A revised bird checklist for the oceanic islands of the Gulf of Guinea (Príncipe, São Tomé and Annobón)

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A revised bird checklist for the oceanic islands of the Gulf of Guinea (Príncipe, São Tomé and Annobón)

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Summary.—We present an updated bird checklist for the oceanic islands of the Gulf of Guinea. Their avifauna comprises 146 confirmed species, an increase of 19% in 15 years. Of these, 66 are resident landbird species (32 on Príncipe, 50 on São Tomé and 11 on Annobón), including 29 endemic species, 17 endemic subspecies and 17 possibly non-native species. The remaining avifauna consists of six breeding seabird species, four non-breeding migrants, 62 vagrants and eight species of uncertain status. An additional 51 species have been reported but lack confirmation. Most recent changes reflect increases in observer activity and involve vagrant and unconfirmed species, but a few result from previously overlooked historical records and taxonomic changes. Of the three islands, most changes affected the avifauna of Príncipe, whereas little new information has come from Annobón. Future changes are predicted to arise from new reports and confirmation of vagrants, but also from further taxonomic revision of residents.

The oceanic islands of the Gulf of Guinea have long been known as a global priority for biodiversity conservation due to the outstandingly large number of endemic species (e.g., WWF & IUCN 1994–97, Le Saout et al. 2013, BirdLife International 2020a). In particular, their avifauna is unique and threatened (e.g., Collar & Stuart 1988, Stattersfield et al. 1998, Buchanan et al. 2011, Le Saout et al. 2013, BirdLife International 2020b, IUCN 2020).

Although one of the first descriptions of the islands provided a rather extensive list of bird species (Valentim Fernandes 1506–10 in Henriques 1917), ornithological research only started on the islands in the 18th century, when the first endemics, São Tomé Green Pigeon Treron sanctithomae and Príncipe Starling Lamprotornis ornatus, were described. Most of the endemic birds were described during the 19th and 20th centuries (Table 2). In recent decades, use of molecular techniques has revolutionised the systematics of the islands’ birds. In addition to clarifying the taxonomic status of many bird populations (e.g., Melo 2007), these techniques have also afforded a better understanding of their evolutionary history and biogeography (e.g., Melo 2007, Valente et al. 2020).

Despite the acknowledged biological importance of these islands, much remains unknown, even among birds, the best-studied taxonomic group (Jones 1994). New endemic birds are still being identified, such as the putative Príncipe Scops Owl, whose presence was confirmed as recently as 2016 (Ryan 2016, Verbelen et al. 2016), and whose evolutionary distinctiveness is supported by multiple lines of evidence (Freitas 2019). Further studies might also prove other populations are best treated as endemic species, including the local population of Band-rumped Storm Petrel Oceanodroma cf. castro (Flood et al. 2019) and the distinctive São Tomé endemic subspecies of Barn Owl Tyto alba thomensis (Uva et al. 2018, Alves 2019), Lemon Dove Columba larvata simplex (Pereira 2013) and Chestnut-winged Starling Onychognathus fulgidus fulgidus (Christy & Clarke 1998). In addition, since much of the importance of these islands is based on the endemic-rich resident avifauna, less...
attention has hitherto been paid to other groups of species, namely aquatic and migrant species (de Lima & Martins 2020).

The most up-to-date bird checklist for the oceanic islands of the Gulf of Guinea mentions the occurrence of 118 species on the three islands of São Tomé, Príncipe and Annobón, their offshore islets and surrounding seas (Jones & Tye 2006). These include 28 endemic species among 62 resident landbirds, six breeding seabirds, seven non-breeding migrants, 34 vagrants, and nine species of uncertain status. Additionally, there were 45 unconfirmed species and 21 endemic subspecies. The present contribution revises the

Figure 1. Map of (a) part of the Gulf of Guinea showing the oceanic islands and (b) Príncipe, (c) São Tomé and (d) Annobón. The inset in the top right of (a) shows the islands’ location in relation to the African continent.
regional checklist, based on a critical review of older literature and many recent records, most of them the result of casual observations.

**Study area**

The oceanic islands of the Gulf of Guinea, off the Atlantic coast of Africa, form the southern portion of the Cameroon line of volcanoes, which stretches 1,600 km from Annobón to the Mandara Mountains on the African mainland (Fitton & Dunlop 1985). They include three main islands: Príncipe and São Tomé (the Democratic Republic of São Tomé and Príncipe), and Annobón, which is administered by the Republic of Equatorial Guinea. They also include numerous associated islets, such as Boné de Jóquei, Tinhosas, Sete Pedras, Rolas and Tortuga (Fig. 1). Bioko is not included because it is a continental island, and its avifauna is very different to that of the oceanic islands, being much closer to that of mainland Africa (Jones 1994).

The climate of the three islands is similar (Jones & Tye 2006). Their high relief intercepts prevailing moist south-westerly winds, creating a rain-shadow. Annual rainfall is thus greatest in the south-west of each island, exceeding 7,000 mm on São Tomé and 5,000 mm on Príncipe, but probably much less on Annobón (there are no data for the relevant part of the island), and lowest in the north-east, receiving just 600, 2,000 and 1,000 mm, respectively. All three islands have long rainy seasons, and humidity is very high for most of the year. The main dry season runs from mid May to late August, with a short and unreliable dry season that may last for a few weeks during December–February (Chou et al. 2020). The precise timings and durations of the seasons vary between islands, and strongly within them, but the dry seasons tend to be most marked in the north of each island, whereas south-western and central parts are wet year-round (Jones & Tye 2006). Daily max. temperatures at sea level vary between 22 and 33°C. Mean max. temperatures may be similar at higher elevations, but absolute minima are much lower, falling below 10°C at 700 m. Winds are generally light and more prevalent during the dry season, but strong winds can accompany storms that tend to occur during the change of seasons. Light levels can be very low, especially in the centre and south of each island, where cloud cover during the day can be near-permanent.

Príncipe (01°32–01°43’N, 07°20–07°28’E; 139 km²) is 220 km west of the coast of Central Africa and 146 km north-east of São Tomé (Jones & Tye 2006). It comprises a relatively flat, low-lying basalt platform in the north, with a rugged mountainous southern region, where the main peaks are located, including Pico do Príncipe (948 m), Mencorne (935 m) and Carriote (830 m). Once completely covered by rainforest, most accessible areas have been cleared and planted, although some have reverted to secondary forest. Remaining native forest is mostly restricted to rugged terrain, including some lowland forest in the south and montane forest around Pico do Príncipe.

São Tomé (00°25–00°01’S, 06°28–06°45’E; 857 km²) is 255 km west of Gabon (Jones & Tye 2006). The equator passes through Ilhéu das Rolas, just south of the main island, which is cone-shaped, typical of islands marked by recent volcanism. Its highest point is Pico de São Tomé at 2,024 m, although a multitude of high peaks and volcanic plugs is scattered across São Tomé, of which Cão Grande (663 m) is the most impressive. The north-east of the island slopes gently to the sea, while the remainder is cut by deep river valleys that disgorge into mostly rocky beaches on the west coast, and into mainly sandy or marshy areas elsewhere over the island. Apart from very small areas of mangrove and sand dune along coasts, and some dry woodland in the north, rainforest was the native vegetation in São Tomé. Currently, native vegetation is, as on Príncipe, mostly restricted to the rugged
centre and south-west of the island. Nevertheless, only a few areas have entirely lost their forest cover, such as the fire-prone savannas in the north, around the few human settlements mostly along the coast and in the north-east, the horticultural areas at higher elevations on the north-east slopes, coconut groves on the coast and oil palm monocultures in the south. Most agricultural areas are agroforestry systems with dense canopy cover, such as forest gardens or shade plantations of cocoa and coffee. Extensive parts of the island are covered by second growth.

Annobón (01°24’–01°28’S, 05°36’–05°38’E; 17 km²) is 340 km west of the mainland and 180 km south-west of São Tomé (Jones & Tye 2006). The island’s centre comprises the crater of Quioveo (640 m), and Santamina, the highest point at 700 m. Other geological landmarks include Pico do Fogo, a trachyte plug rising to 450 m, and Lago a Pot, a small crater lake at 220 m, which dries up during prolonged droughts. Only three valleys hold permanent streams, and the north has savanna-like formations and dry bush, with dry lowland forest to the south (Jones & Tye 2006). The south of the island is characterised by taller mist-forest covered by epiphytes. Vegetation is reported to have been less modified by humans than on São Tomé and Príncipe, and there is little sign of former cocoa and coffee plantations, now abandoned and colonised by regrowth rich in non-native plants. The north has been most affected by human activity, and the majority of level-ground areas up to the Lago a Pot crater are cultivated.

In 2015, Príncipe had 7,344 human inhabitants (52/km²), São Tomé 171,395 (200/km²; INE 2020) and Annobón 5,314 (313/km²; INEGE 2017). Most people live in the north of the islands, especially the flattest coastal areas, whilst the south and centres retain most of their forest cover (Norder et al. 2020). Despite international recognition of the global importance of the avian diversity of these islands, conservation efforts are limited (BirdLife International 2019). Each island has a protected area, i.e., Annobón Nature Reserve (17 km²), created in 2000, and Príncipe Obô Natural Park (45 km²) and São Tomé Obô Natural Park (262 km²), both established in 2006 (UNEP-WCMC & IUCN 2020). These areas include most remaining native forest (Fundação Príncipe 2019, Soares et al. 2020). The laws by which the São Tomé and Príncipe parks were created envisaged the establishment of buffer zones, which would function as transition zones to minimise the impact of human activity (Direccão Geral do Ambiente 2006a,b). Unfortunately, the boundaries and regulation of these buffer zones remain undefined, and effective management is lacking (BirdLife International 2019). Since 2012, all of Príncipe has been a UNESCO Biosphere Reserve (UNESCO 2020).

Revised checklist

We compiled all available bird records for the Gulf of Guinea oceanic islands, including offshore records (Tables 1–2). English names, taxonomy, and information concerning distribution and migration were taken from Birds of the world (Clements et al. 2019, Billerman et al. 2020). Records were identified to the lowest taxonomic category possible.

Species were considered resident if they completed their life cycle in the study area. Resident species were considered native if there was no indication that their presence in the region was due to anthropogenic interference, otherwise they were considered possibly non-native. These include species that might have been introduced deliberately or accidentally, or could have expanded their range naturally, benefitting from new environments that have appeared on the islands as a result of human activity. Native taxa were considered endemic if their distribution is restricted to the oceanic islands of the Gulf of Guinea. Migrants were classified as one of three types: (i) breeding, which included all migrant species that breed on the islands (all of which are seabirds); (ii) non-breeding, which do not breed but are...
recorded most years; and (iii) vagrant, which are not recorded most years but their presence has been confirmed. Species were considered confirmed when at least one record involved a museum specimen, ringing or tracking device, photo, video, or sound-recording. If a species’ occurrence was based solely on unsubstantiated observations (i.e., without photo or other documentation), it was considered unconfirmed. We elected to list all unconfirmed species, because details of these records might be helpful to guide future work. Taxa were considered extinct or extirpated on São Tomé and Príncipe if there was no reliable record of occurrence this century (during which the islands have been extensively surveyed: Fundação Príncipe 2019, Soares et al. 2020). On Annobón all recorded breeding species are known to persist.

**TABLE 1**

Number of species known from the oceanic islands of the Gulf of Guinea. Totals are indicated for each island and for the entire region, including offshore records. * Includes the subspecies of Príncipe Seedoeater *C*rihagra rufobrunnea* endemic to Boné de Jóquei Islet; ** includes the subspecies of Príncipe Seedoeater endemic to São Tomé; *** assumes that Annobón does not share the subspecies of Emerald Cuckoo *Chrysococcyx cupreus* with Príncipe and São Tomé; **** includes extinction of the endemic subspecies of Olive Ibis *Bostrychia olivacea rothschildi*, and extirpation of Red-headed Lovebird *Agapornis pullarius* and Red-headed Quelea *Quelea erythrornas*.

|                  | Príncipe | São Tomé | Annobón | Total |
|------------------|----------|----------|----------|-------|
| Confirmed        | 90       | 96       | 30       | 146   |
| Resident         | 32       | 50       | 11       | 66    |
| Endemic species  | 11       | 20       | 2        | 29    |
| Shared           | 3        | 3        | 1        | 3     |
| Single-island    | 8        | 17       | 1        | 26    |
| Endemic subspecies | 9*     | 8**      | 2        | 17    |
| Shared           | 2        | 2        | 0***     | 2     |
| Single-island    | 7*       | 6**      | 3        | 16    |
| Possibly non-native | 5      | 17       | 3        | 17    |
| Extirpated       | 3****    | 0        | 0        | 1     |
| Breeding seabirds | 5      | 3        | 4        | 6     |
| Regular migrant  | 3        | 4        | 1        | 4     |
| Vagrant          | 44       | 32       | 11       | 62    |
| Uncertain status | 6        | 7        | 3        | 8     |
| Unconfirmed      | 30       | 45       | 10       | 51    |
| Erroneous        | 0        | 2        | 0        | 2     |

**TABLE 2**

Annotated bird species checklist for the oceanic islands of the Gulf of Guinea. English names, taxonomy, and information concerning distribution and migration taken from *Birds of the world* (Clements et al. 2019, Billerman et al. 2020). Occurrence and status by island indicated as follows: Príncipe (P), São Tomé (S), Annobón (A) or offshore (O): endemic species (E), endemic subspecies (S), possibly non-native (I), native resident (R), breeding seabird (B), regular non-breeding migrant (M), vagrant (V), uncertain (?), unconfirmed (U), extinct (X) or misidentification (-). Capital letters indicate status in previous checklist (Jones & Tye 2006), while lower case indicate current status, where different. ‘Possibly non-native’ species are classified as such herein, based on information in the previous checklist. Superscript letters indicate the type of evidence used to classify vagrants (S: museum specimens, T: tracking devices, P: photos or
videos, R: ringing records, or A: sound-recordings). For example, ‘v$^S$’ in the ‘P’ column = a vagrant taxon confirmed by museum specimen on Príncipe since the previous checklist, while ‘v$^P$’ in ‘S’ = a taxon that was already listed as a vagrant for São Tomé based on photographic evidence, and ‘i’ in ‘A’ a taxon that has only recently been identified as possibly non-native on Annobón. Where known, subspecies are shown only for confirmed breeding species. The right-hand column references updates to the previous checklist and explains uncertain statuses, using the island column codes. In a few cases this column also provides additional details or clarifies taxonomic changes from the previous list.

| Taxa                                | P    | S   | A    | O    | Reference                                                                 |
|--------------------------------------|------|-----|------|------|---------------------------------------------------------------------------|
| **FAMILY ANATIDAE**                  |      |     |      |      |                                                                            |
| Knob-billed Duck _Sarkidiornis melanotos_ (Pennant, 1769) |      |     |      | V$^S$ |                                                                            |
| African Pygmy Goose _Nettapus auritus_ (Boddaert, 1783)   | v$^S$| v$^P$|      |      | Pv$^S$: Correia _et al_. (2021). Sv$^S$: Hansson & Thomasson (2014), ebird.org/checklist/S52109208. |
| **FAMILY NUMIDIDAE**                 |      |     |      |      |                                                                            |
| Helmeted Guineafowl _Numida meleagris_ (Linnaeus, 1758)  | U    | i   | i    |      | PU: no proof of presence. Ai: Sloan (2017).                               |
| **FAMILY PHASIANIDAE**               |      |     |      |      |                                                                            |
| Harlequin Quail _Coturnix delegorguei histrionica_ Hartlaub, 1849 | u    | S   |      |      | Pu: N. Borrow & R. Demey in _Bull. Afr. Bird Cl._ 5: 74, N. Borrow in _Bull. Afr. Bird Cl._ 11: 77. |
| Red-necked Francolin _Pternistis afer afer_ (Statius Müller, 1776) | i    |     |      |      | Si: tentatively first recorded in the 1980s.                              |
| Red Junglefowl _Gallus gallus_ (Linnaeus, 1758)            | i    |     |      |      |                                                                            |
| **FAMILY PHOENICOPTERIDAE**          |      |     |      |      |                                                                            |
| Greater Flamingo _Phoenicopterus roseus_ Pallas, 1811       | U    |     |      |      |                                                                            |
| Lesser Flamingo _Phoeniconaias minor_ (E. Geoffroy Saint-Hilaire, 1798) | V$^S$|     |      |      |                                                                            |
| **FAMILY COLUMBIDAE**                |      |     |      |      |                                                                            |
| Rock Dove _Columba livia livia_ J. F. Gmelin, 1789         | i    | i   |      |      |                                                                            |
| Maroon Pigeon _Columba thomensis_ Bocage, 1888             |     |     | E    |      |                                                                            |
| São Tomé Pigeon _Columba malherbii_ J. & E. Verreaux, 1851 |     |     | E    | E    |                                                                            |
| Lemon Dove _Columba larvata_ Temminck, 1809                |     |     |      |      |                                                                            |
| _C. l. inornata_ (Reichenow, 1892)                         | r    |     |      |      | Endemic _C. l. hypoleuca_ (Salvadori 1903) no longer considered valid.    |
| _C. l. principalis_ (Hartlaub, 1866)                       | S    |     |      |      |                                                                            |
| _C. l. simplex_ (Hartlaub, 1849)                          | S    |     |      |      | Sometimes treated as a species (e.g., Baptista _et al_. 1997).            |
| Laughing Dove _Streptopelia senegalensis senegalensis_ (Linnaeus, 1766) | i    | i   |      |      |                                                                            |
| São Tomé Green Pigeon _Treron sanctithomae_ (J. F. Gmelin, 1789) |     |     | E    |      |                                                                            |
| African Green Pigeon _Treron calvus virescens_ Amadon, 1953 |     |     | S    |      |                                                                            |
| **FAMILY CUCULIDAE**                  |      |     |      |      |                                                                            |
| Great Spotted Cuckoo _Clamator glandarius_ (Linnaeus, 1758) | v$^S$| V$^S$|      |      | Pv$^S$: Monteiro _et al_. (2016).                                         |
| Taxa | P | S | A | O | Reference |
|------|---|---|---|---|-----------|
| Pied Cuckoo *Clamator jacobinus* (Boddaert, 1783) | u | V<sup>s</sup> | | | PU: M. Dallimer & M. Melo in *Bull. Afr. Bird Cl* 15: 274. |
| Klaas’s Cuckoo *Chrysococcyx klaas* (Stephens, 1815) | u | | | | Su: no proof of presence. |
| African Emerald Cuckoo *Chrysococcyx cupreus insularum* Moreau & Chapin, 1951 | S | S | R | | It is unclear if the Annobón population belongs to this subspecies; additionally, the species may be monotypic (Payne 2020). |
| Common Cuckoo *Cuculus canorus* Linnaeus, 1758 / African Cuckoo *C. gularis* Stephens, 1815 | | | | | |

**FAMILY CAPRIMULGIDAE**

*Caprimulgus* sp.

**FAMILY APODIDAE**

São Tomé Spinetail *Zoonavena thomensis* (E. Hartert, 1900)

Alpine Swift *Apus melba* (Linnaeus, 1758)

Common Swift *Apus apus* (Linnaeus, 1758)

Pallid Swift *Apus pallidus* Shelley, 1870

African Swift *Apus barbatus sladeniae* (Ogilvie-Grant, 1904)

Little Swift *Apus affinis bannermani* E. Hartert, 1928

Bates’s Swift *Apus batesi* (Sharpe, 1904)

African Palm Swift *Cypsiurus parvus brachypterus* (Reichenow, 1903)

**FAMILY RALLIDAE**

African Rail *Rallus caerulescens* J. F. Gmelin, 1789

African Crake *Crex egregia* (W. Peters, 1854)

Lesser Moorhen *Paragallinula angulata* (Sundevall, 1851)

Common Moorhen *Gallinula chloropus meridonialis* (C. L. Brehm, 1831)

Allen’s Gallinule *Porphyrio alleni* Thomson, 1842

**FAMILY BURHINIDAE**

Eurasian Thick-knee *Burhinus oedicnemus* (Linnaeus, 1758)

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### FAMILY CHARADRIIDAE

| Taxa                                      | P | S | A | O | Reference                  |
|-------------------------------------------|---|---|---|---|----------------------------|
| Black-bellied Plover *Pluvialis squatarola* (Linnaeus, 1758) | vP | V5 |   |   | Pv3: Correia et al. (2021). SV5: Monteiro et al. (2016). |
| European Golden Plover *Pluvialis apricaria* (Linnaeus, 1758) | U |   |   |   |                           |
| American Golden Plover *Pluvialis dominica* (Status Müller, 1776) | vP | V5 |   |   | Pv3: Correia et al. (2021). SV5: Monteiro et al. (2016). |
| Spur-winged Lapwing *Vanellus spinosus* (Linnaeus, 1758) | vP |   |   |   | Pv3: Valle & Patacho (2014). |
| Senegal Lapwing *Vanellus lugubris* (Lesson, 1826) | vP |   |   |   |                           |
| Common Ringed Plover *Charadrius hiaticula* (Linnaeus, 1758) | vP | U |   |   | Pv3: Correia et al. (2021). |
| Little Ringed Plover *Charadrius dubius* Scopoli, 1786 | U |   |   |   |                           |
| White-fronted Plover *Charadrius marginatus* Vieillot, 1818 | vP | V5 |   |   | Pv3: ebird.org/checklist/S83661197. SV5: Monteiro et al. (2016). |

### FAMILY SCOLOPACIDAE

| Taxa                                      | P | S | A | O | Reference                  |
|-------------------------------------------|---|---|---|---|----------------------------|
| Whimbrel *Numenius phaeopus* (Linnaeus, 1758) | M | M | M |   |                           |
| Eurasian Curlew *Numenius arquata* (Linnaeus, 1758) | u |   | V5 |   |                           |
| Bar-tailed Godwit *Limosa lapponica* (Linnaeus, 1758) | U | U | U | U | SU: ebird.org/checklist/S33613204. |
| Ruddy Turnstone *Arenaria interpres* (Linnaeus, 1758) | vP | VSP |   |   | Pv3: Hall et al. (2010). SV5: B. Piot in Bull. Afr. Bird Cl. 23: 241. |
| Red Knot *Calidris canutus* (Linnaeus, 1758) | vP |   |   |   | Sv5: ebird.org/checklist/S41339760. |
| Ruff *Calidris pugnax* (Linnaeus, 1758) | u |   |   |   | Su: ebird.org/checklist/S32889474, ebird.org/checklist/S33613204. |
| Curlew Sandpiper *Calidris ferruginea* (Pontoppidan, 1763) | VSP | u |   |   | Pv3: Correia et al. (2021). Su: C. Hjort in Bull. Afr. Bird Cl. 12: 187, ebird.org/checklist/S60715447. |
| Sanderling *Calidris alba* (Pallas, 1764) | vP | vP | V5 |   | Pv3: H. Uhlig in Bull. Afr. Bird Cl. 10: 61, Valle (2018), Correia et al. (2021). SV5: H. Uhlig in Bull. Afr. Bird Cl. 10: 61, ebird.org/checklist/S49555086. |
| Pectoral Sandpiper *Calidris melanotos* Vieillot, 1818 | V5 |   |   |   | Pv5: Monteiro et al. (2016). |
| Little Stint *Calidris minutu* (Leisler, 1812) | U | U |   |   |                           |
| Great Snipe *Gallinago media* (Latham, 1787) | vP |   |   |   | Pv5: Correia et al. (2021). |
| Common Sandpiper *Actitis hypoleucos* (Linnaeus, 1758) | M | M |   |   |                           |
| Green Sandpiper *Tringa ochropus* Linnaeus, 1758 | U |   |   |   |                           |
| Common Greenshank *Tringa nebularia* (Gunnerus, 1767) | M | M |   |   |                           |
| Wood Sandpiper *Tringa glareola* (Linnaeus, 1758) | vSP |   |   |   | Sv5: reclassified as vagrant as not recorded in most years (ebird.org/species/woosan/ST-S). |

### FAMILY GLAREOLIDAE

| Taxa                                      | P | S | A | O | Reference                  |
|-------------------------------------------|---|---|---|---|----------------------------|
| Black-winged Pratincole *Glareola nordmanni* J. G. Fischer, 1842 | vS | V5 |   |   | PV5: Monteiro et al. (2016). |
| Grey Pratincole *Glareola cinerea* Fraser, 1843 | vP |   |   |   | PV5: Correia et al. (2021). |
| Taxa                                      | P | S | A | O | Reference                                                                 |
|------------------------------------------|---|---|---|---|----------------------------------------------------------------------------|
| **FAMILY STERCORARIIDAE**                 |   |   |   |   |                                                                            |
| Pomarine Jaeger Stercorarius pomarinus    | u |   |   | Su: V. Schollaert & G. Willem in Bull. Afr. Bird Cl. 7: 76.                |
| Parasitic Jaeger Stercorarius parasiticus| vP|   |   | U  | Sv*: ebird.org/checklist/514846065.                                        |
| Long-tailed Jaeger Stercorarius longicaudus|   |   |   | U  |                                                                            |
| **FAMILY LARIDAE**                        |   |   |   |   |                                                                            |
| Sabine’s Gull Xema sabini (Sabine, 1819)  | U | U | U | U  | Pu: ebird.org/checklist/S68133545.                                         |
| Lesser Black-backed Gull Larus fuscus     | U | U |   | Su: A. Gascoigne in Bull. Afr. Bird Cl. 11: 177.                           |
| Brown Noddy Anous stolidus stolidus       | B | B | B |    |                                                                            |
| Black Noddy Anous minutus atlanticus     | B | ? | B |    | S?: breeding possible but not confirmed. An aberrant yellow-legged individual of the local breeding population was photographed on Tinhosas (Demey & da Rocha in press). |
| Sooty Tern Onychoprion fuscatus fuscatus  | B | ? | ? |    | S? & A?: breeding possible but not confirmed.                              |
| Bridled Tern Onychoprion anaeathetus      | ? | ? | B |    | P? & S?: breeding possible but not confirmed.                               |
| Black Tern Chlidonias niger (Linnaeus, 1758)|   |   |   | U  | Su: ebird.org/checklist/S32779735.                                        |
| White-winged Tern Chlidonias leucopterus  | u |   |   |    | Au: single record in Fry (1961) but no supporting evidence.               |
| Common Tern Sterna hirundo Linnaeus, 1758 | U | U |   |    | Pu: ebird.org/checklist/S10327997. Su: C. Hjort in Bull. Afr. Bird Cl. 12: 187, ebird.org/checklist/S10328000. |
| Arctic Tern Sterna paradisaea Pontoppidan, 1763 | U | U   |   |    | Su: A. Gascoigne in Bull. Afr. Bird Cl. 11: 177.                           |
| Royal Tern Thalasseus maximus (Boddaert, 1783) | u |   |   | U  | Su: ebird.org/checklist/S60715447.                                        |
| Sandwich Tern Thalasseus sandvicensis (Latham, 1787) | u | vS |   |    | Pu: ebird.org/checklist/S68133545. Sv*: reclassified as vagrant since most years it is not recorded (ebird.org/species/santer1/ST-S). |
| **FAMILY PHAETHONTIDAE**                  |   |   |   |   |                                                                            |
| White-tailed Tropicbird Phaethon lepturus  | B | B | B |    |                                                                            |
| Red-billed Tropicbird Phaethon aetherus   | ? | vP|   |    | P?: S. J. Rumsey in Bull. Afr. Bird Cl. 8: 46, ebird.org/checklist/S6591443, P. Catry saw one on Tinhosas in 2020, and in 2021 N. Rocha saw the species on a nest, suggesting that it might breed sporadically. Sv*: L. Sineux in Bull. Afr. Bird Cl. 27: 114. |
| **FAMILY OCEANITIDAE**                    |   |   |   |   |                                                                            |
| Wilson’s Storm Petrel Oceanites oceanicus | U |   |   |    |                                                                            |
| Black-bellied Storm Petrel Frogetta tropica| u | u   |   | U  | Pu: V. Schollaert & G. Willem in Bull. Afr. Bird Cl. 7: 76. Su: ebird.org/checklist/S57214304. |
| **FAMILY HYDROBATIDAE**                   |   |   |   |   |                                                                            |
| European Storm Petrel Hydrobates pelagicus| U |   |   |    | Ou: N. Borrow in Bull. Afr. Bird Cl. 8: 65.                                |
| Taxa                                   | P | S | A | O | Reference                                                                 |
|----------------------------------------|---|---|---|---|----------------------------------------------------------------------------|
| Leach’s Storm Petrel *Oceanodroma leucorhoa* (Vieillot, 1818) |   |   |   | U |                                                                             |
| Band-rumped Storm Petrel *Oceanodroma castro* (Harcourt, 1851) | ? | U | M | S | V. Schollaert & G. Willem in Bull. Afr. Bird Cl. 7: 76, ebird.org/checklist/S57025283, ebird.org/checklist/S57214304. Om: N. Borrow in Bull. Afr. Bird Cl. 8: 65 and 9: 70. Breeding on São Tomé is likely but not confirmed (Flood et al. 2019). Possibly *O. jabejabe* or an undescribed form. |

**FAMILY PROCELLARIIDAE**

| Taxa                                   | P | S | A | O | Reference                                                                 |
|----------------------------------------|---|---|---|---|----------------------------------------------------------------------------|
| Bulwer’s Petrel *Bulweria bulwerii* Jardine & Selby, 1828 |   |   |   | U |                                                                             |
| Cory’s Shearwater *Calonectris diomedea* (Scopoli, 1769) | u | U |   | Pu: ebird.org/checklist/S20636314. The possibility of a Cape Verde Shearwater *C. edwardsii* could not be discarded. |
| Great Shearwater *Ardenna gravis* (O’Reilly, 1818) |   |   |   | U |                                                                             |
| Sooty Shearwater *Ardenna grisea* (J. F. Gmelin, 1789) | V | P |   | Pu: ebird.org/checklist/S10327997. |
| Little Shearwater *Puffinus assimilis* Gould, 1838 |   |   |   | U |                                                                             |

**FAMILY CICONIIDAE**

| Taxa                                   | P | S | A | O | Reference                                                                 |
|----------------------------------------|---|---|---|---|----------------------------------------------------------------------------|
| White Stork *Ciconia ciconia* (Linnaeus, 1758) | V | S | P | SV | A. Gascoigne in Bull. Afr. Bird Cl. 15: 135. |
| Yellow-billed Stork *Mycteria ibis* (Linnaeus, 1766) | u |   |   |   |                                                                             |

**FAMILY FREGATIDAE**

| Taxa                                   | P | S | A | O | Reference                                                                 |
|----------------------------------------|---|---|---|---|----------------------------------------------------------------------------|
| Ascension Frigatebird *Fregata aquila* (Linnaeus, 1758) | U |   |   | U |                                                                             |
| Magnificent Frigatebird *Fregata magnificens* Mathews, 1914 | v | P |   | Pv | Matilde & de Lima (2016), Correia et al. (2021). |

**FAMILY SULIDAE**

| Taxa                                   | P | S | A | O | Reference                                                                 |
|----------------------------------------|---|---|---|---|----------------------------------------------------------------------------|
| Masked Booby *Sula dactylatra* Lesson, 1831 | v | S | P | U | u | Pv | Monteiro et al. (2016), Pv | ebird.org/checklist/S6591443. |
| Brown Booby *Sula leucogaster* leucogaster (Boddaert, 1783) | B | B | ? | A? | breeding possible but not confirmed. |
| Red-footed Booby *Sula sula* (Linnaeus, 1766) | u | V | P | Pu | ebird.org/checklist/S39180120. Sv | ebird.org/checklist/S80241954. |
| Cape Gannet *Morus capensis* (M. H. C. Lichtenstein, 1823) | U | U |   |   |                                                                             |

**FAMILY PHALACROCORACIDAE**

| Taxa                                   | P | S | A | O | Reference                                                                 |
|----------------------------------------|---|---|---|---|----------------------------------------------------------------------------|
| Long-tailed Cormorant *Microcarbo africanus africanus* (J. F. Gmelin, 1789) | v | R |   | P | ebird.org/checklist/S63580421. |
| Great Cormorant *Phalacrocorax carbo* (Linnaeus, 1758) | U | U |   |   |                                                                             |

**FAMILY ARDEIDAE**

| Taxa                                   | P | S | A | O | Reference                                                                 |
|----------------------------------------|---|---|---|---|----------------------------------------------------------------------------|
| Little Bittern *Ixobrychus minutus* (Linnaeus, 1766) | ? |   |   |   | P?: breeding confirmed on Principe but no subsequent records. |
| Grey Heron *Ardea cinerea* Linnaeus, 1758 |   | V | P |   | Pu: V. Schollaert & G. Willem in Bull. Afr. Bird Cl. 7: 76, N. Borrow in Bull. Afr. Bird Cl. 10: 137. SV | ebird.org/checklist/S63841541. |
| Black-headed Heron *Ardea melanocephala* (Children & Vigors, 1826) | v | P |   |   | Pv | Cheke & Pereira (2020), Sv | B. Piot in Bull. Afr. Bird Cl. 23: 241. |

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| Taxa                                      | P | S | A | O | Reference                                                                 |
|------------------------------------------|---|---|---|---|---------------------------------------------------------------------------|
| Purple Heron *Ardea purpurea* (Linnaeus, 1766) | V | S | A | O | SV<sup>5</sup>: Monteiro *et al.* (2016).                                |
| Great Egret *Ardea alba* Linnaeus, 1758   | U |   |   |   | SU: ebird.org/checklist/S51768645.                                       |
| Intermediate Egret *Ardea intermedia* A. E. Brehm, 1854 | u | v |   |   | Pu: M. Melo in *Bull. Afr. Bird Cl.* 11: 77, Sv<sup>5</sup>: Hall *et al.* (2010). |
| Little Egret *Egretta garzetta* (Linnaeus, 1766) | v |   | U |   | Pv<sup>5</sup>; Hall *et al.* (2010). SU: ebird.org/species/litegr/ST-S.   |
| Western Reef Heron *Egretta gularis gularis* (Bosc, 1792) | R | R | R |   | AR: Sloan (2017).                                                         |
| Black Heron *Egretta ardea* (Wagler, 1827) | u | V |   |   | Pu: Y. Santos described a black heron using its wings to form a canopy for feeding. |
| Cattle Egret *Bubulcus ibis ibis* (Linnaeus, 1758) | r | r | u |   | Pr & Sr: present year-round (ebird.org/species/categ/ST-P, ebird.org/species/categ/ST-S). Au: no proof of presence. |
| Squacco Heron *Ardeola ralloides* (Scopoli, 1769) | v | v | v |   | Pv<sup>5</sup>; Valle (2017), Correia *et al.* (2021), ebird.org/checklist/S63580421. Sv<sup>5</sup>: ebird.org/checklist/S26063168, ebird.org/checklist/S80242124. Av<sup>5</sup>: Sloan (2017). |
| Striated Heron *Butorides striata atricapilla* (Afzelius, 1804) | R | R | V |   |                                                                                  |
| Black-crowned Night Heron *Nycticorax nycticorax* (Linnaeus, 1758) | U |   |   |   |                                                                                  |
| FAMILY THRESKIORNITHIDAE                   |   |   |   |   |                                                                                  |
| Olive Ibis *Bostrychia olivacea rothschildii* (Bannerman, 1919) | x |   |   |   | Px: last confirmed sighting in 1901 by Leonardo Fea (Salvadori 1903). We consider two reports from the 1990s (Jones & Tye 2006) unsubstantiated. This subspecies is probably extinct, especially as island-wide surveys since the early 2000s have failed to find it. |
| São Tomé Ibis *Bostrychia bocagei* (Chapin, 1923) | E |   |   |   |                                                                                  |
| FAMILY PANDIONIDAE                        |   |   |   |   |                                                                                  |
| Osprey *Pandion haliaetus* (Linnaeus, 1758) | v |   |   |   | Pv<sup>5</sup>; ebird.org/checklist/S63580421.                                |
| FAMILY ACCIPITRIDAE                       |   |   |   |   |                                                                                  |
| Bat Hawk *Macheiramphus alcinus* Bonaparte, 1850 | u |   |   |   | Su: H. Uhlig in *Bull. Afr. Bird Cl.* 10: 61.                                |
| Black Kite *Milvus migrans parasitus* (Daudin, 1800) | R | R | V |   |                                                                                  |
| FAMILY TYTONIDAE                          |   |   |   |   |                                                                                  |
| Barn Owl *Tyto alba thomensis* (Hartlaub, 1852) | S |   |   |   | SS: might be best treated as an endemic species (Uva *et al.* 2018, Alves 2019). |
| FAMILY STRIGIDAE                          |   |   |   |   |                                                                                  |
| São Tomé Scops Owl *Otus hartlaubi* (Giebel, 1849) | E |   |   |   |                                                                                  |
| African Scops Owl *Otus senegalensis feae* (Salvadori, 1903) | S |   |   |   | AS: Sloan (2017). Ongoing debate on taxonomic status (e.g., Freitas 2019 and Billerman *et al.* 2020 vs. Collar & Boesman 2020 and Gill *et al.* 2021). |
| *Otus* sp. nov.                           | e |   |   |   | Pe: Freitas 2019.                                                            |
| FAMILY UPUPIDAE                           |   |   |   |   |                                                                                  |
| Eurasian Hoopoe *Upupa epops* Linnaeus, 1758 | v |   |   |   | Sv<sup>5</sup>; A. Gascoigne in *Bull. Afr. Bird Cl.* 11: 77.              |
| Taxa | P | S | A | O | Reference |
|------|---|---|---|---|-----------|
| **FAMILY ALCEDINIDAE** |   |   |   |   |           |
| Malachite Kingfisher *Corythornis cristatus* (Pallas, 1764) |   |   |   |   |           |
| C. *c. thomensis* (Salvadori, 1902) | S |   |   |   |           |
| C. *c. nais* (Kaup, 1848) | S |   |   |   |           |
| Blue-breasted Kingfisher *Halcyon malimbica* dyras Hartlaub, 1854 | S |   |   |   |           |
| Kingfisher *Halcyon* sp. | u |   |   |   |           |
| Pied Kingfisher *Ceryle rudis* (Linnaeus, 1758) | ? | U |   |   |           |

**FAMILY MEROPIDAE**

| Merops sp. |   |   |   |   |           |

**FAMILY CORACIIDAE**

| European Roller *Coracias garrulus* Linnaeus, 1758 | V^S | V^S |   |   |           |
| Broad-billed Roller *Eurystomus glaucus* (Staitus Müller, 1776) | v^p |   |   |   |           |

**FAMILY FALCONIDAE**

| Common Kestrel *Falco tinnunculus* Linnaeus, 1758 | U |   |   |   |           |
| Red-footed Falcon *Falco vespertinus* Linnaeus, 1766 | v^p | V^NP |   |   |           |
| Lanner Falcon *Falco biarmicus* Temminck, 1825 | u |   |   |   |           |
| Peregrine Falcon *Falco peregrinus* Tunstall, 1771 | U |   |   |   |           |

**FAMILY PSITTACULIDAE**

| Red-headed Lovebird *Agapornis pullarius pullarius* (Linnaeus, 1758) | X | i |   |   |           |

**FAMILY PSITTACIDAE**

| Grey Parrot *Psittacus erithacus* Linnaeus, 1758 | R | i |   |   |           |

**FAMILY ORIOLIDAE**

| Eurasian Golden Oriole *Oriolus oriolus* (Linnaeus, 1758) | V^S | v^P |   |   |           |
| São Tomé Oriole *Oriolus crassirostris* Hartlaub, 1857 | E |   |   |   |           |

**FAMILY DICRURIDAE**

| Velvet-mantled Drongo *Dicrurus modestus modestus* Hartlaub, 1849 | s |   |   |   |           |

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| Taxa | P | S | A | O | Reference |
|------|---|---|---|---|-----------|
| **FAMILY MONARCHIDAE** | | | | | |
| São Tomé Paradise Flycatcher *Terpsiphone atrochalybeia* (Thomson, 1842) | | | E | | |
| Black-headed Paradise Flycatcher *Terpsiphone rufiventris smithii* (Fraser, 1843) | s | | | | Previously treated as an endemic species, *T. smithii*.
| **Family LANIIDAE** | | | | | |
| Red-backed Shrike *Lanius collurio* Linnaeus, 1758 | u | | V^R | | |
| Lesser Grey Shrike *Lanius minor* J. F. Gmelin, 1788 | V^S | u | | PV^S: Monteiro et al. (2016). |
| Newton’s Fiscal *Lanius neumoni* Bocage, 1891 | E | | | | |
| **FAMILY CISTICOLIDAE** | | | | | |
| Chattering Cisticola *Cisticola anonymus* (J. W. von Müller, 1855) | - | | | | |
| São Tomé Prinia *Prinia molleri* Bocage, 1887 | E | | | | |
| **FAMILY ACROCEPHALIDAE** | | | | | |
| Western Olivaceous Warbler *Iduna cf. opaca* (Cabanis, 1850) | v^P | | | | PV^P: Correia et al. (2021). |
| Sedge Warbler *Acrocephalus schoenobaenus* (Linnaeus, 1758) | v^R | | | | Sv^P: S. Andersson in Bull. Afr. Bird Cl. 11: 77, safring.birdmap.africa/ring_info.php?ring=GA70214, safring.birdmap.africa/ring_info.php?ring=GA70215. |
| Great Reed Warbler *A. arundinaceus* (Linnaeus, 1758) | v^A | | | | Sv^A: B. Piot in Bull. Afr. Bird Cl. 23: 241. |
| **FAMILY HIRUNDINIDAE** | | | | | |
| Banded Martin *Riparia cincta* (Boddaert, 1783) | V^S | | | | |
| Sand Martin *Riparia riparia* (Linnaeus, 1758) | u | | | | Pu: Mills et al. (2007). |
| Barn Swallow *Hirundo rustica* (Linnaeus, 1758) | V^SR | V^SP | | | PV^P: Monteiro et al. (2016). Sv^P: ebird.org/checklist/S14845048. Considered vagrant also on São Tomé, as not recorded most years (ebird.org/species/barswa/ST-S). |
| Lesser Striped Swallow *Cecropis abyssinica* (Guérin-Méneville, 1843) | u | | | | Pu: H. Uhlig in Bull. Afr. Bird Cl. 10: 61. |
| Common House Martin *Delichon urbicum* (Linnaeus, 1758) | V^S | v^P | | | Sv^P: ebird.org/checklist/S49555067. |
| Grey-rumped Swallow *Pseudhirundo griseopyga* (Sundevall, 1850) | U | u | | | Su: P. Christy in Bull. Afr. Bird Cl. 18: 102, ebird.org/checklist/S24605216. |
| **FAMILY PHYLLOSOCIDAE** | | | | | |
| Willow Warbler *Phylloscopus trochilus* (Linnaeus, 1758) | v^P | u | | | Pu^P: ebird.org/checklist/S32876010. Su: ebird.org/checklist/S16448286, ebird.org/checklist/S54165131. |
| **FAMILY SYLVIIDAE** | | | | | |
| Dohrn’s Thrush-Babbler *Sylvia dohrni* (Hartlaub, 1866) | E | | | | Formerly included in the endemic monospecific genus *Horizorhinus*. |
| Garden Warbler *Sylvia borin* (Boddaert, 1783) | v^P | u | V^S | | PV^P: ebird.org/checklist/S42176347. Su: C. Hjort in Bull. Afr. Bird Cl. 12: 187, ebird.org/checklist/S16448286, ebird.org/checklist/S54165131. |
| Taxa | P | S | A | O | Reference |
|------|---|---|---|---|-----------|
| Common Whitethroat *Sylvia communis* Latham, 1787 | v<sup>R</sup> | | | | Pr<sup>V</sup>: safring.birdmap.africa/ring_info.php?ring=GA59510, safring.birdmap.africa/ring_info.php?ring=GA59517. |

**FAMILY ZOSTEROPIDAE**

| Príncipe White-eye *Zosterops ficedulinus* Hartlaub, 1866 | E | | | | Previously treated as an endemic subspecies of *Z. ficedulinus*. |
| Annobón White-eye *Zosterops griseoventers* Bocage, 1893 | E | | | | |
| São Tomé White-eye *Zosterops feae* Salvadori, 1901 | E | | | | Previously treated as an endemic subspecies of *Z. ficedulinus*. |
| Black-capped Speirops *Zosterops lugubris* (Hartlaub, 1848) | E | | | | Formerly included in the genus *Speirops*, endemic to the Cameroon line of volcanoes, which is no longer considered valid. |
| Príncipe Speirops *Zosterops leucophaeus* (Hartlaub, 1857) | E | | | | Formerly included in the genus *Speirops*, endemic to the Cameroon line of volcanoes, which is no longer considered valid. |

**FAMILY STURNIDAE**

| Chestnut-winged Starling *Onychognathus fulgidus fulgidus* (Hartlaub, 1849) | S | | | | |
| Splendid Starling *Lamprotornis splendidus* (Vieillot, 1822) | r | | | | Pr: ebird.org/species/spgsta1/ST. Frequent throughout the year. |
| Príncipe Starling *Lamprotornis ornatus* (Daudin, 1800) | E | | | | |

**FAMILY TURDIDAE**

| Príncipe Thrush *Turdus xanthorhynchus* Salvadori, 1901 | e | | | | Previously treated as an endemic subspecies of *T. olivaceofuscus*. |
| São Tomé Thrush *Turdus olivaceofuscus* Hartlaub, 1852 | E | | | | |

**FAMILY MUSCICAPIDAE**

| Spotted Flycatcher *Muscicapa striata* (Pallas, 1764) | V<sup>Sp</sup> | u | V<sup>s</sup> | u | PV<sup>V</sup>: Monteiro et al. (2016). PV<sup>V</sup>: Correia et al. (2021). SU: ebird.org/checklist/S14846119, ebird.org/checklist/S35796350. |
| Common Nightingale *Luscinia megarhynchos* (C. L. Brehm, 1831) | v<sup>A</sup> | | | | Sv<sup>V</sup>: ebird.org/checklist/S54165131. |
| Whinchat *Saxicola rubetra* (Linnaeus, 1758) | V<sup>S</sup> | u | | | PV<sup>V</sup>: Hall et al. (2010), Correia et al. (2021). Su: ebird.org/checklist/S18824617. |
| Northern Wheatear *Oenanthe oenanthe* (Linnaeus, 1758) | v<sup>P</sup> | | | | PV<sup>V</sup>: Correia et al. (2021). |
| Isabelline Wheatear *Oenanthe isabellina* (Temminck, 1829) | u | | | | Su: C. Hjort in Bull. Afr. Bird Cl. 12: 187. |

**FAMILY NECTARINIIDAE**

| Príncipe Sunbird *Anabathmis hartlaubii* (Hartlaub, 1857) | E | | | | |
| Newton’s Sunbird *Anabathmis newtonii* (Bocage, 1887) | E | | | | |
| São Tomé Sunbird *Dreptes thomensis* (Bocage, 1889) | E | | | | |
| Olive Sunbird *Cyanomitra olivacea cephalis* (Bates, 1930) | R | | | | |
| Taxa | P | S | A | O | Reference |
|------|---|---|---|---|-----------|
| **FAMILY PLOCEIDAE** | | | | | |
| Príncipe Golden Weaver *Ploceus princeps* (Bonaparte, 1851) | E | | | | |
| Southern Masked Weaver *Ploceus velatus* Vieillot, 1819 | i | | | | Endemic *P. v. peixotoi* (Frade & Naurois, 1964) no longer considered valid. |
| Vitelline Masked Weaver *Ploceus vitellinus* (M. H. C. Lichtenstein, 1823) | - | | | | In the past considered conspecific with *P. velatus* and, as such, was sometimes listed for São Tomé under this name. |
| Village Weaver *Ploceus cucullatus* (Statius Müller, 1766) | i | | | | |
| Giant Weaver *Ploceus grandis* (G. R. Gray, 1844) | E | | | | |
| São Tomé Weaver *Ploceus sanctithomae* (Hartlaub, 1848) | E | | | | |
| Red-headed Quelea *Quelea erythrops* (Hartlaub, 1848) | X | ? | | | S?: Monteiro et al. (2016), ebird.org/species/rehque1/ST. No records March–June, so it might be either resident or a breeding migrant. |
| Red-billed Quelea *Quelea quelea* (Linnaeus, 1758) | U | | | | |
| Black-winged Bishop *Euplectes hordeaceus* (Linnaeus, 1758) | i | | | | |
| Golden-backed Bishop *Euplectes aureus* (J. F. Gmelin, 1789) | i | | | | Endemic to Angola with a resident population on São Tomé. |
| White-winged Widowbird *Euplectes albonotatus asymmetrurus* (Reichenow, 1892) | i | | | | |
| **FAMILY ESTRILDIDAE** | | | | | |
| Chestnut-breasted Nigrita *Nigrita bicolor brunneescens* Reichenow, 1902 | R | | | | |
| Cinderella Waxbill *Estrilda thomensis* (de Sousa, 1888) | ? | | | | S?: single record from 1887 considered vagrant or escapee. |
| Common Waxbill *Estrilda astrild jagoensis* Alexander, 1898 | i | i | | | Pi & Si: Billerman et al. (2020). |
| Southern Cordon-bleu *Uraeginthus angolensis angolensis* (Linnaeus, 1758) | i | | | | |
| Red-billed Firefinch *Lagonosticta senegala* (Linnaeus, 1766) | ? | | | | P?: Monteiro et al. (2016). Single record from 1970, which might refer to a vagrant or escapee. |
| Bronze Mannikin *Spermestes cucullata cucullata* (Swainson, 1837) | i | i | | | Pi & Si: Leventis & Olmos (2009). |
| **FAMILY VIDUIDAE** | | | | | |
| Pin-tailed Whydah *Vidua macroura* (Pallas, 1764) | U | i | | | PU: ebird.org/checklist/S45937385. Si: Leventis & Olmos (2009). |
| Eastern Paradise Whydah *Vidua paradisaea* (Linnaeus, 1758) | ? | | | | S?: two records, the most recent from 1909, either vagrant, introduced or escaped birds. |
| **FAMILY MOTACILLIDAE** | | | | | |
| São Tomé Short-tail *Motacilla bocagii* (Sharpe, 1892) | E | | | | Formerly included in the endemic monospecific genus *Amaurocichla*. |
| Western Yellow Wagtail *M. flava* Linnaeus, 1758 | v^p | u | | | P^v^p: Hall et al. (2010). Su: ebird.org/checklist/S18824617. *M. f. thunbergii* is unconfirmed on Príncipe (ebird.org/checklist/S17866672). |
| White Wagtail *M. alba* Linnaeus, 1758 | v^p | | | | P^v^p: ebird.org/checklist/S75550610. |
| Motacilla sp. | U | | | | Probably *M. alba*. |
Following these criteria, we confirmed the occurrence of 146 species (Tables 1–2), an increase of 28 versus the previous checklist (Jones & Tye 2006). These include 66 resident landbird species, of which 29 are endemic, including three that occur on more than one island (São Tomé Pigeon Columba malherbii, São Tomé Spinetail Zoonavena thomensis and Principe Seedeeater Crithagra rufobrunnea). Recent changes in the list of resident species include the recognition of the extinction of the Principe subspecies of Olive Ibis Bostrychia olivacea rothschildi, the discovery of a scops owl Otus sp. nov. on Principe, the recognition of Splendid Starling Lamprotornis splendidus as a resident species, the elevation to species level of Principe Thrush Turdus xanthorhynchus and São Tomé White-eye Zosterops feae, the downgrading to subspecies of Principe Drongo (now Velvet-mantled Drongo,Dicrurus modestus modestus) and Annobón Paradise Flycatcher (now Black-headed Paradise Flycatcher Terpsiphone rufiventer smithii), and reassignment of the Corythornis kingfisher on Principe to Malachite Kingfisher as C. cristatus natis (previously considered a subspecies of White-bellied Kingfisher C. leucogaster). Among resident species we highlight 17 as possibly non-native. The list of breeding seabirds has not changed. There are now just four regular non-breeding migrant birds, with Sanderling Calidris alba, Wood Sandpiper Tringa glareola and Sandwich Tern Thalasseus sandvicensis considered vagrants due to the paucity of records. Eight species are of uncertain status, one fewer than the previous checklist, with the addition of Red-billed Tropicbird Phaethon aethereus and Red-billed Firefinch Lagonosticta senegala, but the formerly ‘uncertain’ Klaas’s Cuckoo Chrysococcyx klaas and Alpine Swift Apus melba are now unconfirmed, and Splendid Starling is now resident. There are 62 vagrants, with documentation of eight species that were previously unconfirmed, 20 newly recorded, and the downgrading of three that were previously considered regular non-breeding migrants (see above), whilst three species formerly considered vagrants are now treated as unconfirmed. The 31 newly confirmed species were documented by photographs (n = 27), ringing (n = 2) and geolocator records (n = 1), specimens (n = 4) and sound-recordings (n = 1). The number of unconfirmed species increased from 45 to 51, a net gain of six, although 11 were confirmed (one uncertain, one endemic and nine vagrants), whereas 17 were added to the unconfirmed list (two previously uncertain, three previously considered vagrant and 12 new records). The number of endemic subspecies decreased from 21 to 17 due to the confirmed extinction of the Principe subspecies of Olive Ibis and taxonomic rearrangements (the Annobón subspecies of Lemon Dove C. l. hypoleuca is no
longer recognised, and there were four upgrades to, and two downgrades from, endemic species).

We list 90 confirmed species for Príncipe, an increase of 25 on the previous checklist, including 32 resident landbirds, of which 11 are endemic and five possibly non-native. New single-island endemics include the recently split Principe Thrush and Príncipe White-eye Zosterops ficedulinus, and the as yet undescribed Otus on Príncipe. On the other hand, Principe Drongo was downgraded to an endemic subspecies. Other recent changes among resident landbirds include treating as extinct the subspecies of Olive Ibis but the addition of Splendid Starling, whilst Red-billed Tropicbird was moved to the list of species of uncertain status. There are now 44 vagrant and 30 unconfirmed species, representing increases of 24 and seven, respectively. There are nine endemic subspecies, a decrease of two on the previous checklist, resulting from one extinction, two upgrades to species, and one downgrade to subspecies.

We list 96 confirmed species for São Tomé, an increase of four on the last checklist, including 50 resident landbirds, of which 20 endemic and 17 possibly non-native. São Tomé Thrush and São Tomé White-eye are recognised as single-island endemic species, Grey Parrot Psittacus erithacus as resident, and Klaas’s Cuckoo is moved from uncertain status to unconfirmed. There are 32 vagrants and 45 unconfirmed species, representing increases of nine and 12, respectively.

Thirty species were confirmed for Annobón, the same number as the previous checklist, including 11 resident landbirds, of which two are endemic and three possibly non-native. Recent changes included the downgrading of Annobón Paradise Flycatcher to subspecies, confirmation that Common Moorhen is not extirpated, and removal of Cattle Egret Bubulcus ibis from uncertain status to unconfirmed. There are 11 vagrant and ten unconfirmed species, representing increases of two and six, respectively.

The resident avifauna includes 13 globally threatened species (IUCN 2020), including four that are Critically Endangered (São Tomé Ibis Bostrychia bocagei, São Tomé Fiscal Lanius newtoni, Principe Thrush and São Tomé Grosbeak Crithagra concolor), four Endangered (Maroon Pigeon Columba thomensis, São Tomé Green Pigeon, Grey Parrot and Principe White-eye) and five Vulnerable (São Tomé Scops Owl Otus hartlaubi, São Tomé Oriole Oriolus crassirostris, Annobón White-eye Zosterops griseovirescens, Giant Sunbird Dreptes thomensis and São Tomé Short-tail Motacilla bocagii). All but Grey Parrot are endemic, meaning that 41% of the endemic species are threatened. Additionally, the Annobón subspecies of African Scops Owl Otus senegalensis feae, considered by some authorities as a valid species (Collar & Boesman 2020, Gill et al. 2021), has been assessed as Critically Endangered. Likewise, the as yet undescribed Otus on Principe is also likely to meet one or more of the criteria for the latter category (Freitas 2019). Three species are Near Threatened (São Tomé Pigeon, São Tomé White-eye and Giant Weaver Ploceus grandis).

Concluding remarks

We report 146 confirmed bird species for the oceanic islands of the Gulf of Guinea, including 66 resident landbirds, of which 29 are endemic species, 17 are endemic subspecies, and 17 are possibly non-native. Additionally, there are six breeding seabirds, four regular non-breeding migrant birds, eight species of uncertain status, 62 vagrants, and 51 unconfirmed species. Confirmed species have increased by 28 since the previous checklist (Jones & Tye 2006), or an increase of 19% in just 15 years. Most of these are doubtless attributable to the larger number of ornithologists and birders visiting the islands in recent years, whilst the platforms to report sightings have become more diverse and easily accessible. However, a few changes have resulted from our review of historical
records, and changes in taxonomy, most of the latter resulting from the application of molecular techniques. A striking number of changes refer to the avifauna of Principe.

We expect that more species will be reported in the next few decades. Most are likely to involve the confirmation of vagrants that are currently unconfirmed, but further molecular work is also likely to modify the taxonomic status of a few resident species. Although some of the unconfirmed species probably do occur in the region, others are less likely and might reflect misidentifications of similar species, e.g., Long-tailed Skua Stercorarius longicaudus and Isabelline Wheatear Oenanthe isabellina. Therefore, the number of unconfirmed species must be interpreted carefully. The avifauna of Annobón is the most poorly known, although any additions will probably be vagrants. We also expect that the number of species of uncertain status will decline. Regrettably, it is also expected that the number of non-native species will increase (Reino et al. 2017). Promoting birdwatching and the use of existing reporting tools locally has huge potential to clarify statuses that remain unclear, with the side benefit of also raising environmental awareness.

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References:
Åkesson, S., Klaassen, R., Holmgren, J., Fox, J. W. & Hedenström, A. 2012. Migration routes and strategies in a highly aerial migrant, the Common Swift Apus apus, revealed by light-level geolocators. PLoS ONE 7: e41195.
Alves, J. M. G. da C. 2019. Taxonomia, ecologia e conservação da coruja-das-torres de São Tomé (Tyto alba thomensis). M.Sc. thesis. Faculdade de Ciências da Universidade de Lisboa.
Billerman, S. M., Keeney, B. K., Rodewald, P. G. & Schulenberg, T. S. (eds.) 2020. Birds of the world. Cornell Laboratory of Ornithology, Ithaca, NY. www.birdsoftheworld.org (accessed 22 October 2020).
BirdLife International. 2019. ECOFAC 6 São Tomé e Príncipe – relatório annual 2018. Unpubl. report. BirdLife International, São Tomé.
BirdLife International. 2020a. The world database of Key Biodiversity Areas. www.keybiodiversityareas.org (accessed 22 October 2020).
BirdLife International. 2020b. Important Bird Areas factsheet: Parque Natural Obô de São Tomé e Zona Tampão. www.birdlife.org (accessed 22 October 2020).
van Boekel, M. 2016. First record of Eurasian Golden Oriole Oriolus oriolus for São Tomé Island, São Tomé and Principe. Bull. Afr. Bird Cl. 23: 229–230.
Baptista, L. F., Trail, P. W. & Horblit, H. M. 1997. Family Columbidae (pigeons and doves). Pp. 60–243 in del Hoyo, J., Elliott, A. & Sargatal, J. (eds.) Handbook of the birds of the world, vol 4. Lynx Edicions, Barcelona.
Boix, C. 2010. Sao Tome and Principe: Gulf of Guinea island endemics. Tropical Birding.
Buchanan, G. M., Donald, P. F. & Butchart, S. H. M. 2011. Identifying priority areas for conservation: a global assessment for forest-dependent birds. PLoS ONE 6: e29080.
Cheke, A. S. & Pereira, T. F. O. 2020. First record of Black-headed Heron Ardea melanocephala for Principe, with other noteworthy sightings from São Tomé and Principe. Bull. Afr. Bird Cl. 27: 91–93.
Chou, S. C., Lyra, A. A., Gomes, J. L., Rodriguez, D. A., Martins, M. A., Resende, N. C., Tavares, P. S., Dereczynski, C. P., Pliotto, I. L., Martins, A. M., Carvalho, L. F. A., Onofre, J. L. L., Major, I., Penhor, M. & Santana, A. 2020. Downscaling projections of climate change in Sao Tome and Principe Islands, Africa. Climate Dynamics 54: 4021–4042.
Christy, P. & Clarke, W. V. 1998. Guide des oiseaux de São Tomé et Principe. ECOFAC, São Tomé.
Clements, J. F., Schulenberg, T. S., Iliff, M. J., Billerman, S. M., Fredericks, T. A., Sullivan, B. L. & Wood, C. L. 2019. The eBird/Clements checklist of birds of the world: v2019. www.birds.cornell.edu/clementschecklist/download/ (accessed 10 April 2020).
Collar, N. J. & Boesman, P. 2020. The taxonomic status of Annobón Scops Owl Otus feae and Arabian Scops Owl O. pamelae. Bull. Afr. Bird Cl. 27: 159–167.
Collar, N. J. & Stuart, S. N. 1988. Key forests for threatened birds in Africa. Monogr. 3. International Council for Bird Preservation, Cambridge, UK.
Correia, E., Correia, B. & de Lima, R. F. 2021. Noteworthy records from Principe Island (São Tomé and Principe, Gulf of Guinea). Malimbus 43: 24–33.
Demey, R. & da Rocha, N. in press. Photospot: Black Noddy Anous minutus with orange legs on Príncipe. Bull. Afr. Bird Cl. 28.

Direção Geral do Ambiente. 2006a. Lei do Parque Natural Obô de São Tomé: lei n.º 6 / 2006. Ministério dos Recursos Naturais e Ambiente, São Tomé e Príncipe.

Direção Geral do Ambiente. 2006b. Lei do Parque Natural Obô do Príncipe: lei n.º 7 / 2006. Ministério dos Recursos Naturais e Ambiente, São Tomé e Príncipe.

Flood, R. L., de Lima, R. F., Melo, M., Verbelen, P., & Wagstaff, W. H. 2019. What is known about the enigmatic Gulf of Guinea band-rumped storm petrels Hydrobates cf. castro? Bull. Brit. Orn. Cl. 139: 173–186.

Freitas, B. B. 2019. The mystery scops owl of Príncipe Island: combining evidence for a species description and assessment of its conservation status. M.Sc. thesis. Faculdade de Ciências da Universidade do Porto.

Fry, C. H. 1961. Notes on the birds of Annobón and other islands in the Gulf of Guinea. Ibis 103a: 267–276.

Fundação Príncipe. 2019. Understanding the remarkable biodiversity of Príncipe Island – scientific report. Fundação Príncipe, Santo António.

Gill, F., Donsker, D. & Rasmussen, P. (eds.) 2021. IOC world bird list. Version 11.1. www.worldbirdnames.org (accessed 27 February 2021).

Hall, P., Leventis, A. P., Olmos, F., Rumsey, S. & Turshak, L. 2010. Noteworthy bird records from São Tomé and Príncipe. Bull. Afr. Bird Cl. 17: 93–96.

Hansson, B. & Thomasson, A. 2014. Records of African Pygmy Goose Nettapus auritus and a Halcyon kingfisher on São Tomé. Malimbus 36: 116–117.

Henriques, J. 1917. A ilha de S. Tomé sob o ponto de vista histórico-natural e agrícola. Bol. Soc. Broteriana 27: 1–197.

INE (Instituto Nacional de Estatística). 2020. Resultados gerais sobre localidades, IV recenseamento geral da população e da habitação 2012. INE, São Tomé.

INEGE (Instituto Nacional de Estadística de Guinea Ecuatorial). 2017. Censo de población 2015 –República de Guinea Ecuatorial. INEGE, Malabo.

IUCN. 2020. The IUCN Red List of threatened species. Version 2020-2. www.iucnredlist.org (accessed 22 October 2020).

Jones, P. J. 1994. Biodiversity in the Gulf of Guinea: an overview. Biodiver. & Conserv. 3: 772–784.

Jones, P. J. & Tye, A. 2006. The birds of Príncipe, São Tomé and Annobón: an annotated checklist. BOU Checklist no. 22. British Ornithologists Union & British Ornithologists’ Club, Oxford.

Leventis, A. P. & Olmos, F. 2009. As aves de São Tomé e Príncipe: um guia fotográfico / The birds of São Tomé and Príncipe: a photo guide. Ed. Aves & Fotos, São Paulo.

de Lima, R. F. & Martins, M. 2020. International Waterbird Census São Tomé and Príncipe – 2020. Pp. 100–102 in van Roomen, M., Agblonon, G., Langendoen, T., Citegetse, G., Diallo, A. Y., Gueye, K., van Winden, E. & Luerssen, G. (eds.) Simultaneous January 2020 waterbird census along the East Atlantic Flyway: national reports. Wadden Sea Flyway Initiative p/a Common Wadden Sea Secretariat, Wilhelmshaven, Wetlands International, Wageningen & BirdLife International, Cambridge, UK.

Matilde, E. & de Lima, R. F. 2016. Photographic evidence for the occurrence of frigatebirds Fregata sp. in the Gulf of Guinea. Bull. Afr. Bird Cl. 23: 86–88.

Melo, M. 2007. Bird speciation in the Gulf of Guinea Island system. Ph.D. thesis. Institute of Evolutionary Biology, Univ. of Edinburgh.

Melo, M. & Fuchs, J. 2008. Phylogenetic relationships of the Gulf of Guinea Alcedo kingfishers. Ibis 150: 633–639.

Melo, M. & O’Ryan, C. 2007. Genetic differentiation between Príncipe Island and mainland populations of the grey parrot (Psitacus erithacus), and implications for conservation. Mol. Ecol. 16: 1673–1685.

Mills, M., Caddick, J., Hoff, R., Myers, D. & Coetzee, I. 2007. First record of Common Sand Martin Riparia riparia for São Tomé and Príncipe. Bull. Afr. Bird Cl. 14: 207.

Monteiro, M., Reino, L., Melo, M., Beja, P., Bastos-Silveira, C., Ramos, M., Rodrigues, D., Neves, I. Q., Consciência, S. & Figueira, R. 2016. The collection of birds from São Tomé and Príncipe at the Instituto de Investigação Científica Tropical of the University of Lisbon (Portugal). ZooKeys 600: 155–167.

Norder, S. J., de Lima, R. F., de Nascimento, L., Lim, J. Y., Fernández-Palacios, J. M., Romeiras, M. M., Elias, R. B., Cabezas, F. J., Catarino, L., Cereño, L. M. P., Castilla-Beltrán, A., Gabriel, R., de Sequeira, M. M., Rijndijk, K. F., Nogué, S., Kissling, W. D., van Loon, E. E., Hall, M., Matos, M. & Borges, P. A. V. 2020. Global change in microcosms: environmental and societal predictors of land cover change on the Atlantic Ocean Islands. Anthropocene 30: 100242.

Payne, R. B. 2020. African Emerald Cuckoo Chrysococcyx cupreus, version 1.0. In del Hoyo, J., Elliott, A. & Sargatal, J., Christie, D. A. & de Juana, E. (eds.) Birds of the world. Cornell Lab of Ornithology, Ithaca, NY. https://doi.org/10.2173/bow.afecuc1.01 (accessed 15 April 2021).

Pereira, H. 2013. Conservation genetics of the endemic pigeons of São Tomé and Príncipe. M.Sc. thesis. Faculdade de Ciências da Universidade do Porto.
Reino, L., Figueira, R., Beja, P., Araújo, M. B., Capinha, C. & Strubbe, D. 2017. Networks of global bird invasion altered by regional trade ban. *Sci. Advances* 3: e1700783.

Ryan, P. 2016. New scops owl on Príncipe. *African Birdlife* 5: 10.

Le Saout S., Hoffmann, M., Shi, Y., Hughes, A., Bernard, C., Brooks, T. M., Bertzky, B., Butchart, S. H. M., Stuart, S. N., Badman, T. & Rodrigues, A. S. L. 2013. Protected areas and effective biodiversity conservation. *Science* 342: 803–805.

Sloan, B. 2017. Bird records from Annobón, Equatorial Guinea, October 2016, including the first Squacco Heron *Ardeola ralloides*. *Bull. Afr. Bird Cl.* 24: 209–212.

Soares, F. C., Panisi, M., Sampaio, H., Soares, E., Santana, A., Buchanan G. M., Leal, A. I., Palmeirim, J. M. & de Lima, R. F. 2020. Land-use intensification promotes non-native species in a tropical island bird assemblage. *Anim. Conserv.* 23: 573–584.

Stattersfield, A. J., Crosby, M. J., Long, A. J. & Wege, D. C. 1998. *Endemic Bird Areas of the world: priorities for biodiversity conservation*. BirdLife International, Cambridge, UK.

Tavares, R. S. & Leitão, A. H. 2012. Lista comentada das espécies observadas na ilha de São Tomé. Unpubl. report.

UNEP-WCMC & IUCN. 2020. *Protected planet: the world database on protected areas (WDPA)/The global database on protected areas management effectiveness (GD-PAME)*. UNEP-WCMC & IUCN, Cambridge, UK. www.protectedplanet.net (accessed 22 October 2020).

UNESCO. 2020. *The Man and the Biosphere (MAB) programme*. MAB Biosphere Reserves Directory. www.unesco.org/mabdb/br/brdir/directory/database.asp (accessed 22 October 2020).

Uva, V., Päckert, M., Cibois, A., Fumagalli, L. & Roulin, A. 2018. Comprehensive molecular phylogeny of barn owls and relatives (Family: Tytonidae), and their six major Pleistocene radiations. *Mol. Phyl. & Evol.* 125: 127–137.

Valente, L., Phillimore, A. B., Melo, M., Warren, B. H., Clegg, S. M., Havenstein, K., Tiedemann, R., Illera, J. C., Thébaud, C., Aschenbach, T. & Etienne, R. S. 2020. A simple dynamic model explains the diversity of island birds worldwide. *Nature* 579: 92–96.

Valle, S. 2017. First confirmed record of Squacco Heron *Ardeola ralloides* for São Tomé and Príncipe. *Bull. Afr. Bird Cl.* 24: 90–91.

Valle, S. 2018. First documented records of Sanderling *Calidris alba* for São Tomé and Príncipe. *Bull. Afr. Bird Cl.* 25: 219–220.

Valle, S. & Patacho, M. 2014. First record of Spur-winged Lapwing *Vanellus spinosus* for São Tomé and Príncipe. *Bull. Afr. Bird Cl.* 21: 87–88.

Verbelen, P., Melo, M., Sangster, G. & Spina, F. 2016. A 90-year-old mystery solved: a potentially new species of owl from Príncipe. *Oryx* 50: 581.

WWF & IUCN. 1994–97. *Centres of plant diversity: a guide and strategy for their conservation*. WWF & IUCN, Gland.

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