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, juvenile, Emirates Palace, Abu Dhabi, United Arab Emirates, 22 May 2021 (*Oscar Campbell*). Note striking wing pattern with unmarked white secondaries, inner primaries and greater coverts forming conspicuously white panel on rear of wing, contrasting with dark outer primaries and leading edge. This individual has very pale head, with black nape shawl only weakly connected to ear covert spot.

**245** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, juvenile, Emirates Palace, Abu Dhabi, United Arab Emirates, 22 May 2021 (*Oscar Campbell*)

**246** Little Terns / Dwergsterns *Sternula albifrons*, very recently fledged juveniles, Portrane, Dublin, Ireland, 14 July 2021 (*Killian Mullarney*). At rest, especially, very similar to juvenile Saunders's Tern *S. saundersi*. Typically, Little has more heavily mottled crown (that does not change rapidly to white, as in Saunders's), paler grey primaries with distinct but comparatively thin white border and subtly two-toned greater coverts.



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**247** Little Tern / Dwergstern *Sternula albifrons*, juvenile, Kilcoole, Wicklow, Ireland, 22 July 2021 (*Killian Mullarney*). In all juvenile terns, apparent tone of upper surface of remiges can change quite significantly depending on light direction and intensity, as well as plane of wing with respect to observer. This well-exposed image, in good light, shows more even tone of entire surface of upperwing typical of juvenile Little, with not so dark outer primaries, nor contrastingly white secondaries, inner primaries and greater coverts as in Saunders's Tern *S. saundersi*. Overall impression very different to that exhibited by juvenile Saunders's, although differences are not always so obvious in field views.

**248** Little Tern / Dwergstern *Sternula albifrons*, juvenile, Kilcoole, Wicklow, Ireland, 22 July 2021 (*Killian Mullarney*). Grey inner primaries, secondaries and greater coverts all contribute to rather evenly grey-toned upperwing, lacking 'Sabine's Gull *Xema sabini*'-like pattern characteristic of Saunders's Tern *S. saundersi*.

**249-250** Little Tern / Dwergstern *Sternula albifrons*, juvenile, Portrane, Dublin, Ireland, 14 July 2021 (*Killian Mullarney*). These plates of same bird at not so high resolution illustrate how Little can appear to have quite whitish-looking rear wing, suggestive of Saunders's Tern *S. saundersi*. However, close inspection shows that secondaries, inner primaries and greater coverts are mainly pale grey, rather than white.



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**251** Little Terns / Dwergsterns *Sternula albifrons*, mainly juveniles, Kilcoole, Wicklow, Ireland, 22 July 2021 (Killian Mullarney). Here, as quite often in the field, rear of wings are paler than leading edge but contrast is much less than in Saunders's Tern *S. saundersi*.

**252** Little Tern / Dwergstern *Sternula albifrons*, juvenile, Lesvos, Greece, 10 August 2016 (Killian Mullarney). Our observations suggest that field appearance of juvenile Little is consistent across Europe. Distinctly greyish secondaries with fine white trailing edge and well-defined white eyebrow are characters that serve to eliminate Saunders's Tern *S. saundersi*.

#### Folded wing

At rest, when it is not possible to determine the pattern of the open wing, the two species are more similar. However, Saunders's Tern has a tendency to show broader white tips to the greater coverts (indeed, the outer greater coverts may appear to be completely white) and, mirroring the pattern exhibited by adults (see above), a thicker white border to the folded primary tips (plate 240-242). This gives a more strongly contrasting three-toned (white, grey, blackish) wing than in juvenile Little Tern.

#### Head

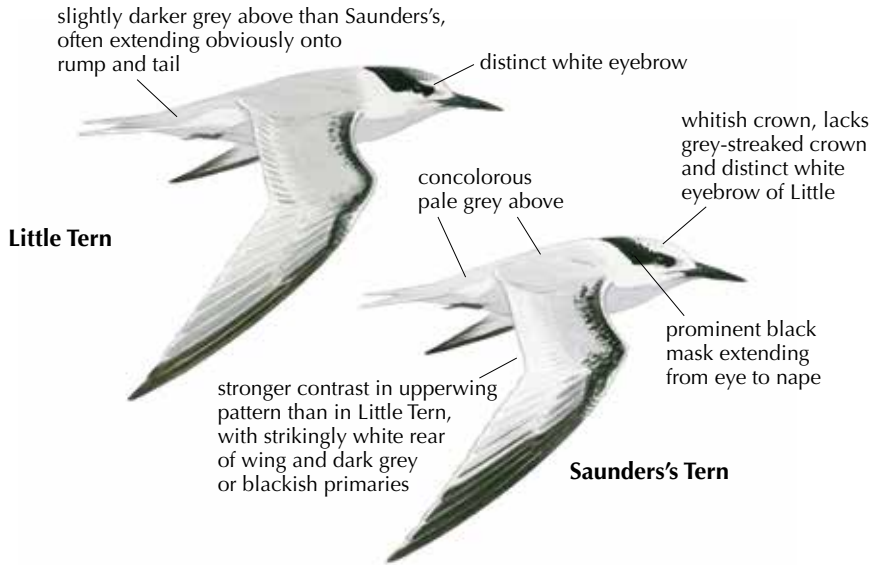
The crown of juvenile Saunders's Tern is often paler, ginger-buff washed or more whitish than in Little Tern, and, even on many recently fledged individuals, the nape and ear-coverts appear contrastingly dark and somewhat disconnected (plate 240 and 244), compared with the more solid uniformly dark mask, rear crown and nape of Little (plate 243 and 246). As in winter-plumaged

adults, juvenile Little frequently show a short, well-defined white eyebrow (plate 243, 247 and 252). With the onset of post-juvenile moult, the crown becomes almost entirely white, emphasising a bold blackish mask and giving Saunders's a highly characteristic appearance that persists into winter. This impression may be apparent as early as late May in the UAE (see plate 240), where Saunders's typically breeds several months earlier than birds in Sinai, Egypt (Habib 2016).

#### Leg colour

Some juvenile Saunders's Tern, at least in the UAE, appear to have somewhat darker, less yellowish or fleshy-tinged legs than Little Tern. There are exceptions however, and we have seen images from both the UAE and western India of juvenile Saunders's with conspicuously pale, yellow-tinged legs, so this feature is weakly supportive at best. Of course, in both species the legs tend to be duller and darker in winter.

Identification of Saunders's Tern and Little Tern, with special emphasis on juvenile and winter plumages



**WINTER PLUMAGE**

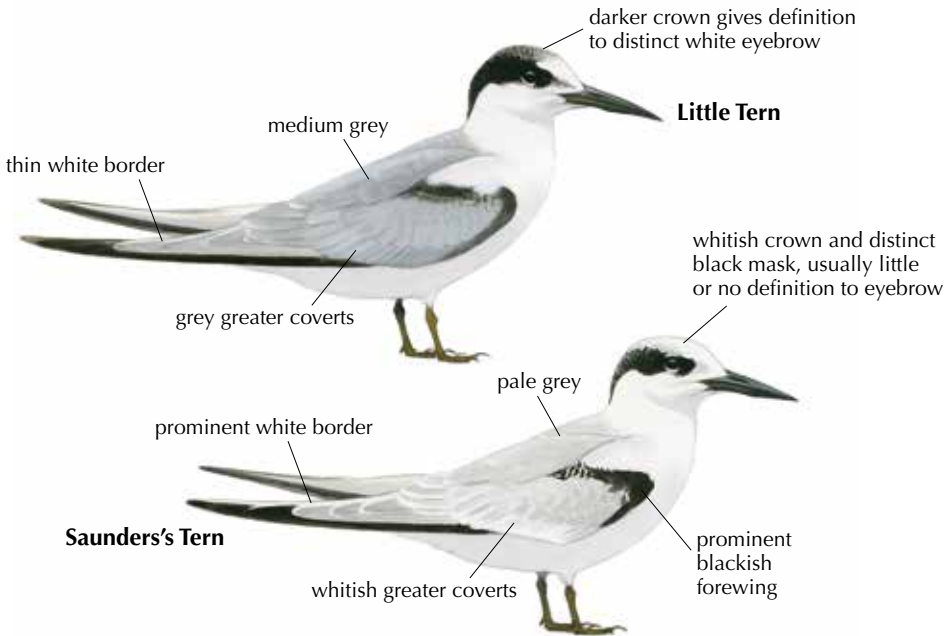


FIGURE 3 Salient identification features of winter-plumaged Saunders's Tern / Saunders' Dwergstern *Sternula saundersi* and Little Tern / Dwergstern *S. albifrons* (Killian Mullaney)

### **Winter plumage**

The most surprising result of this research has been the discovery that, as in juvenile plumage (see above), and contrary to what has always been believed, Saunders's Tern is actually quite a distinctive bird in winter plumage and is readily separated from Little Tern. The other more personal 'surprise' that coincided with this discovery – which we suspect will be something that we have in common with many other birders – was the realisation that, having reidentified all the 'Saunders's' we thought we had seen in the UAE and Oman in winter as Little, neither of us has actually seen a Saunders's Tern in winter plumage! The following account is therefore based entirely on our analysis of as many photographs of birds in winter plumage as we have been able to source, although the comparisons with Little are based on field experience of that species in winter, supplemented with scrutiny of numerous photographs. Whilst we have tried to ensure that all statements relating to the identification of Saunders's in winter will withstand extensive field testing, we welcome corrections, refinements or clarification of any aspects we may have unintentionally misrepresented, especially if they are based on the kind of first-hand field experience we have not yet had of Saunders's in winter.

The most useful identifying features of Saunders's Tern in winter plumage relate to the upperwing pattern in flight, the overall tone of the upperparts (especially the rump and tail), the head pattern and finally, the prominence of the white border to the folded primary tips. Note that most of the comments below apply to both adult winter and first-winter Saunders's, the latter being equally distinctive (see plate 254-256).

#### *Upperwing pattern*

Having established that Saunders's Terns have whiter secondaries than their Little Tern counterparts in both adult summer plumage and juvenile plumage (see above), it stands to reason that this difference should apply to birds in winter plumage too. In winter Saunders's, the secondaries and inner primaries are even more obviously whitish than they are in summer, and the strong contrast with the blackish outer primaries and often extensive blackish markings along the 'arm' create a bold tricolour pattern (plate 253, 257 and 260), bringing to mind the upperwing of a juvenile Black-legged Kittiwake *Rissa tridactyla* (rather than the somewhat more Sabine's Gull-like upperwing of adult summer and juvenile Saunders's, due to the lack of dark on the 'arm'). Little in win-

ter has a superficially similar wing pattern but it lacks the clean, crisp contrast of Saunders's (plate 263 and 266). This is due to the 'old' outer primaries (which may number up to five, depending on age or the extent of moult) tending to look a duller grey- or brownish-black (rather than black), any dark on the upperwing-coverts tending to be less black and often less extensive than in Saunders's and, especially, the secondaries being less whitish. Our examination of photographs supports a feature alluded to by Carter & McAllan (2007), that in Saunders's even the freshly moulted outermost primaries are already quite dark (plate 253) with a steely grey tone to their upper surface. If this can be confirmed through more critical study of birds actively moulting their outer primaries, it could explain why the worn primaries of Saunders's look distinctly blacker than similarly worn primaries in Little.

Some Little Terns in winter show somewhat ragged white patches, or Venetian blind-like thin light-and-dark streaks in the secondary area of the open wing (eg, plate 264). We are unaware of Saunders's Tern ever showing such a pattern. While a precise explanation for these features, and why they are apparent in some birds but not in others, is not entirely clear to us, at their most prominent they seem to be associated with active moult and perhaps feather wear. Importantly however, the darker grey upperwing-coverts of Little tend to contrast more strongly with these irregular patches of white than the softer contrast between pearl-grey and whitish seen in Saunders's. Little with white patches in the secondaries lack the clean tricolour pattern seen in Saunders's and these patches do not extend to the primaries, presumably because these inner primaries are replaced more often than the secondaries and retain their fresh grey tone throughout the winter. Note that, whilst seemingly somewhat more frequent in winter plumage, we have documented some summer-plumaged Little with a similar secondary pattern (see plate 232).

It is important to note that the on average different number of dark primaries in summer plumage (greater in Saunders's Tern, as described above) does not apply in the winter months when both species are in active primary moult and it is not unusual to see up to five older, darker primaries in Little Tern.

#### *Upperparts*

On Saunders's Tern, the tone of the upperparts does not change in winter so, alongside Little Tern, Saunders's looks a slightly paler shade of



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**253** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, winter plumage, Bird Island, Seychelles, 2 December 2011 (*Stewart Smyth*). Note single retained worn outermost primary on both wings. With moult of remiges nearing completion by early December, this bird is likely to be adult. Note that renewed outer primaries are much darker than similarly aged outer primaries would be expected to be on adult winter Little Tern *S. albigrons* in December. In addition, note distinctive white crown and secondaries, typical of winter-plumaged Saunders's, and 'soft' contrast between pale grey tones and white on upperwing.

**254** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, first-winter, Bird Island, Seychelles, 27 November 2010 (*Stewart Smyth*). Ageing as first-winter based on all primaries being retained juvenile and extremely worn secondaries (down to shaft). Strikingly pale impression with contrastingly dark outer primaries and narrow head band is quite different from that presented by Little Tern *S. albigrons*. Further, note big-headed, short-tailed appearance, an impression seldom exhibited by Little.

**255** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, first-winter, Kalba, Sharjah, United Arab Emirates, 2 October 2019 (*Reza Khan*). Bird with very worn, largely juvenile wings. Pale border to very dark primaries has virtually disappeared through wear, while juvenile greater coverts are worn to shaft. Note strikingly white crown, rather pale grey upperparts and contrastingly dark lesser coverts and carpal area. Bill appears comparatively heavy. This image is only one we have seen of Saunders's on Arabian peninsula outside period late February-August.

**256** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, juvenile moulting to first-winter, Umm al-Quwain, United Arab Emirates, 7 July 2020 (*Stephen Taylor*). Note extensively white crown, rather pale grey upperparts, whitish greater coverts and prominent white border to folded primaries.



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**257** Saunders's Terns / Saunders' Dwergsterns *Sternula saundersi*, winter plumage, Banc Derrick, Farquhar, Seychelles, 23 December 2020 (Matthew Morgan/Island Conservation Society). Field impression of group of five birds in flight. Note striking and consistent head and wing patterns exhibited by all birds.

**258** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, adult moulting to winter plumage, Umm al-Quwain, United Arab Emirates, 7 July 2020 (Stephen Taylor). Moulting of head feathers, leading to characteristic white-crowned head pattern evident as early as July. Note also very black-and-white folded primaries.



grey. The difference in tone can be quite striking in good light conditions (see plate 267-268) but, as is always the case when assessing subtle differences in shades of grey, intense sunlight can easily obliterate the difference between the two species. At least in the Middle East and eastern Africa, many Little acquire a rather strong grey colour on the rump and tail in winter (plate 263-265), these areas appearing uniform in tone with the grey of the mantle and upperwing, which often appears strikingly dark, deep grey (plate 261-262). Contrary to much popular literature, we are unaware of any cases of Saunders's ever looking as dark, leaden-grey on the wings, 'back' and rump as in Little. It is important to note that, whilst this difference holds in all regions where Little and Saunders's might be expected to routinely overlap in range, the difference in upperparts tone may not apply to all populations of Little. For example, many photographs of Little in Australia (presumably involving the subspecies

*S. a. sinensis*) show winter-plumaged birds with seemingly very pale grey upperparts; it may be that Saunders's in direct comparison with such birds would not appear obviously paler.

#### Head

In winter, the head markings of Saunders's Tern recall those of the considerably larger Black-naped Tern; the dominant feature on an otherwise white head is a wedge of black, starting just in front of the eye and continuing all the way to the nape, where it is widest, and the two sides meet. Above this black stripe, the crown is ostensibly all white, or whitish, often with some weak grey mottling toward the rear crown only, and mostly at the sides (plate 253-257 and 259-260). This pale-crowned appearance may develop as early as mid-summer (plate 258). Winter Little Terns typically appear markedly different, showing a darker crown, mottled or streaked greyish and broadly similar in extent to the black crown of





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**259** Saunders's Terns / Saunders' Dwergsterns *Sternula saundersi*, winter plumage, Bird Island, Seychelles, 1 December 2010 (Stewart Smyth) **260** Saunders's Terns / Saunders' Dwergsterns *Sternula saundersi*, winter plumage, Bird Island, Seychelles, 27 November 2010 (Stewart Smyth). Field impression of winter-plumaged birds. Note consistency of head pattern, with extensive white crown and very pale rear wings, with contrasting very dark leading edge and outer primaries. Left-most standing bird in plate 260 shows somewhat limited black mask.

summer plumage. Most importantly, the darker crown of Little gives definition to a distinct white eyebrow, echoing the diagnostic head pattern of adult summer plumage, although often not appearing to extend quite so prominently over the eye (plate 261-264). Even in Little that have a whiter crown (variation that seems to occur more frequently in Australia) there appears to always be some darker definition bordering the upper edge of this short whitish eyebrow. Most Saunders's lack a distinct pale eyebrow but when they do show this feature it is generally much less well defined and, if visible at all, is seemingly always located just forward of the eye, again corresponding with the rearmost extent of the white forehead in summer plumage.

On at least some Saunders's Terns, the mask around the eye is particularly reduced, so that the eye itself may stand out quite prominently on the head (see plate 260). We are uncertain as to whether this feature is related to age, excessive wear or possibly even the opposite (broad white tips concealing black at the base) but, in any case, it seems that only a minority of winter Saunders's are extremely white headed. We are unaware of Western Palearctic Little Terns ever having such a white-headed appearance but, as mentioned above, we have noticed a greater tendency for Little photographed in Australia to be similar in this respect.



FIGURE 4 Little Tern / Dwergstern *S. albigrons* (left) and Saunders's Tern / Saunders' Dwergstern *Sternula saundersi* (right) in winter plumage (Killian Mullarney). Note overall paler appearance of Saunders's, with whiter crown, indistinct white eyebrow, more prominent white border to folded primaries and whitish greater coverts.

#### Folded wing

At rest, when the full extent of the distinctive upperwing pattern of Saunders's Tern is not visible, the more blackish outermost primaries stand out against the pale grey tertials and whitish greater coverts. Many show a prominent, blackish area on the lesser coverts/carpal area (somewhat akin to winter-plumaged Sanderling *Calidris alba*), further emphasising the paleness of the wing-coverts. The distinct white border to the upper edge of the folded primaries is more prominent in winter plumage than in summer and gives the primaries a three-toned appearance that can be detected at long range. In comparison, the folded wing of Little Tern is more uniform with less contrasting outer primaries, usually less dark on the lesser coverts/carpal, darker grey median and, especially, greater coverts and a distinctly narrower white border to folded primaries.

#### Issue of Least Tern

Whilst on geographical grounds alone, there would appear to be minimal likelihood of an observer ever having to decide whether a bird is a Least Tern *S. antillarum* or a Saunders's Tern, the apparently greater similarity between the two species in juvenile and winter plumages than between Saunders's and Little Tern is interesting, and we feel warrants a brief mention here. Neither of us is particularly familiar with Least but scanning the numerous images of Least in winter and juvenile plumage available on eBird reveals a surprising similarity to Saunders's. Like Saunders's, juvenile and winter-plumaged Least tend to have a more contrasting upperwing pat-

tern, with an extensive area of unmarked white or whitish on the rear of the wing, darker outer primaries and, in winter, a dark carpal bar. In winter plumage, Least also tends to have a head pattern that resembles Saunders's more than Little, albeit with a greater incidence of birds that have a suggestion of a white eyebrow, like Little. Least seems not to show the broader white border to the folded primaries that is characteristic of Saunders's but this feature, like all features alluded to above, appears to exhibit greater variation in Least than seen in Saunders's. A recent groundbreaking paper on the separation of juvenile Least from Little (Rodríguez-Lázaro 2021) reinforces our impression of the very close similarity between juvenile Least and Saunders's. Observers faced with a *Sternula* tern that does not match Little, but where either Least or Saunders's could conceivably occur as a vagrant, will need to investigate this issue carefully.

#### Implications for non-breeding distribution of Saunders's Tern

The hypothesis presented here suggests that a reappraisal of the non-breeding range of Saunders's Tern is required. This species' non-breeding range has traditionally been regarded as very large, from the Persian Gulf and Pakistan southwards along the eastern African coast to Tanzania and through the Indian Ocean to Madagascar (BirdLife International 2021). To the east, the species was first recorded on the Cocos (Keeling) Islands in 2006 and has been reported there annually, mainly from October to March in small numbers (c 10; up to 20 in some years) regularly since



**261** Little Tern / Dwergstern *Sternula albifrons*, first-winter, Muscat, Oman, 30 October 2013 (Hanne & Jens Eriksen)

**262** Little Tern / Dwergstern *Sternula albifrons*, adult winter, Muscat, Oman, 25 September 2012 (Hanne & Jens Eriksen). Typical appearance of wintering Little in Arabia. Note darkness of upperparts, with uniformly grey greater coverts and lack of prominent white upper edge to folded primaries. In addition, head pattern clearly shows dark rear crown and short but clearly defined white eyebrow.





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**263** Little Tern / Dwergstern *Sternula albifrons*, winter plumage, Hameen Beach, Abu Dhabi, United Arab Emirates, 5 February 2021 (*Oscar Campbell*). Note concolorous leaden-grey upperparts, extending to rump and tail; contrast between grey upperwing and darker outer primaries much less than in Saunders's Tern *S. saundersi*. Note suggestion of white eyebrow even in rather distant views, due to greyish shading on central crown.

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**264** Little Tern / Dwergstern *Sternula albifrons*, winter plumage, Hameen Beach, Abu Dhabi, United Arab Emirates, 5 February 2021 (*Oscar Campbell*). Head pattern clearly differs from that of Saunders's Tern *S. saundersi* in winter plumage. Note 'Venetian blind'-like pattern of alternate grey and white longitudinal stripes on secondaries, a feature seen in minority of Little, especially in winter, but not in Saunders's. Strong grey tone on rump, long erroneously believed to be character of Saunders's, is shown by many Little wintering in Arabian Gulf.

**265** Little Tern / Dwergstern *Sternula albifrons*, adult acquiring summer plumage, Hameen Beach, Abu Dhabi, United Arab Emirates, 5 February 2021 (*Oscar Campbell*). Readily identified as Little on basis of rather uniformly dark, leaden-grey upperside, with thin white trailing edge to secondaries, showing more clearly on left wing. Although details of eyebrow are hard to determine, extent of white forehead is rather greater than is typical of Saunders's Tern *S. saundersi*. It is interesting that this individual still has such grey rump and tail, even when otherwise in nearly full summer plumage. This bird has three generations of primary feathers, with, counting from innermost outwards, p1-4 fresh, p5-8 moderately worn (especially p5) and p9-10 markedly worn.

(Jackett et al 2019; Nigel Jackett in litt) although so far not elsewhere in Australian waters.

Examination of images of *Sternula* terns photographed in the UAE between August and February (images available on eBird; others provided by Tommy Pedersen and Ted Burkett (in litt)), as well as field inspection by OC of over 100 birds wintering in inshore waters around Abu Dhabi island, from December 2020 to February 2021, and flocks of up to 100 elsewhere in the Persian Gulf and Gulf of Oman waters of the UAE from September 2021 onwards, have failed to produce any birds convincingly identifiable as Saunders's Tern based on the characters proposed in this paper. Indeed, all birds that could be examined sufficiently closely proved to be Little Terns, as did most of those present in March and April as well. This raises the possibility that the majority of Saunders's, if not all, depart from UAE coastal waters after the completion of breeding and are generally absent from August/September until late February/March. White-cheeked Terns *S. repressa* and Bridled Terns *Onychoprion anaethetus*, both of which breed commonly in UAE waters of the Persian Gulf, are similarly absent after completion of breeding, from September (to March and late April, respectively). A general scarcity, possibly a complete absence of Saunders's during winter from at least the central Red Sea coastline of Saudi Arabia during that season was suggested by Brian James (in litt) and for Bahrain was implied by Hirschfeld (1995), who recorded a marked peak in numbers in August-September, although it is not clear how the birds involved in these records were distinguished from Little. Analysis of *Sternula* records made by OC (not recorded to species, as birds were invariably distant and in flight) at one intertidal site on the southwestern corner of Abu Dhabi Island from 2010-19 failed to detect a comparable early autumn peak (see figure 5). Instead, numbers were highest in March and October. These data would be consistent with an arrival of Saunders's to breed in March, departing early autumn, and an arrival of Little to overwinter, mainly from October. Of course, passage Little in spring will certainly con-

**266** Little Terns / Dwergsterns *Sternula albifrons*, adult winter and first-calendar years, Kalba, Sharjah, United Arab Emirates, 26 October 2019 (Tommy Pedersen). Right-hand most bird (amongst others) is first-calendar year, with moult limit on inner primaries (p1-3 moulted, p4 half grown, p5-10 juvenile, only slightly darker than when fresh); two adults immediately behind have almost completed replacement of primaries, with much paler grey fresh outer primaries than exhibited by Saunders's Tern *S. saundersi*. Note also that, as exhibited here, not all Little in winter plumage appear distinctly grey rumped.



*Identification of Saunders's Tern and Little Tern, with special emphasis on juvenile and winter plumages*

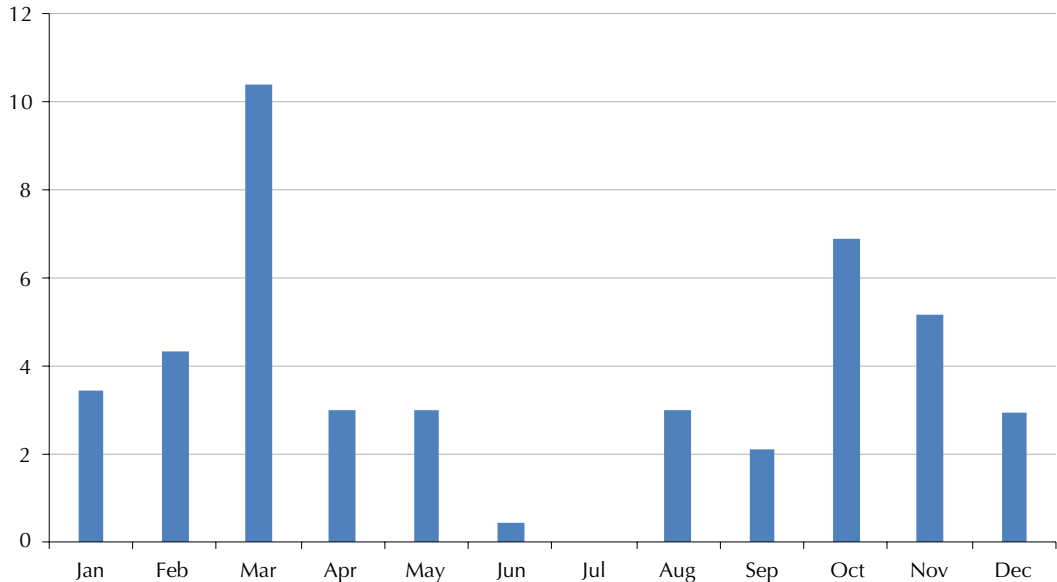


FIGURE 5 Average number of *Sternula* terns per visit per month at one site in south-western corner of Abu Dhabi island, United Arab Emirates, in 2010-19. Due to distance, no attempt was made to identify observed *Sternula* to species. Total number of visits was 235; total number of birds counted 934. Note that only two visits were made in July; all other months had at least six visits. Site used is c 20 km from nearest known Saunders's Tern *S. saundersi* breeding site.

tribute to the March peak as well. Some second calendar-year Little are known to remain on the wintering grounds (Cramp 1985) so it is likely that at least small numbers occur in the Persian Gulf and UAE east coast throughout the summer. Observations from a barrier island immediately offshore to Abu Dhabi island, where *Sternula* are very rare in winter, suggest arrival of summer-plumaged Saunders's from early to mid-March annually, to congregate and display prior to relocation to breeding islands.

Apart from summer-plumaged birds at or near breeding colonies, we have failed to find any convincing examples of Saunders's Tern photographed in Oman, or in Saudi Arabia, although sample sizes for images on eBird are small for the latter country. A visit by OC in early April 2022 to the Al-Birk and Jizan areas of south-west Saudi Arabia, including the Farasan Islands, produced 33 confirmed Little Terns, mainly adults in breeding plumage, out of 45 *Sternula* encountered. Unidentified birds were seen too distantly or briefly to confidently establish their identity but none were strongly suspected to be Saunders's, and behaviour suggested all were migrants rather than local breeders. Both Porter & Aspinall (2010) and Boland & Alsuhaibany (2020) imply that

Saunders's should be much more frequent than Little in this area. Images of a flock of *Sternula* terns from Yemen in early March 1982 and a single bird on Socotra in November 2007, assigned at the time to Saunders's, can now be identified as Little Terns, a species not knowingly recorded in either Yemen or Socotra until now (Richard Porter in litt). Of some 50 eBird images from Kenya purporting to be Saunders's, all confidently identifiable to species are Little, some rather obviously so; there has clearly been the presumption (understandable, given treatment in popular field guides, eg, Stevenson & Fanshawe 2002) that Saunders's is the default *Sternula* in coastal East Africa and that Little is rare or perhaps even generally absent there. Further, several images from Tanzania labelled as Saunders's are clearly Little.

Popular field guide treatments for the islands of the western Indian Ocean (eg, Sinclair & Langrand 2013) imply that the default *Sternula* will be Saunders's and that Little Tern is a vagrant to the region. However, eBird images of *Sternula* from Madagascar, where identifiable, appear to be mainly Little, although there is one that is clearly a Saunders's photographed at Nosy Ve, a low-lying coralline islet 4 km off Anakao, south-western



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**267** Little Tern / Dwergstern *Sternula albifrons*, first-winter (left), with moulting Saunders's Tern / Saunders' Dwergstern *S. saundersi*, adult (right), Mappila Bay, Kannur, Kerala, India, 6 August 2020 (*Nishad Eshaal*). Away from breeding colonies, Saunders's is rarely reported from mainland India, although is likely under-recorded. Note paler grey upperparts of Saunders's and contrastingly dark primaries, prominently bordered white along their upper edge. Moulting to winter plumage has begun, as indicated by peppering of white crown feathers, although pattern is still diagnostically closer to that of summer-plumaged Saunders's than to Little. Further, bill on this individual looks slightly shorter and marginally deeper based compared with Little alongside.

**268** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi* (left), and Little Tern / Dwergstern *S. albifrons* (right), Cocos (Keeling) Islands, Australia, 23 March 2019 (*Geof Christie*). Ageing uncertain but both birds are probably second calendar-years. Despite being in transitional plumage, this Saunders's shows suite of features that allow ready separation from Little alongside. Fine details of head pattern differ clearly, grey upperparts are somewhat paler and cleaner and there are obvious elements of white in wing, in particular on greater covert tips and upper edge of folded primaries. Note that we are uncertain of subspecific identify of Little occurring on Cocos Islands but images we have examined, and as apparent here, imply that, as in Middle East, Saunders's average slightly paler and cleaner grey on upperparts than Little occurring alongside.



**269** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, presumed second calendar-year, Abu Dhabi offshore islands, United Arab Emirates, 15 May 2015 (Oscar Campbell) **270** Saunders's Tern / Saunders' Dwergstern *Sternula saundersi*, presumed second calendar-year, Abu Dhabi offshore islands, United Arab Emirates, 5 June 2009 (Oscar Campbell). The small numbers of presumed second calendar-year Saunders's we have studied resemble adults but differ by exhibiting one or more of following features: dark markings on lesser coverts/carpal area, less than fully developed head pattern and larger number of dark outermost primaries. However, at least in birds studied, head pattern still shows no suggestion of white eyebrow characteristic of Little Tern *S. albigrons* in all plumages, folded primaries have obvious white line along upper edge and upperparts lack slightly darker grey tone of Little. We are uncertain if Saunders's moulting in or out of summer plumage could ever temporarily show suggestion of white eyebrow over eye and, further, it is possible that determination of precise secondary pattern on worn second calendar-year birds may be extremely difficult. Thus, it is possible that some second calendar-year birds may require detailed examination before firm identification can be made while others, as these plates show, are fairly distinctive.

Madagascar. Further, we have seen other images confirming the presence of Saunders's in Madagascar (Pete Morris in litt). We have also seen a series of images of Saunders's Terns, alongside both Little and Damara Terns *S. balaenarum*, from coastal shoals of the San Sebastian peninsula, Mozambique where up to 30 birds in a mixed set of breeding, intermediate and winter plumages have been recorded since 2018 (Allport et al 2022). A small sample of images on eBird from the Seychelles include a group of three Little (identified as Saunders's) from Mahe but also several genuine Saunders's, all from Bird Island, a remote coral island 100 km north of Mahe. Additional images of Saunders's from Bird Island by Stewart Smyth, are viewable at [www.payanke.com/gallery/terns/index2.html](http://www.payanke.com/gallery/terns/index2.html). We have also seen images of Saunders's photographed in December 2020 on the remote Farquhar Islands, part of the outer Seychelles but only 290 km north-east of northernmost Madagascar (Matthew Morgan in litt), from Aldabra in February 2021 (Matthew Van Rooyen in litt) and the Cocos Islands in January 2010 (Tony Palliser in litt). However, images of a bird present from December 2021 to April 2022 on La Reunion allow confi-

dent identification as Little Tern, the first confirmed record for the island (Gabriel Caucanas in litt). eBird also has a small sample of images of Saunders's from the Maldives, including a flock of c 50 winter-plumaged birds in December. In India and Sri Lanka, where the identification of Saunders's away from known breeding sites appears to be treated with great caution, we found four convincing photographs (two juveniles, two adults moulting out of summer plumage) of Saunders's in the large sample of Little photographs on eBird. All were from coastal Kerala in August-September. We have since learnt that one of these records, from August 2020 at Mappila bay, Kannur (see plate 267), although at the time of writing still recorded as Little on eBird, has been published as a putative Saunders's, a species not currently on the Kerala state checklist (Chandran 2020; Praveen Jayadevan in litt).

It has not escaped our notice that the foregoing may imply a hitherto unrecognised separation of Saunders's Tern from Little Tern outside the breeding season. Almost all well-documented records of Saunders's outside the breeding season that we have been able to source are from small, generally remote and low-lying sand or coral islands. It



may be that the coral islands of the outer Seychelles are important wintering areas for this species, where it is present mainly from September to April, although recorded in all months except June (Seychelles Bird Records Committee 2021). Up to 1800 have been recorded on St Francois (January), 800 on Aldabra (October) and 380 on Bird Island (December). In contrast, Saunders's appears to be rare or generally absent on larger islands (such as Madagascar) and on continental beaches and intertidal areas (such as eastern Africa and the Arabian peninsula). *Sternula* terns wintering in such habitats seem much more likely to be Little. Overlap between the two species during the winter, as during the breeding season, may be unusual. If this is indeed the case, it would go some way to explaining the long-lasting confusion between two species that we propose are at least as different in winter plumage as they are in summer.

### **Conservation issues**

Saunders's Tern is currently regarded as a species of Least Concern, based on its very large range (BirdLife International 2021) and population believed to exceed 10 000 individuals. In the Arabian peninsula, the species' breeding range extends along the Persian Gulf from Eastern Province, Saudi Arabia, continuing along the coastline of the UAE, very locally through Oman, to the central Red Sea as far north as Yanbu (Jennings 2010, Boland & Alsuhaibany 2020) and, on the African side, from Egypt south to Somalia (BirdLife International 2021). 500 pairs have been estimated for the Socotra archipelago (Porter & Suleman 2014). It breeds fairly commonly along the Iranian coast (Khaleghizadeh et al 2017) to Pakistan, possibly in the Maldives (Rasmussen & Anderton 2012, Anderson & Shimal 2020) and also, very locally, from north-western India to northern Sri Lanka, where birds breeding in mixed colonies with Little Terns have been recently documented (Panagoda et al 2020). The two species also breed in sympatry in Eastern Province, Saudi Arabia, but here they are strictly separated by habitat preference, Saunders's using exclusively marine sites, with Little on fresh or brackish water (Jennings 2010). However, in general, Saunders's is poorly known and what little data are available suggests colonies are scattered and small (often 20 pairs or less). Jennings (2010) estimated the Arabian population to be 4000 pairs but this is mainly based on an autumn report of 11 000 birds at one site in Eastern Province, Saudi Arabia. In light of the present pa-

per, it is unclear how the possibility of Little being present at the same time was discounted. Therefore, it may be that the total population of Saunders's is less than 10 000 individuals. Saunders's is believed to be declining generally (BirdLife International 2021) with increasing disturbance from coastal development. High levels of predation, at least at some colonies, have also been demonstrated (Almalki 2021). It may be that there are indeed large or fairly large populations of wintering Saunders's on Indian Ocean islands such as the Comoros, the Maldives or Lakshadweep and the Nicobars (India), as reported for the outer Seychelles. However, there is no existing evidence to suggest this is the case, although such remote locations are, by definition, under-watched. Records from observers in such locations, as well as those on the coastlines of the Indian Ocean, using the criteria proposed in this paper, should help to further resolve the field characters, winter range and conservation status of this enigmatic and possibly threatened species.

### **Further questions**

Insight into the following issues could be provided by critical examination of wintering *Sternula* tern flocks in Arabia, eastern Africa and western Asia. **1** What is the extent of variation in head pattern in each species? Are winter-plumaged Little Terns ever as pale on the crown as is typical of Saunders's Tern? Similarly, do all Saunders's appear as white headed as our research suggests, or do some individuals show a pattern more similar to Little, perhaps temporarily, as they moult into summer plumage in late winter? **2** Our research for this paper has suggested that there may be subtle differences in bill and head proportions, tail length and leg length between the two species, and indeed some of these have been noticed by Australian observers too. Are these differences sufficiently 'real' to be of practical use, or too subject to individual variation and the vagaries of posture to be of use in identification? **3** Colour of primary shafts (black on Saunders's, white on Little) is an oft-quoted feature. Our research indicates that this feature may be subject to much individual variation (see plate 233 and discussion therein, also plate 217 and 236) and we are aware that it may also vary subspecifically within Little. At any rate, we deem this character difficult to evaluate both in field views and photographs, relative to much more obvious field characters. However, we hope that it may now be possible to fully evaluate the usefulness of primary shaft colour based on birds identified by the characters we

propose in the current paper. **4** Is Saunders's only a vagrant during the non-breeding season on Arabian and eastern African coastlines, or do at least some occur annually during winter amongst much larger numbers of Little? **5** Conversely, along the western Indian coastline, Saunders's is rarely reported away from known breeding sites. Is it genuinely rare there, or is its occurrence simply being overlooked amongst the much larger number of Little? **6** How numerous are Saunders's wintering on Indian Ocean islands such as the Comoros, the Maldives, Lakshadweep and the Nicobars (India)? Wide-ranging surveys of the wintering grounds, by observers armed with up-to-date identification information, could provide valuable information on the global conservation status of the species. **7** As well as the eastern African coastline, our research has produced images of Little from locations such as the Seychelles and Madagascar, where it is regarded as a vagrant. What is the true status of Little at such localities? **8** We have deliberately not incorporated any discussion of vocalisations in this paper, pending more thorough investigation of the subject. We hope that now birds can be more confidently identified in the field by plumage, this will lead to more critical analysis of vocalisations, which in turn may reveal some diagnostic and useful differences. Our preliminary examination of selected recordings of what we consider to be correctly identified Saunders's indicates that the differences between Little and Saunders's may be as distinct as between Little and Least with, as already noted for aspects of juvenile plumage, certain Saunders's vocalisations sounding distinctly closer to Least than Little!

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### **Samenvatting**

HERKENNING VAN SAUNDERS' DWERGSTERN EN DWERGSTERN, MET SPECIALE AANDACHT VOOR JUVENIEL KLEED EN WINTERKLEED Het onderscheid van Saunders' Dwergstern *Sternula saundersi* en Dwergstern *S. albifrons* op het Arabische schiereiland en daarbuiten wordt algemeen beschouwd als moeilijk in volwassen zomerkleed en uiterst moeilijk, zo niet onmogelijk, in andere kleden. In dit artikel wordt een aantal niet eerder beschreven verenkleedkenmerken gepresenteerd, met betrekking tot details van vleugel- en koppatroon, die dienen om Saunders' te herkennen in zowel juveniel als winterkleed. Kenmerken die voorheen werden voorgesteld als criteria voor het herkennen van Saunders' in zomerkleed worden geanalyseerd en op basis daarvan wordt verondersteld dat het voorkomen buiten de broed-

periode aanzienlijk minder uitgebreid is dan tot nu toe werd aangenomen.

## References

- Allport, G, Gilroy, D & Read, C 2022. Insights into the status and distribution of three species of *Sternula* terns along the eastern coast of Africa and western Indian Ocean, resulting from the discoveries of two species new for Mozambique. Bull Br Ornithol Club 142 in press.
- Almalki, M 2021. Breeding biology of Saunders's tern (*Sterna saundersi*) in the Farasan Islands, Kingdom of Saudi Arabia. Saudi J Biol Sci 28: 1931-1937.
- Anderson, R C & Shimal, M 2020. A checklist of birds of the Maldives. Indian Birds Monograph 3. Hyderabad.
- BirdLife International 2021. Species factsheet: Saunders's Tern *Sternula saundersi*. Website: <https://tinyurl.com/2p8scch>. [Accessed 4 March 2021.]
- Boland, C & Alsuhaibany, A 2020. The birds of Saudi Arabia 2: Species accounts. Dubai.
- Carter, M & McAllan, I A W 2007. Saunders's Terns *Sterna saundersi* at the Cocos (Keeling) Islands. BARC submission 539.
- Chandran, A 2020. A putative Saunders's Tern *Sternula saundersi* from Kerala with notes on its identification. Malabar Trogon 18: 67-74.
- Cramp, S (editor) 1985. The birds of the Western Palearctic 4. Oxford.
- Cramp, S & Simmons, K E L (editors) 1977. The birds of the Western Palearctic 1. Oxford.
- Demongin, L 2016. Identification guide to birds in the hand. Beauregard-Vendon.
- van Duivendijk, N 2010. Advanced bird ID guide – the Western Palearctic. London.
- Eriksen, J & Victor, R 2013. Oman bird list edition 7. The official list of the birds of the Sultanate of Oman. Muscat.
- Galván, I, Negro, J J, Bortolotti, G R & Margalida, A 2009. On silver wings: a fragile structural mechanism increases plumage conspicuousness. J Avian Biol 40: 475-480.
- Gill, F, Donsker, D & Rasmussen, P (editors) 2022. IOC world bird list (version 12.1). Website: [www.world-birdnames.org](http://www.world-birdnames.org).
- Habib, M 2014. Saunders's Terns breeding at Ras Sudr, Egypt, in 2012-13. Dutch Birding 36: 20-24.
- Habib, M 2016. Surveys of breeding Saunders's Terns at Ras Sudr, Egypt, in 2014-15. Dutch Birding 38: 75-79.
- Harrison, P, Perrow, M & Larsson, H 2021. Seabirds: the new identification guide. Barcelona.
- Hirschfeld, E 1995. Birds in Bahrain: a study of their migration patterns 1990-1992. Dubai.
- Jackett, N, Graff, J, Twiss, B, Weil, K, Manins, J, Manins, P, McKay, J, McKay, G & Christie, G 2019. Saunders's Tern – South Island, Cocos (Keeling) Islands. BARC submission 1064.
- Jennings, M C 2010. Atlas of the breeding birds of Arabia. Fauna of Arabia 25. Riyadh.
- Khaleghizadeh, A, Roselaar, K, Scott, D A, Tohidifar, M, Mlíkovský, J, Blair, M & Kvartalnov, P 2017. Birds of Iran: annotated checklist of the species and subspecies. Tehran.
- Menkhorst, P, Rogers, D, Clarke, R, Davies, J, Marsack, P & Franklin, K 2017. The Australian bird guide. Princeton.
- Nadler, T 1976. Die Zwergseeschwalbe. Lutherstadt.
- Olsen, K M & Larsson, H 1995. Terns of Europe and North America. London.
- Panagoda, B G, Seneviratne, S S, Kotagama, S & Welikala, D 2020. Sympatric breeding of two endangered *Sternula* terns, Saunders's *S. saundersi* and Little *S. albifrons* Terns, in the Rama's Bridge of Sri Lanka. BirdingAsia 34: 76-83.
- Pedersen, T & Aspinall, S (compilers) 2010. EBRC annotated checklist of the birds of the United Arab Emirates. Sandgrouse Supplement 3: 1-96.
- Perlman, Y 2015. Saunders's and Little Terns ID pitfalls. Website: <https://tinyurl.com/32jfh7x>. [Accessed 29 December 2020.]
- Porter, R & Aspinall, S 2010. Birds of the Middle East. Second edition. London.
- Porter, R F & Suleiman, A S 2014. The populations and distribution of the breeding birds of the Socotra archipelago, Yemen: 2. Shearwaters to terns. Sandgrouse 36: 2-33.
- Rasmussen, P C & Anderton, J C 2012. Birds of South Asia: the Ripley guide 1 & 2. Second edition. Barcelona.
- Redman, N, Stevenson, T & Fanshawe, J 2011. Birds of the Horn of Africa. London.
- Rodríguez-Lázaro, G 2021. Separation of 1 cy Little and Least Terns and the first Least Tern for Spain. Website: <https://tinyurl.com/a8unsvn8>. [Accessed 16 November 2021.]
- Seychelles Bird Records Committee 2021. Website: <https://tinyurl.com/5x682xnj>. [Accessed 4 March 2021.]
- Sinclair, I & Langrand, O 2013. Birds of the Indian Ocean islands. Third edition. Cape Town.
- Stevenson, T & Fanshawe, J 2002. Field guide to the birds of East Africa. London.
- Sullivan, B L, Wood, C L, Iliff, M, Bonney, R E, Fink, D & Kelling, S 2009. eBird: a citizen-based bird observation network in the biological sciences. Biol Conserv 142: 2282-2292.
- Svensson, L, Mullarney, K & Zetterström, D in press. Collins bird guide. Third edition. London.

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