The taxonomic status of Annobón Scops Owl *Otus feae* and Arabian Scops Owl *O. pamelae*

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Le statut taxonomique du Petit-duc d'Annobon *Otus feae* et du Petit-duc d'Arabie *O. pamelae*. La séparation, en 2014, du Petit-duc d'Annobon *Otus feae* du Petit-duc africain *O. senegalensis* était suggérée par la combinaison de son statut insulaire, l'éloignement important des populations nidificatrices et potentiellement parentales les plus proches et sa position géographique au sud du Petit-duc de São Tomé *O. hartlaubi*. Toutefois, seulement deux spécimens avaient été examinés. Afin de reconsidérer cet arrangement, nous avons examiné sept peaux supplémentaires de *feae* et analysé ses chants. Nous avons constaté que, comparé à *O. senegalensis*, *feae* a des stries ventrales plus larges, des barres sous-alaires pâles plus faibles, des tarses plus courts, une queue plus longue, et un chant avec des notes légèrement plus aiguës et plus longues présentant davantage d'oscillations. La combinaison de ces différences vocales et morphologiques est en faveur de la rétention du rang d'espèce. Le Petit-duc d'Arabie *O. pamelae*, également séparé récemment de *O. senegalensis*, a toutefois un chant très semblable à celui de *feae*, bien que sa morphologie soit bien différente. Certains *senegalensis* produisant occasionnellement des chants avec des caractéristiques d'aussi bien *feae* que de *pamelae*, nous pourrions conclure que les trois sont conspécifiques ; soit, puisque leurs chants sont si semblables, que *feae* et *pamelae* sont conspécifiques ; soit qu'il vaut mieux traiter les trois comme espèces, en accordant des scores suffisamment élevés sur la base des données actuellement disponibles afin de respecter les critères de Tobias pour l'attribution du rang d'espèce. En attendant des recherches supplémentaires, nous préférons, pour l'instant, la dernière option.

Summary. The 2014 split of Annobón Scops Owl *Otus feae* from African Scops Owl *O. senegalensis* was encouraged by the combination of its insular status, great distance from nearest potential breeding parental populations and geographically leapfrog position in relation to São Tomé Scops Owl *O. hartlaubi*, but involved the examination of only two museum skins. To reconsider this arrangement, we examined seven additional skins of *feae* and analysed its songs. We found that, compared to *O. senegalensis*, *feae* has broader ventral streaks, weaker pale underwing barring, shorter tarsi, a longer tail, and slightly higher-pitched and longer song notes with more oscillations. The combination of these vocal and morphological differences supports the retention of species rank. However, Arabian Scops Owl *O. pamelae*, also recently separated from *O. senegalensis*, sings very much like *feae*, although it is notably divergent in morphology. Since individual *senegalensis* occasionally produce songs with characteristics of both *feae* and *pamelae*, we could take the view that all three are conspecific; or, since their songs are so similar, that *feae* and *pamelae* are conspecific; or, by scoring sufficiently highly on current evidence to meet the Tobias criteria for species rank, that all three are best treated as species. Pending further research, we provisionally favour the last option.

Given the cryptic plumages and relatively uniform small sizes of *Otus* scops owls, which render them difficult to parse confidently into species using morphology alone, it has taken the development of acoustic and, to a lesser degree, genetic analysis to begin to reveal the true extent of their taxonomic diversity. The number of Old World *Otus* owls has thus risen from 20 in Peters (1940) through 31 in Sibley & Monroe (1990) and 38 in Dickinson (2003) to 53 in del Hoyo & Collar (2014). This trajectory largely reflects the steady accumulation and improved ease of analysis of acoustic evidence from remote areas.

Not all of these elevations to species rank are clear-cut, however. A case of particular interest involves the split of Annobón Scops Owl *O. feae* (del Hoyo & Collar 2014), which one of us (NJC), using the criteria for gauging species rank proposed by Tobias *et al*. (2010), made mainly on geographical and biogeographical considerations (see below), and which he immediately came to regret as poorly researched and probably mistaken. Nevertheless, in investigating this case acoustically we found that this owl's taxonomic rank could not be satisfactorily investigated without reconsideration of another recent split, Arabian Scops Owl *O. pamelae* (König *et al*. 2008, Pons *et al*. 2013).

To assess the degree of difference between these taxa in voice, plumage and dimensions

we continued to make use of the system of scoring in Tobias *et al*. (2010), in which an exceptional character (radically different coloration, pattern, size or sound) scores 4, a major character (pronounced difference in body part colour or pattern, measurement or sound) 3, medium character (clear difference, e.g. a distinct hue rather than different colour) 2, and minor character (weak difference, e.g. a change in shade) 1; a threshold of 7 is set to allow species status, which cannot be triggered by minor characters alone, and only three plumage characters, two vocal characters, two biometric characters (assessed for effect size using Cohen's *d* where 0.2–2 is minor, 2–5 medium and 5–10 major) and one behavioural or ecological character (allowed 1) may be counted (hence 'ns' with a number in square brackets is used where a difference is identified and judged for its strength, but 'no score' is permissible). Measurements of specimens were taken with digital callipers accurate to two decimal points for bill (skull to tip), wing (curved), tarsus (tarsometatarsus from back of 'ankle' to the distal side of the basal joint ['knuckle'] of the longest toe) and tail (from point of insertion to tip).

Annobón Scops Owl *Otus feae*

Described from six specimens as the species *Scops feae* (Salvadori 1903), this resident of the tiny outermost island in the Gulf of Guinea, Annobón (to Equatorial Guinea), was treated throughout the 20th and early 21st centuries as a subspecies of either Eurasian Scops Owl *O. scops* (e.g. Fry *et al*. 1988, Jones & Tye 2006) or, more frequently, African Scops Owl *O. senegalensis* (e.g. Bannerman 1933, Peters 1940, de Naurois 1994, König *et al*. 1999, 2008, Marks *et al*. 1999, Borrow & Demey 2001, Mikkola 2012, 2013). The overlap between these specific attributions is due to the fact that Eurasian and African Scops Owls were themselves considered conspecific over that time, although evidence furnished simultaneously 40 years ago by Chappuis (1978) and Marshall (1978) clearly established the vocal basis of the split of the two forms, as accepted by, e.g., Dowsett & Dowsett-Lemaire (1980).

NJC's review of the status of the scops owl on Annobón, made while researching species limits for a recent world checklist of birds (del Hoyo & Collar 2014), was prompted by three considerations:

(1) the absence of *O. senegalensis* not only from all of the other islands in the Gulf of Guinea but also from the adjacent wet tropical Guinea-Congo forest zone, creating a geographical and ecological gap (acknowledging that range disjunction *per se* is not a taxonomic character: del Hoyo & Collar 2014: 33) of more than 1,000 km (Fig. 1);

(2) the growing evidence of speciation by *Otus* owls on oceanic islands, where most of the newly identified species are to be found (e.g. Nicobar Scops Owl *O. alius*, Rinjani Scops Owl *O. jolandae*, Siao Scops Owl *O. siaoensis*, Wetar Scops Owl *O. tempestatis*); and

(3) the circumstance that the nearest Gulf of Guinea island, São Tomé, hosts the endemic (and threatened: IUCN category Vulnerable) species, São Tomé Scops Owl *O. hartlaubi* (Collar & Stuart 1985, BirdLife International 2018), while another island (even closer to Africa), Príncipe, harbours an unidentified presumed *Otus* which 'could refer to *O. hartlaubi*, *O. scops*, or another [species]' (Jones & Tye 2006; also Melo & Dallimer 2009, Verbelen *et al*. 2016). The fact that at least one species of *Otus* is interposed between the bird on Annobón and the African mainland suggested the need for closer scrutiny of *feae*.

Specimens of *feae* are few; apart from the six collected by Leonardo Fea in Genoa, which NJC did not visit during his checklist assessments, he was only able to examine two, a female in NHMUK (1911.12.23.4044) and an unsexed 'adult' in ZMB (2000/28700). From this he decided, using the Tobias criteria for scoring degrees of difference (Tobias *et al*. 2010), to split the taxon from both *O. scops* and *O senegalensis*, reporting in del Hoyo & Collar (2014) that it

> 'differs from former in its evidently distinct voice and several plumage characters (not enumerated here), and from latter in its possibly different voice (reportedly a 'lightly trilled call' like high-pitched *Tyto alba*: Jones & Tye 2006) (ns); much broader black streaking, streaks on crown fusing to form mainly blackish mid-crown (3); absence of pale grey areas throughout feathering (2); virtual absence of patterning on inner webs of flight-feathers, except for

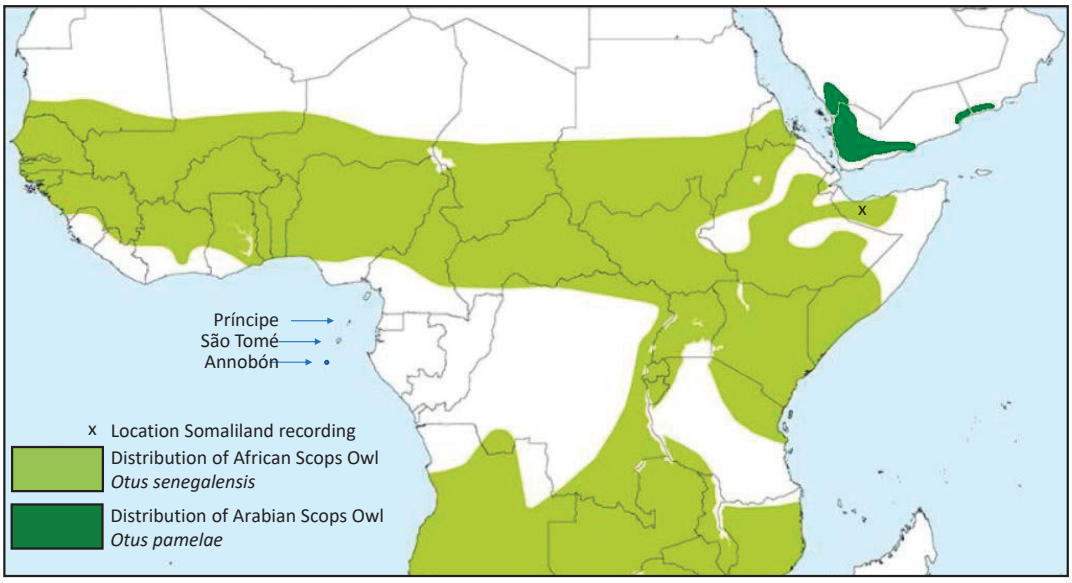

Figure 1. Map of the northern two-thirds of the distribution of African Scops Owl *Otus senegalensis* and that of Arabian Scops Owl *O. pamelae*, with the islands of the Gulf of Guinea indicated. Range outlines are derived from del Hoyo *et al.* (2019).

Carte des deux-tiers de la distribution septentrionale du Petit-duc africain *Otus senegalensis* et de celle du Petit-duc d'Arabie *O. pamelae* (d'après del Hoyo *et al.* 2019). Les îles du Golfe de Guinée sont indiquées par une flèche.

large whitish wedges (absent or much reduced in *senegalensis*) along edges of secondaries (2); slightly larger bill (on only specimen in NHMUK) (ns). However, these characters require confirmation from larger sample of (living) specimens (museum material very limited), while preliminary molecular evidence indicates close link with *O. senegalensis* (M. Melo *in litt.*). Monotypic.'

This diagnosis and caveat were repeated by Demey & Sloan (2017), who commented that, based on Sloan's photographs, the plumage differences between *feae* and *O. senegalensis* are not so exaggerated as suggested in del Hoyo & Collar (2014) but are, in fact, 'rather slight'.

Further scrutiny of these photographs and all specimen material of *senegalensis* in NHMUK caused NJC to agree. We therefore set out to consider the case more fully. NJC examined and measured a third specimen of *O. feae* in the Senckenberg Museum, Frankfurt (SMF 25452), and the six specimens comprising the type series in the Museo Civico di Storia Naturale, Genoa, Italy (MSNG 15876–15881), plus the 24 specimens of *O. senegalensis* collected between (and including) Ghana and Uganda in NHMUK, and the same museum's nine adult specimens of *O. pamelae*. PB reviewed and analysed the acoustic evidence available online, including the recorded material discussed in Demey & Sloan (2017).

The three specimens of *feae* in NHMUK, ZMB and SMF are rather poorly prepared, with dishevelled plumage and badly set wings (Fig. 2). They also have in common rather heavy broad black markings above and below, strong patches of rufous, and bold white spots visible in the remiges. The six specimens in MSNG are, by contrast, neatly prepared and exhibit a less contrasting coloration, with rather narrower black streaking, less obvious touches and tufts of rufous and many fewer obvious white spots (Fig. 3). These differences may in large part be attributable to the standard of skin preparation, but it still appears as if Fea's series (taken 8 April–21 May 1902) might not be wholly representative of the variability within the Annobón population.

Nevertheless, compared to the equatorial sample of 24 *O. senegalensis* in NHMUK, these nine specimens all differ in their rather broader black streaking on the belly (Tobias score 1; Figs. 2–5);

Figure 2. Ventral view of three specimens of Annobón Scops Owl *Otus feae* in (a) NHMUK (1911.12.23.4044), (b) ZMB (2000/28700) and (c) SMF (25452) (N. J. Collar, (a) © Natural History Museum)

Vue ventrale de trois spécimens du Petit-duc d'Annobon *Otus feae* conservés au (a) NHMUK (1911.12.23.4044), (b) ZMB (2000/28700) et (c) SMF (25452) (N. J. Collar, (a) © Natural History Museum)

Figure 3. Ventral view of six specimens of Annobón Scops Owl *Otus feae* (MSNG 15876–15881) (Enrico Borgo)

Vue ventrale de six spécimens du Petit-duc d'Annobon *Otus feae* (MSNG 15876–15881) (Enrico Borgo)

less prominent white barring on the underwing (score 1); slightly shorter wing (Table 1; effect size −1.17, score 1) and rather longer tail (Table 1; effect size 2.4, score 2). The two distinguishing plumage characters prove to be the same two used by Salvadori (1903) in his original description. The morphometric differences have hitherto been unreported. Contrary to del Hoyo & Collar

Figure 4. Ventral view of six randomly chosen specimens of African Scops Owl *Otus senegalensis* in NHMUK (N. J. Collar © Natural History Museum)

Vue ventrale de six spécimens choisis au hasard du Petit-duc africain *Otus senegalensis* au NHMUK (N. J. Collar © Natural History Museum)

Figure 5. Black ventral streak width comparison: Annobón Scops Owl *Otus feae* left (NHMUK 1911.12.23.4044), African Scops Owl *O. senegalensis* right (NHMUK 1936.2.21.480) (N. J. Collar © Natural History Museum)

Comparaison de la largeur des stries ventrales : Petit-duc d'Annobon *Otus feae* à gauche (NHMUK 1911.12.23.4044), Petit-duc africain *O. senegalensis* à droite (NHMUK 1936.2.21.480) (N. J. Collar © Natural History Museum)

(2014), however, the new data show that *feae* does not after all differ from *senegalensis* in bill size or in consistently having prominent whitish wedges on the inner vanes of the secondaries.

These new scores reduce the distinctiveness of *feae* below the Tobias threshold of 7 for recognition as an independent species. However, Demey & Sloan (2017) went on to judge that the song of *feae* 'is similar, although not entirely identical', to that of *O. senegalensis*. Analysis of recordings reveals that the trilled song of *feae* is indeed similar to that of *senegalensis*, which has been described as 'a single, short, vibrant *prr-u-u-p*' (Borrow & Demey 2001), but discernibly longer in duration and involving a greater number of oscillations (Fig. 6, Table 2), although a single recording of *senegalensis* (XC164447) documents a song note even longer (0.55 seconds) than any yet found in *feae*, albeit still having fewer oscillations. A slightly higher pitch in *feae* is only a minor difference (score 1), while the duration and number of oscillations are assumed to be correlated; given that *senegalensis* can at least occasionally match or surpass the duration of the call, this characteristic is here considered only a medium difference (score 2). Intervals between the trilled notes seem to be another distinguishing feature: those in *senegalensis* are typically shorter, particularly in southern populations (ns[1]). Furthermore, while the shape of the trill (on the sonogram) is quite variable in *senegalensis*, unlike

Table 1. Means, standard deviations and ranges in the morphometrics of Annobón Scops Owl *Otus feae*, African Scops Owl *O. senegalensis* and Arabian Scops Owl *O. pamelae*. [a] *n* = sample size 7; [b] = sample size 23; [c] = sample size 21; [d] = sample size 8.

Tableau 1. Moyennes, écarts-type et fourchettes des mensurations du Petit-duc d'Annobon *Otus feae*, Petit-duc africain *O. senegalensis* et Petit-duc d'Arabie *O. pamelae*. Taille de l'échantillon *n* : [a] = 7 individus ; [b] = 23 individus ; [c] = 21 individus ; [d] = 8 individus.

taxon	*n*	bill	wing	tarsus	tail
Otus feae	9	17.4 ± 0.96 15.0–19.2	124.4 ± 2.96 122–129	26.4 ± 1.41[a] 24–28	61 ± 1.73 58–64
Otus senegalensis	24	17.6 ± 0.91[b] 15.2–19.6	128.9 ± 4.53 119–135	27.6 ± 0.97[c] 26–30	56.3 ± 2.16 53–60
Otus pamelae	9	18.45 ± 0.91[d] 17.0–19.4	134.9 ± 5.21 129–144	31.4 ± 1.01 30–33	62.4 ± 2.51 58–66

Table 2. Characteristics of the songs of three *Otus* scops owls, based on publicly available recordings on the xeno-canto (XC) website: XC44210, 346932, 368181, 382950, 398169, 400190, 405129, 424656 (African Scops Owl *O. senegalensis*); XC340505, 340506, 340717 (Annobón Scops Owl *O. feae*); XC255290, 307557, 371431, 395181, 407592, 415226 (Arabian Scops Owl *O. pamelae*). Ranges of characteristics given; extreme values between parentheses are believed to be anomalous or deviating from homologous conditions.

Tableau 2. Caractéristiques des chants de trois petit-ducs *Otus*, basées sur des enregistrements accessibles au public sur le site internet xeno-canto (XC) : XC44210, 346932, 368181, 382950, 398169, 400190, 405129, 424656 (Petit-duc africain *O. senegalensis*) ; XC340505, 340506, 340717 (Petit-duc d'Annobon *O. feae*) ; XC255290, 307557, 371431, 395181, 407592, 415226 (Petit-duc d'Arabie *O. pamelae*). Les fourchettes des caractéristiques sont données ; les valeurs extrêmes entre parenthèses sont soupçonnées d'être anormales ou de dévier des conditions homologues.

Characteristic	*senegalensis*	*feae*	*pamelae*
Max. frequencies (Hz)	1,240–1,570	1,500–1,520	1,360–1,740
Average frequencies (Hz)	950–1,200	1,160	1,100–1,300
Minimum frequencies (Hz)	800–1,000	1,000–1,060	840–1,000
Duration of song-note (seconds)	0.21–0.40(–0.55)	0.39–0.48	(0.31–)0.40–0.43
Number of oscillations	4–10(–11)	12–14	(9–)11–13
Intervals (seconds)	4.2–7.0 (–10.2)	6.9–9.6	6.7–9.9 (–12.0)

in *feae* it typically shows a slow starting oscillation (ns; Fig. 6).

Two further but minor points are worth mentioning. First, the irides of *feae* in the photographs in Demey & Sloan (2017) appear a pale yellowish-green colour, while those of *senegalensis* in online photographs are uniformly yellower, lacking a greenish hue; but whether this reflects a taxon-specific rather than individual difference, or is merely an effect of the light, of the lenses used or of photographic processing remains unknown. Second, *feae* seems to prefer wet forest, which is exactly the habitat that *O. senegalensis* avoids on the mainland, being instead confined to savannah and woodland. However, given that wetter habitats tend to be related to darker plumage (Gloger's Rule), a habitat difference cannot be scored as it is already reflected in the score for broader dark streaking. In any case, research reported in Demey & Sloan (2017) has found that the owl occurs in drier stands of 'moist' forest on Annobón, which undermines the notion of a clear ecological difference from *senegalensis*.

The morphological (5) and vocal (3) scores take the total level of differentiation to 8, and on this basis, until further evidence is available, we surmise that, contrary to our expectations, *feae* merits continued recognition as a full species, albeit of relatively recent origin. However, this position is at least in part dependent on an examination of its relationship with a taxon on the other side of the African continent.

Arabian Scops Owl *Otus pamelae*

An owl discovered in south-western Saudi Arabia in 1936 was assigned to African Scops Owl *O. senegalensis* but distinguished at the subspecific level as *O. s. pamelae* on account of its longer wing, 'more dingy or earthy general appearance' and less heavy blackish shaft-streaks (Bates 1937). This treatment went unchallenged until the second

Figure 6. Sonograms of song-note of four scops owls belonging to three taxa: **a** and **b**, African Scops Owl *Otus senegalensis* (XC44210, Uganda, G. Wagner; XC398169, Zambia, P. Boesman); **c**, Annobón Scops Owl *O. feae* (XC340505, Annobón, B. Sloan); **d**, Arabian Scops Owl *O. pamelae* (XC371199, Oman, M. Feuersenger).

Sonogrammes d'une note du chant de quatre petit-ducs appartenant aux trois taxons : **a** et **b**, Petit-duc africain *Otus senegalensis* (XC44210, Ouganda, G. Wagner ; XC398169, Zambie, P. Boesman) ; **c**, Petit-duc d'Annobon *O. feae* (XC340505, Annobón, B. Sloan) ; **d**, Petit-duc d'Arabie *O. pamelae* (XC371199, Oman, M. Feuersenger).

edition of König *et al*. (2008), where, under the name Arabian Scops Owl, *pamelae* was given species rank on account of its voice being 'higher in pitch, more scratchy and longer: *krreerrch*' and because African 'is much darker with more prominent streaks on breast and a more distinct, whitish scapular-stripe'. Two years later a field guide (Porter & Aspinall 2010) also used the name Arabian Scops Owl, but retained the name *senegalensis* in brackets to reflect uncertainty over the status of the two forms.

Mikkola (2012, 2013) followed the split and furnished some photographs, but it was integrative work by Pons *et al*. (2013) that more firmly established the basis for separating the two taxa, partly through their quantitative morphometric evidence for longer tarsus and wing, and partly by the finding that *pamelae* is sister to the clade that comprises *Otus scops*, *O. hartlaubi*, Pemba Scops Owl *O. pembaensis* and *O. senegalensis*. These factors, the plumage differences and the vocal evidence—the song being described as 'higher-pitched', with 'more prolonged notes', and sounding both 'scratchier' and 'two-parted, due to the much quieter first note' (albeit this last point is not apparent in our own analysis), rendered the split of *pamelae* highly plausible.

Confirmation of the rather unexpected molecular findings in Pons *et al*. (2013) is desirable, but *Otus pamelae* has since generally been accepted as a full species (e.g. del Hoyo & Collar 2014, Robb 2015, Gill & Donsker 2018). Under the Tobias criteria, *pamelae* shows an effect size of 2.65 for longer tarsus on the basis of the data (comparing the sample with birds with the next longest tarsi, from Sudan) in Pons *et al*. (2013) (score 2), is overall less contrasting in plumage, with the rufous patches of *senegalensis* ochraceous and therefore less apparent (1), a much greater predominance of underlying grey vermiculations on the underparts (2) and considerably less white in the plumage, including a less obvious elongate white patch on the scapulars (2). The higher pitch and greater length of the call and the longer intervals between calls (Fig. 6, Table 2) score 1, 2 and ns[1] respectively, as in Annobón Scops Owl, and a total of 10 is reached based on these new data but in broad accord with the previous assessment in del Hoyo & Collar (2014).

Nevertheless, the identity of Somaliland representatives of *senegalensis* is perplexing. Pons *et al*. (2013) found that specimens sampled genetically show little differentiation from Kenyan *senegalensis*, but that a recording from the highlands resembles that of *pamelae*. They set the issue aside by expressing the view that 'vocal differences among *Otus* taxa do not always reflect evolutionary affinities among lineages'. Simultaneously Robb (2015) introduced a further level of uncertainty in finding that the vocal distinction between *O. pamelae* and *O. senegalensis* is not always clear: 'of the 17 [recordings of *senegalensis*] on xeno-canto, two from Zambia are as high-pitched as Arabian Scops and one from Ghana has hoots that are just as long'. Such occasional variation prompts the consideration that the single Somaliland recording could also represent a sample with extreme values within the range of vocal parameters of *senegalensis*. Indeed, our analysis of this publicly unavailable recording (by N. Borrow) indicates that all basic sound parameters are intermediate between typical *senegalensis* and *pamelae*, but none of the measurements falls outside the full data ranges of *senegalensis*.

Perhaps most intriguing is the fact that the songs of *feae* and *pamelae*, both of which differ from *senegalensis* in being slightly higher pitched, more protracted with more oscillations, and uttered at a slower pace, sound virtually identical. Robb (2015) remarked that *typically* the call of *pamelae* starts at the lower end of frequency, something which cannot yet be determined

for *feae* from the few available recordings, but the similarity is nonetheless remarkable. Could this simply be convergence, or could it possibly indicate an ancestral link between the two, recalling the strange circumstance in which the African continent separates São Tomé Spinetail *Zoonavena thomensis* from Madagascar Spinetail *Z. grandidieri* (Chantler 1999) or in which the Eurasian Buzzard on the Cape Verde Islands *Buteo buteo bannermani* is apparently more closely related to Socotra Buzzard *B. socotraensis* than to *B. buteo* in Europe (Kruckenhauser *et al.* 2004)? Could Arabian and Annobón Scops Owls conceivably even be conspecific?

One, two or three species?

The case for returning *O. feae* and *O. pamelae* to subspecies of *O. senegalensis* is arguable, on the purist view that vocal diagnostic characters must be 100% consistent and taking the line that the molecular evidence placing *pamelae* in a separate clade requires confirmation (or that the paraphyletic arrangement that it presents need not be regarded as decisive, since character divergence can take place at different speeds in different circumstances). However, adoption of such a position would appear to be overly conservative and, taking a cue from Gill (2014), we consider that the onus more appropriately falls on those preferring to maintain a single species to furnish the conclusive evidence.

The case for treating *feae* and *pamelae* as one species distinct from *senegalensis* is also arguable. Vocal similarity of the kind these first two taxa show (see Fig. 6 and Table 2) is ostensibly rather compelling, and has been used to recommend the lumping of owl species, e.g. Colombian Screech Owl *Megascops colombianus* with Rufescent Screech Owl *M. ingens* (Krabbe 2017). However, the morphological differences between *feae* and *pamelae* are compelling in the opposite direction. The nine specimens of *feae* that we have examined possess a clearly much shorter bill, wing and, notably, tarsus than the nine *pamelae* (Table 1; effect size for tarsi −4.13, score 2). They are markedly richer and more contrasting in coloration, largely lacking the underlying grey vermiculations of *pamelae* (2) and with considerably more white throughout the plumage, including the scapulars (2), yet with less prominent white barring on the underwing (1). A Tobias score of 7, despite the lack of obvious distinction in basic sound parameters, maintains these forms as separate species.

The taxonomic note in del Hoyo & Collar (2014) mentioned M. Melo's 'preliminary molecular evidence' of *feae*'s 'close link with *O. senegalensis*', and this circumstance stands (Melo *et al.* in prep.). Nevertheless, on current evidence a Tobias score of 8 serves to maintain these forms as separate species as well. We therefore conclude that the *status quo* of three species is the most tenable provisional option for this complex of scops owls. Further molecular work, the examination of other museum material of *feae*, if any such exists, and more extensive sound recording on Annobón and elsewhere may eventually provide the basis for a different arrangement.

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