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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

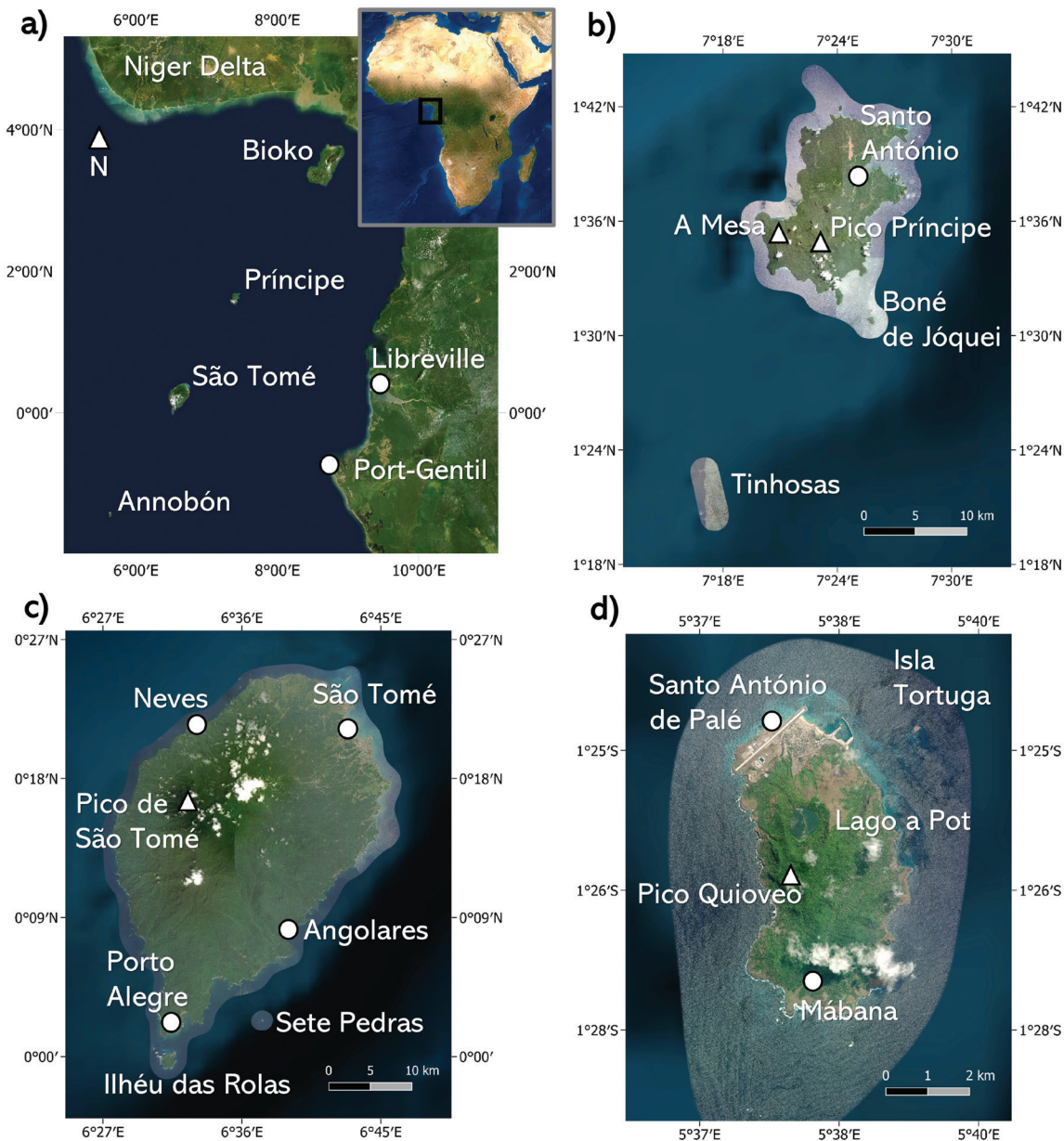


Figure 1. Map of (a) part of the Gulf of Guinea showing the oceanic islands and (b) Príncipe, (c) São Tomé and (d) Annobón. The inset in the top right of (a) shows the islands' location in relation to the African continent.

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 (Direcção 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 Seed eater *Crithagra rufobrunnea* endemic to Boné de Jóquei Islet; ** includes the subspecies of Príncipe Seed eater 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 erythrops*.

	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 <i>Sarkidiornis melanotos</i> (Pennant, 1769)		V ^S			
African Pygmy Goose <i>Nettapus auritus</i> (Boddaert, 1783)	v ^P	v ^P			Pv ^P : Correia <i>et al.</i> (2021). Sv ^P : Hansson & Thomasson (2014), ebird.org/checklist/S52109208.
FAMILY NUMIDIDAE					
Helmeted Guineafowl <i>Numida meleagris</i> (Linnaeus, 1758)	U	i	i		PU: no proof of presence. Ai: Sloan (2017).
FAMILY PHASIANTIDAE					
Harlequin Quail <i>Coturnix delegorguei histrionica</i> Hartlaub, 1849	u	S			Pu: N. Borrow & R. Demey in <i>Bull. Afr. Bird Cl.</i> 5: 74, N. Borrow in <i>Bull. Afr. Bird Cl.</i> 11: 77.
Red-necked Francolin <i>Pternistis afer afer</i> (Statius Müller, 1776)		i			Si: tentatively first recorded in the 1980s.
Red Junglefowl <i>Gallus gallus</i> (Linnaeus, 1758)			i		
FAMILY PHOENICOPTERIDAE					
Greater Flamingo <i>Phoenicopterus roseus</i> Pallas, 1811		U			
Lesser Flamingo <i>Phoeniconaias minor</i> (E. Geoffroy Saint-Hilaire, 1798)	V ^S				
FAMILY COLUMBIDAE					
Rock Dove <i>Columba livia livia</i> J. F. Gmelin, 1789	i	i			
Maroon Pigeon <i>Columba thomensis</i> Bocage, 1888		E			
São Tomé Pigeon <i>Columba malherbii</i> J. & E. Verreaux, 1851	E	E	E		
Lemon Dove <i>Columba larvata</i> Temminck, 1809					
<i>C. l. inornata</i> (Reichenow, 1892)			r		Endemic <i>C. l. hypoleuca</i> (Salvadori 1903) no longer considered valid.
<i>C. l. principalis</i> (Hartlaub, 1866)	S				
<i>C. l. simplex</i> (Hartlaub, 1849)		S			Sometimes treated as a species (e.g., Baptista <i>et al.</i> 1997).
Laughing Dove <i>Streptopelia senegalensis</i> (Linnaeus, 1766)	i	i			
São Tomé Green Pigeon <i>Treron sanctithomae</i> (J. F. Gmelin, 1789)		E			
African Green Pigeon <i>Treron calvus virescens</i> Amadon, 1953	S				
FAMILY CUCULIDAE					
Great Spotted Cuckoo <i>Clamator glandarius</i> (Linnaeus, 1758)	v ^S		V ^S		Pv ^S : Monteiro <i>et al.</i> (2016).

Taxa	P	S	A	O	Reference
Pied Cuckoo <i>Clamator jacobinus</i> (Boddaert, 1783)	u	V ^S			PU: M. Dallimer & M. Melo in <i>Bull. Afr. Bird Cl.</i> 15: 274.
Klaas's Cuckoo <i>Chrysococcyx klaas</i> (Stephens, 1815)		u			Su: no proof of presence.
African Emerald Cuckoo <i>Chrysococcyx cupreus insularum</i> 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 <i>Cuculus canorus</i> Linnaeus, 1758 / African Cuckoo <i>C. gularis</i> Stephens, 1815		U			
FAMILY CAPRIMULGIDAE					
Caprimulgus sp.			u		Au: Sloan (2017).
FAMILY APODIDAE					
São Tomé Spinetail <i>Zoonavena thomensis</i> (E. Hartert, 1900)	E	E			
Alpine Swift <i>Apus melba</i> (Linnaeus, 1758)			u		Au: no proof of presence.
Common Swift <i>Apus apus</i> (Linnaeus, 1758)	v ^P	U	v ^T		Pv ^P : ebird.org/checklist/S65190331. SU: N. Borrow in <i>Bull. Afr. Bird Cl.</i> 6: 78, ebird.org/checklist/S22513117, Tavares & Leitão (2012). Av ^T : Åkesson <i>et al.</i> (2012).
Pallid Swift <i>Apus pallidus</i> Shelley, 1870		U			SU: ebird.org/checklist/S14846119.
African Swift <i>Apus barbatus sladeniae</i> (Ogilvie-Grant, 1904)	U	U			PU: N. Borrow & R. Demey in <i>Bull. Afr. Bird Cl.</i> 5: 74, Boix (2010).
Little Swift <i>Apus affinis bannermani</i> E. Hartert, 1928	S	S			
Bates's Swift <i>Apus batesi</i> (Sharpe, 1904)	u				Pu: P. Verbelen took a photo in July 2016 that matched this species, but identification could not be confirmed.
African Palm Swift <i>Cypsiurus parvus brachypterus</i> (Reichenow, 1903)	i	i			
FAMILY RALLIDAE					
African Rail <i>Rallus caerulescens</i> J. F. Gmelin, 1789		V ^S			
African Crake <i>Crex egregia</i> (W. Peters, 1854)	V ^S	V ^S			SV ^S : Monteiro <i>et al.</i> (2016).
Lesser Moorhen <i>Paragallinula angulata</i> (Sundevall, 1851)	?	?			P?: Monteiro <i>et al.</i> (2016), ebird.org/checklist/S63554107. S?: safring.birdmap.africa/ring_info.php?ring=5A17962, ebird.org/checklist/S52109208. It is unclear if the species is resident or migrant, and if it breeds on either or both islands.
Common Moorhen <i>Gallinula chloropus meridionalis</i> (C. L. Brehm, 1831)	R	R	r		Ar: Sloan (2017). The species persists on Annobón.
Allen's Gallinule <i>Porphyrio alleni</i> Thomson, 1842	V ^{SP}	v ^{SP}	V ^S		PV ^P : ebird.org/checklist/S30800298. PV ^S & Sv ^S : Monteiro <i>et al.</i> (2016). Sv ^P : ebird.org/checklist/S51835860. The few records refer mostly to juveniles, but we assume that it does not breed on the islands.
FAMILY BURHINIDAE					
Eurasian Thick-knee <i>Burhinus oedicnemus</i> (Linnaeus, 1758)	v ^P				Pv ^P : ebird.org/checklist/S53730549.

Taxa	P	S	A	O	Reference
FAMILY CHARADRIIDAE					
Black-bellied Plover <i>Pluvialis squatarola</i> (Linnaeus, 1758)	v ^P	V ^S			Pv ^P : Correia <i>et al.</i> (2021). SV ^S : Monteiro <i>et al.</i> (2016).
European Golden Plover <i>Pluvialis apricaria</i> (Linnaeus, 1758)		U			
American Golden Plover <i>Pluvialis dominica</i> (Statius Müller, 1776)	v ^P	V ^S			Pv ^P : Correia <i>et al.</i> (2021). SV ^S : Monteiro <i>et al.</i> (2016).
Spur-winged Lapwing <i>Vanellus spinosus</i> (Linnaeus, 1758)	v ^P				Pv ^P : Valle & Patacho (2014).
Senegal Lapwing <i>Vanellus lugubris</i> (Lesson, 1826)	v ^P				Pv ^P : Correia <i>et al.</i> (2021).
Common Ringed Plover <i>Charadrius hiaticula</i> Linnaeus, 1758	v ^P	U			Pv ^P : Correia <i>et al.</i> (2021), ebird.org/checklist/S49597625, ebird.org/checklist/S83661197.
Little Ringed Plover <i>Charadrius dubius</i> Scopoli, 1786		U			
White-fronted Plover <i>Charadrius marginatus</i> Vieillot, 1818	v ^P	V ^S			Pv ^P : ebird.org/checklist/S83661197. SV ^S : Monteiro <i>et al.</i> (2016).
FAMILY SCOLOPACIDAE					
Whimbrel <i>Numenius phaeopus</i> (Linnaeus, 1758)	M	M	M		
Eurasian Curlew <i>Numenius arquata</i> (Linnaeus, 1758)	u	V ^S			
Bar-tailed Godwit <i>Limosa lapponica</i> (Linnaeus, 1758)	U	U	U		SU: ebird.org/checklist/S33613204.
Ruddy Turnstone <i>Arenaria interpres</i> (Linnaeus, 1758)	v ^P	V ^{SP}			Pv ^P : Hall <i>et al.</i> (2010). SV ^P : B. Piot in <i>Bull. Afr. Bird Cl.</i> 23: 241.
Red Knot <i>Calidris canutus</i> (Linnaeus, 1758)		v ^P			Sv ^P : ebird.org/checklist/S41339760.
Ruff <i>Calidris pugnax</i> (Linnaeus, 1758)		u			Su: ebird.org/checklist/S32889474, ebird.org/checklist/S33613204.
Curlew Sandpiper <i>Calidris ferruginea</i> (Pontoppidan, 1763)	V ^{SP}	u			Pv ^P : Correia <i>et al.</i> (2021). Su: C. Hjort in <i>Bull. Afr. Bird Cl.</i> 12: 187, ebird.org/checklist/S60715447.
Sanderling <i>Calidris alba</i> (Pallas, 1764)	v ^P	v ^P	v ^S		Pv ^P : H. Uhlig in <i>Bull. Afr. Bird Cl.</i> 10: 61, Valle (2018), Correia <i>et al.</i> (2021). Sv ^P : H. Uhlig in <i>Bull. Afr. Bird Cl.</i> 10: 61, ebird.org/checklist/S49555086.
Pectoral Sandpiper <i>Calidris melanotos</i> Vieillot, 1818	V ^S				PV ^S : Monteiro <i>et al.</i> (2016).
Little Stint <i>Calidris minuta</i> (Leisler, 1812)	U	U			
Great Snipe <i>Gallinago media</i> (Latham, 1787)	v ^P				Pv ^P : Correia <i>et al.</i> (2021).
Common Sandpiper <i>Actitis hypoleucos</i> (Linnaeus, 1758)	M	M			
Green Sandpiper <i>Tringa ochropus</i> Linnaeus, 1758		U			
Common Greenshank <i>Tringa nebularia</i> (Gunnerus, 1767)	M	M			
Wood Sandpiper <i>Tringa glareola</i> (Linnaeus, 1758)		v ^{SP}			Sv ^{SP} : reclassified as vagrant as not recorded in most years (ebird.org/species/woosan/ST-S).
FAMILY GLAREOLIDAE					
Black-winged Pratincole <i>Glareola nordmanni</i> J. G. Fischer, 1842	V ^S		V ^S		PV ^S : Monteiro <i>et al.</i> (2016).
Grey Pratincole <i>Glareola cinerea</i> Fraser, 1843	v ^P				Pv ^P : Correia <i>et al.</i> (2021).

Taxa	P	S	A	O	Reference
FAMILY STERCORARIIDAE					
Pomarine Jaeger <i>Stercorarius pomarinus</i> Temminck, 1815		u			Su: V. Schollaert & G. Willem in <i>Bull. Afr. Bird Cl.</i> 7: 76.
Parasitic Jaeger <i>Stercorarius parasiticus</i> (Linnaeus, 1758)		v ^P		U	Sv ^P : ebird.org/checklist/S14846065.
Long-tailed Jaeger <i>Stercorarius longicaudus</i> Vieillot, 1819				U	
FAMILY LARIDAE					
Sabine's Gull <i>Xema sabini</i> (Sabine, 1819)	U	U	U	U	Pu: ebird.org/checklist/S68133545.
Lesser Black-backed Gull <i>Larus fuscus</i> Linnaeus, 1758	U	U			Su: A. Gascoigne in <i>Bull. Afr. Bird Cl.</i> 11: 177.
Brown Noddy <i>Anous stolidus stolidus</i> (Linnaeus, 1758)	B	B	B		
Black Noddy <i>Anous minutus atlanticus</i> (Mathews, 1912)	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 <i>Onychoprion fuscatus fuscatus</i> (Linnaeus, 1766)	B	?	?		S? & A?: breeding possible but not confirmed.
Bridled Tern <i>Onychoprion anaethetus melanopterus</i> (Swainson, 1837)	?	?	B		P? & S?: breeding possible but not confirmed.
Black Tern <i>Chlidonias niger</i> (Linnaeus, 1758)		U		U	Su: ebird.org/checklist/S32779735.
White-winged Tern <i>Chlidonias leucopterus</i> (Temminck, 1815)			u		Au: single record in Fry (1961) but no supporting evidence.
Common Tern <i>Sterna hirundo</i> Linnaeus, 1758	U	U			Pu: ebird.org/checklist/S10327997. Su: C. Hjort in <i>Bull. Afr. Bird Cl.</i> 12: 187, ebird.org/checklist/S10328000.
Arctic Tern <i>Sterna paradisaea</i> Pontoppidan, 1763	U	U			Su: A. Gascoigne in <i>Bull. Afr. Bird Cl.</i> 11: 177.
Royal Tern <i>Thalasseus maximus</i> (Boddaert, 1783)		u		U	Su: ebird.org/checklist/S60715447.
Sandwich Tern <i>Thalasseus sandwicensis</i> (Latham, 1787)	u	v ^S			Pu: ebird.org/checklist/S68133545. Sv ^S : reclassified as vagrant since most years it is not recorded (ebird.org/species/santer1/ST-S).
FAMILY PHAETHONTIDAE					
White-tailed Tropicbird <i>Phaethon lepturus ascensionis</i> (Mathews, 1915)	B	B	B		
Red-billed Tropicbird <i>Phaethon aethereus</i> Linnaeus, 1758	?	v ^P			P?: S. J. Rumsey in <i>Bull. Afr. Bird Cl.</i> 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 ^P : L. Sineux in <i>Bull. Afr. Bird Cl.</i> 27: 114.
FAMILY OCEANITIDAE					
Wilson's Storm Petrel <i>Oceanites oceanicus</i> Kuhl, 1820				U	
Black-bellied Storm Petrel <i>Fregatta tropica</i> (Gould, 1844)	u	u		U	Pu: V. Schollaert & G. Willem in <i>Bull. Afr. Bird Cl.</i> 7: 76. Su: ebird.org/checklist/S57214304.
FAMILY HYDROBATIDAE					
European Storm Petrel <i>Hydrobates pelagicus</i> (Linnaeus, 1758)				U	Ou: N. Borrow in <i>Bull. Afr. Bird Cl.</i> 8: 65.

Taxa	P	S	A	O	Reference
Leach's Storm Petrel <i>Oceanodroma leucorhoa</i> (Vieillot, 1818)				U	
Band-rumped Storm Petrel <i>Oceanodroma castro</i> (Harcourt, 1851)		?	U	M	S?: V. Schollaert & G. Willem in <i>Bull. Afr. Bird Cl.</i> 7: 76, ebird.org/checklist/S57025283, ebird.org/checklist/S57214304. Om: N. Borrow in <i>Bull. Afr. Bird Cl.</i> 8: 65 and 9: 70. Breeding on São Tomé is likely but not confirmed (Flood <i>et al.</i> 2019). Possibly <i>O. jabejabe</i> or an undescribed form.
FAMILY PROCELLARIIDAE					
Bulwer's Petrel <i>Bulweria bulwerii</i> Jardine & Selby, 1828				U	
Cory's Shearwater <i>Calonectris diomedea</i> (Scopoli, 1769)	u			U	Pu: ebird.org/checklist/S20636314. The possibility of a Cape Verde Shearwater <i>C. edwardsii</i> could not be discarded.
Great Shearwater <i>Ardenna gravis</i> (O'Reilly, 1818)				U	
Sooty Shearwater <i>Ardenna grisea</i> (J. F. Gmelin, 1789)				V ^S	Pu: ebird.org/checklist/S10327997.
Little Shearwater <i>Puffinus assimilis</i> Gould, 1838				U	
FAMILY CICONIIDAE					
White Stork <i>Ciconia ciconia</i> (Linnaeus, 1758)		V ^{SP}			SV ^P : A. Gascoigne in <i>Bull. Afr. Bird Cl.</i> 15: 135.
Yellow-billed Stork <i>Mycteria ibis</i> (Linnaeus, 1766)		u			
FAMILY FREGATIDAE					
Ascension Frigatebird <i>Fregata aquila</i> (Linnaeus, 1758)	U			U	
Magnificent Frigatebird <i>Fregata magnificens</i> Mathews, 1914		v ^P			Pv ^P : Matilde & de Lima (2016), Correia <i>et al.</i> (2021).
FAMILY SULIDAE					
Masked Booby <i>Sula dactylatra</i> Lesson, 1831	v ^{SP}		U	u	Pv ^S : Monteiro <i>et al.</i> (2016), Pv ^P : ebird.org/checklist/S6591443.
Brown Booby <i>Sula leucogaster leucogaster</i> (Boddaert, 1783)	B	B	?		A?: breeding possible but not confirmed.
Red-footed Booby <i>Sula sula</i> (Linnaeus, 1766)	u	v ^P			Pu: ebird.org/checklist/S39180120. Sv ^P : ebird.org/checklist/S80241954
Cape Gannet <i>Morus capensis</i> (M. H. C. Lichtenstein, 1823)	U	U			
FAMILY PHALACROCORACIDAE					
Long-tailed Cormorant <i>Microcarbo africanus africanus</i> (J. F. Gmelin, 1789)	v ^P	R			Pv ^P : ebird.org/checklist/S63580421.
Great Cormorant <i>Phalacrocorax carbo</i> (Linnaeus, 1758)	U	U			
FAMILY ARDEIDAE					
Little Bittern <i>Ixobrychus minutus</i> (Linnaeus, 1766)	?				P?: breeding confirmed on Príncipe but no subsequent records.
Grey Heron <i>Ardea cinerea</i> Linnaeus, 1758	u	V ^{SP}			Pu: V. Schollaert & G. Willem in <i>Bull. Afr. Bird Cl.</i> 7: 76, N. Borrow in <i>Bull. Afr. Bird Cl.</i> 10: 137. SV ^S : Monteiro <i>et al.</i> (2016). SV ^P : ebird.org/checklist/S63841541.
Black-headed Heron <i>Ardea melanocephala</i> (Children & Vigors, 1826)	v ^P	v ^P			Pv ^P : Cheke & Pereira (2020). Sv ^P : B. Piot in <i>Bull. Afr. Bird Cl.</i> 23: 241.

Taxa	P	S	A	O	Reference
Purple Heron <i>Ardea purpurea</i> (Linnaeus, 1766)		V ^S			SV ^S : Monteiro <i>et al.</i> (2016).
Great Egret <i>Ardea alba</i> Linnaeus, 1758		U			SU: ebird.org/checklist/S51768645.
Intermediate Egret <i>Ardea intermedia</i> A. E. Brehm, 1854	u	v ^P			Pu: M. Melo in <i>Bull. Afr. Bird Cl.</i> 11: 77, Sv ^P : Hall <i>et al.</i> (2010).
Little Egret <i>Egretta garzetta</i> (Linnaeus, 1766)	v ^P	U			Pv ^P : Hall <i>et al.</i> (2010). SU: ebird.org/species/litegr/ST-S.
Western Reef Heron <i>Egretta gularis gularis</i> (Bosc, 1792)	R	R	R		AR: Sloan (2017).
Black Heron <i>Egretta ardesiaca</i> (Wagler, 1827)	u	V ^P			Pu: Y. Santos described a black heron using its wings to form a canopy for feeding.
Cattle Egret <i>Bubulcus ibis ibis</i> (Linnaeus, 1758)	r	r	u		Pr & Sr: present year-round (ebird.org/species/categr/ST-P, ebird.org/species/categr/ST-S). Au: no proof of presence.
Squacco Heron <i>Ardeola ralloides</i> (Scopoli, 1769)	v ^P	v ^P	v ^P		Pv ^P : Valle (2017), Correia <i>et al.</i> (2021), ebird.org/checklist/S63580421. Sv ^P : ebird.org/checklist/S26063168, ebird.org/checklist/S80242124. Av ^P : Sloan (2017).
Striated Heron <i>Butorides striata atricapilla</i> (Afzelius, 1804)	R	R	V ^S		
Black-crowned Night Heron <i>Nycticorax nycticorax</i> (Linnaeus, 1758)		U			
FAMILY THRESKIORNITHIDAE					
Olive Ibis <i>Bostrychia olivacea rothschildi</i> (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 <i>Bostrychia bocagei</i> (Chapin, 1923)		E			
FAMILY PANDIONIDAE					
Osprey <i>Pandion haliaetus</i> (Linnaeus, 1758)	v ^P				Pv ^P : ebird.org/checklist/S63580421.
FAMILY ACCIPITRIDAE					
Bat Hawk <i>Macheiramphus alcinus</i> Bonaparte, 1850		u			Su: H. Uhlig in <i>Bull. Afr. Bird Cl.</i> 10: 61.
Black Kite <i>Milvus migrans parasitus</i> (Daudin, 1800)	R	R	V ^S		
FAMILY TYTONIDAE					
Barn Owl <i>Tyto alba thomensis</i> (Hartlaub, 1852)		S			SS: might be best treated as an endemic species (Uva <i>et al.</i> 2018, Alves 2019).
FAMILY STRIGIDAE					
São Tomé Scops Owl <i>Otus hartlaubi</i> (Giebel, 1849)		E			
African Scops Owl <i>Otus senegalensis feae</i> (Salvadori, 1903)			S		AS: Sloan (2017). Ongoing debate on taxonomic status (e.g., Freitas 2019 and Billerman <i>et al.</i> 2020 vs. Collar & Boesman 2020 and Gill <i>et al.</i> 2021).
<i>Otus</i> sp. nov.	e				Pe: Freitas 2019.
FAMILY UPUPIDAE					
Eurasian Hoopoe <i>Upupa epops</i> Linnaeus, 1758		v ^P			Sv ^P : A. Gascoigne in <i>Bull. Afr. Bird Cl.</i> 11: 77.

Taxa	P	S	A	O	Reference
FAMILY ALCEDINIDAE					
Malachite Kingfisher <i>Corythornis cristatus</i> (Pallas, 1764)					Both subspecies sometimes treated as separate endemic species.
<i>C. c. thomensis</i> (Salvadori, 1902)		S			
<i>C. c. nais</i> (Kaup, 1848)	S				PS: Melo & Fuchs (2008). Previously <i>C. leucogaster nais</i> .
Blue-breasted Kingfisher <i>Halcyon malimbica dryas</i> Hartlaub, 1854	S				
Kingfisher <i>Halcyon</i> sp.		u			Su: Hansson & Thomasson (2014).
Pied Kingfisher <i>Ceryle rudis</i> (Linnaeus, 1758)	?	U			P?: R. Rocha in <i>Bull. Afr. Bird Cl.</i> 16: 107, A. Castelo <i>et al.</i> in <i>Bull. Afr. Bird Cl.</i> 21: 105–106, Correia <i>et al.</i> (2021), ebird.org/species/piekin1/ST-P. It is unclear if the species is resident or migrant, or if it breeds occasionally on Príncipe. SU: ebird.org/species/piekin1/ST-S.
FAMILY MEROPIDAE					
<i>Merops</i> sp.			U		
FAMILY CORACIIDAE					
European Roller <i>Coracias garrulus</i> Linnaeus, 1758	V ^S	V ^S			
Broad-billed Roller <i>Eurystomus glaucurus</i> (Statius Müller, 1776)	v ^P				Pv ^P : ebird.org/checklist/S46018843.
FAMILY FALCONIDAE					
Common Kestrel <i>Falco tinnunculus</i> Linnaeus, 1758	U				
Red-footed Falcon <i>Falco vespertinus</i> Linnaeus, 1766	v ^P	V ^{SP}			Pv ^P : ebird.org/checklist/S61016398. SV ^S : Monteiro <i>et al.</i> (2016). SV ^P : A. Gascoigne in <i>Bull. Afr. Bird Cl.</i> 11: 77.
Lanner Falcon <i>Falco biarmicus</i> Temminck, 1825		u			Su: ebird.org/checklist/S63841918, ebird.org/checklist/S63940605.
Peregrine Falcon <i>Falco peregrinus</i> Tunstall, 1771		U			
FAMILY PSITTACULIDAE					
Red-headed Lovebird <i>Agapornis pullarius pullarius</i> (Linnaeus, 1758)	X	i			
FAMILY PSITTACIDAE					
Grey Parrot <i>Psittacus erithacus</i> Linnaeus, 1758	R	i			Si: ebird.org/species/grepar/ST-S. Continuous presence, especially in the north-east, where possibly established from released caged birds. Unclear which taxon occurs on the islands (Melo & O’Ryan 2007).
FAMILY ORIOLIDAE					
Eurasian Golden Oriole <i>Oriolus oriolus</i> (Linnaeus, 1758)	V ^S	v ^P			PV ^S : Monteiro <i>et al.</i> (2016). Sv ^P : van Boekel (2016).
São Tomé Oriole <i>Oriolus crassirostris</i> Hartlaub, 1857		E			
FAMILY DICRURIDAE					
Velvet-mantled Drongo <i>Dicrurus modestus modestus</i> Hartlaub, 1849	s				Ps: formerly recognised as a species endemic to Príncipe.

Taxa	P	S	A	O	Reference
FAMILY MONARCHIDAE					
São Tomé Paradise Flycatcher <i>Terpsiphone atrochalybeia</i> (Thomson, 1842)		E			
Black-headed Paradise Flycatcher <i>Terpsiphone rufiventris smithii</i> (Fraser, 1843)			s		Previously treated as an endemic species, <i>T. smithii</i> .
Family LANIIDAE					
Red-backed Shrike <i>Lanius collurio</i> Linnaeus, 1758		u	V ^R		
Lesser Grey Shrike <i>Lanius minor</i> J. F. Gmelin, 1788	V ^S		u		PV ^S : Monteiro <i>et al.</i> (2016).
Newton's Fiscal <i>Lanius newtoni</i> Bocage, 1891		E			
FAMILY CISTICOLIDAE					
Chattering Cisticola <i>Cisticola anonymus</i> (J. W. von Müller, 1855)		-			
São Tomé Prinia <i>Prinia mollerii</i> Bocage, 1887		E			
FAMILY ACROCEPHALIDAE					
Western Olivaceous Warbler <i>Iduna cf. opaca</i> (Cabanis, 1850)	v ^P				Pv ^P : Correia <i>et al.</i> (2021).
Sedge Warbler <i>Acrocephalus schoenobaenus</i> (Linnaeus, 1758)		v ^R			Sv ^R : S. Andersson in <i>Bull. Afr. Bird Cl.</i> 11: 77, safring.birdmap.africa/ring_info.php?ring=GA70214, safring.birdmap.africa/ring_info.php?ring=GA70215.
Great Reed Warbler <i>A. arundinaceus</i> (Linnaeus, 1758)		v ^A			Sv ^A : B. Piot in <i>Bull. Afr. Bird Cl.</i> 23: 241.
FAMILY HIRUNDINIDAE					
Banded Martin <i>Riparia cincta</i> (Boddaert, 1783)	V ^S				
Sand Martin <i>Riparia riparia</i> (Linnaeus, 1758)		u			Pu: Mills <i>et al.</i> (2007).
Barn Swallow <i>Hirundo rustica</i> (Linnaeus, 1758)	V ^{SR}	v ^{SP}			PV ^S : Monteiro <i>et al.</i> (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 <i>Cecropis abyssinica</i> (Guérin-Ménéville, 1843)		u			Pu: H. Uhlig in <i>Bull. Afr. Bird Cl.</i> 10: 61.
Common House Martin <i>Delichon urbicum</i> (Linnaeus, 1758)	V ^S	v ^P			Sv ^P : ebird.org/checklist/S49555067.
Grey-rumped Swallow <i>Pseudhirundo griseopyga</i> (Sundevall, 1850)	U	u			Su: P. Christy in <i>Bull. Afr. Bird Cl.</i> 18: 102, ebird.org/checklist/S24605216.
FAMILY PHYLLOSCOPIDAE					
Willow Warbler <i>Phylloscopus trochilus</i> (Linnaeus, 1758)	v ^P	u		U	Pv ^P : ebird.org/checklist/S32876010. Su: ebird.org/checklist/S18824617, ebird.org/checklist/S63701919.
FAMILY SYLVIIDAE					
Dohrn's Thrush-Babbler <i>Sylvia dohrni</i> (Hartlaub, 1866)		E			Formerly included in the endemic monospecific genus <i>Horizorhinus</i> .
Garden Warbler <i>Sylvia borin</i> (Boddaert, 1783)	v ^P	u	V ^S		Pv ^P : ebird.org/checklist/S42176347. Su: C. Hjort in <i>Bull. Afr. Bird Cl.</i> 12: 187, ebird.org/checklist/S16448286, ebird.org/checklist/S54165131.

Taxa	P	S	A	O	Reference
Common Whitethroat <i>Sylvia communis</i> Latham, 1787	v ^R				Pv ^R : safring.birdmap.africa/ring_info.php?ring=GA59510, safring.birdmap.africa/ring_info.php?ring=GA59517.
FAMILY ZOSTEROPIDAE					
Príncipe White-eye <i>Zosterops ficedulinus</i> Hartlaub, 1866	E				Previously treated as an endemic subspecies of <i>Z. ficedulinus</i> .
Annoñón White-eye <i>Zosterops griseovirescens</i> Bocage, 1893			E		
São Tomé White-eye <i>Zosterops feae</i> Salvadori, 1901		E			Previously treated as an endemic subspecies of <i>Z. ficedulinus</i> .
Black-capped Speirops <i>Zosterops lugubris</i> (Hartlaub, 1848)		E			Formerly included in the genus <i>Speirops</i> , endemic to the Cameroon line of volcanoes, which is no longer considered valid.
Príncipe Speirops <i>Zosterops leucophaeus</i> (Hartlaub, 1857)	E				Formerly included in the genus <i>Speirops</i> , endemic to the Cameroon line of volcanoes, which is no longer considered valid.
FAMILY STURNIDAE					
Chestnut-winged Starling <i>Onychognathus fulgidus fulgidus</i> (Hartlaub, 1849)		S			
Splendid Starling <i>Lamprolornis splendidus</i> (Vieillot, 1822)	r				Pr: ebird.org/species/spgsta1/ST. Frequent throughout the year.
Príncipe Starling <i>Lamprolornis ornatus</i> (Daudin, 1800)	E				
FAMILY TURDIDAE					
Príncipe Thrush <i>Turdus xanthorhynchus</i> Salvadori, 1901	e				Previously treated as an endemic subspecies of <i>T. olivaceofuscus</i> .
São Tomé Thrush <i>Turdus olivaceofuscus</i> Hartlaub, 1852		E			
FAMILY MUSCICAPIDAE					
Spotted Flycatcher <i>Muscicapa striata</i> (Pallas, 1764)	V ^{SP}	u	V ^S	u	PV ^S : Monteiro <i>et al.</i> (2016). PV ^P : Correia <i>et al.</i> (2021). SU: ebird.org/checklist/S14846119, ebird.org/checklist/S35796350.
Common Nightingale <i>Luscinia megarhynchos</i> (C. L. Brehm, 1831)		v ^A			Sv ^A : ebird.org/checklist/S54165131.
Whinchat <i>Saxicola rubetra</i> (Linnaeus, 1758)	V ^S	u			PV ^S : Hall <i>et al.</i> (2010), Correia <i>et al.</i> (2021). Su: ebird.org/checklist/S18824617.
Northern Wheatear <i>Oenanthe oenanthe</i> (Linnaeus, 1758)	v ^P				Pv ^P : Correia <i>et al.</i> (2021).
Isabelline Wheatear <i>Oenanthe isabellina</i> (Temminck, 1829)		u			Su: C. Hjort in <i>Bull. Afr. Bird Cl.</i> 12: 187.
FAMILY NECTARINIIDAE					
Príncipe Sunbird <i>Anabathmis hartlaubii</i> (Hartlaub, 1857)	E				
Newton's Sunbird <i>Anabathmis newtonii</i> (Bocage, 1887)		E			
São Tomé Sunbird <i>Dreptes thomensis</i> (Bocage, 1889)		E			
Olive Sunbird <i>Cyanomitra olivacea cephalis</i> (Bates, 1930)	R				

Taxa	P	S	A	O	Reference
FAMILY PLOCEIDAE					
Príncipe Golden Weaver <i>Ploceus princeps</i> (Bonaparte, 1851)	E				
Southern Masked Weaver <i>Ploceus velatus</i> Vieillot, 1819		i			Endemic <i>P. v. peixotoi</i> (Frade & Naurois, 1964) no longer considered valid.
Vitelline Masked Weaver <i>Ploceus vitellinus</i> (M. H. C. Lichtenstein, 1823)		-			In the past considered conspecific with <i>P. velatus</i> and, as such, was sometimes listed for São Tomé under this name.
Village Weaver <i>Ploceus cucullatus</i> (Statius Müller, 1766)		i			
Giant Weaver <i>Ploceus grandis</i> (G. R. Gray, 1844)		E			
São Tomé Weaver <i>Ploceus sanctithomae</i> (Hartlaub, 1848)		E			
Red-headed Quelea <i>Quelea erythrops</i> (Hartlaub, 1848)	X	?			S?: Monteiro <i>et al.</i> (2016), ebird.org/species/rehque1/ST. No records March–June, so it might be either resident or a breeding migrant.
Red-billed Quelea <i>Quelea quelea</i> (Linnaeus, 1758)		U			
Black-winged Bishop <i>Euplectes hordeaceus</i> (Linnaeus, 1758)		i			
Golden-backed Bishop <i>Euplectes aureus</i> (J. F. Gmelin, 1789)		i			Endemic to Angola with a resident population on São Tomé.
White-winged Widowbird <i>Euplectes albonotatus asymmetrurus</i> (Reichenow, 1892)		i			
FAMILY ESTRILDIDAE					
Chestnut-breasted Nigrita <i>Nigrita bicolor brunnescens</i> Reichenow, 1902	R				
Cinderella Waxbill <i>Estrilda thomensis</i> (de Sousa, 1888)		?			S?: single record from 1887 considered vagrant or escapee.
Common Waxbill <i>Estrilda astrild jagoensis</i> Alexander, 1898		i	i		Pi & Si: Billerman <i>et al.</i> (2020).
Southern Cordon-bleu <i>Uraeginthus angolensis angolensis</i> (Linnaeus, 1758)			i		
Red-billed Firefinch <i>Lagonosticta senegala</i> (Linnaeus, 1766)		?			P?: Monteiro <i>et al.</i> (2016). Single record from 1970, which might refer to a vagrant or escapee.
Bronze Mannikin <i>Spermestes cucullata cucullata</i> (Swainson, 1837)		i	i	i	Pi & Si: Leventis & Olmos (2009).
FAMILY VIDUIDAE					
Pin-tailed Whydah <i>Vidua macroura</i> (Pallas, 1764)	U	i			PU: ebird.org/checklist/S45937385. Si: Leventis & Olmos (2009).
Eastern Paradise Whydah <i>Vidua paradisaea</i> (Linnaeus, 1758)		?			S?: two records, the most recent from 1909, either vagrant, introduced or escaped birds.
FAMILY MOTACILLIDAE					
São Tomé Short-tail <i>Motacilla bocagii</i> (Sharpe, 1892)			E		Formerly included in the endemic monospecific genus <i>Amaurocichla</i> .
Western Yellow Wagtail <i>M. flava</i> Linnaeus, 1758	v ^P	u			Pv ^P : Hall <i>et al.</i> (2010). Su: ebird.org/checklist/S18824617. <i>M. f. thunbergi</i> is unconfirmed on Príncipe (ebird.org/checklist/S17866672).
White Wagtail <i>M. alba</i> Linnaeus, 1758		v ^P			Pv ^P : ebird.org/checklist/S75550610.
<i>Motacilla</i> sp.		U			Probably <i>M. alba</i> .

Taxa	P	S	A	O	Reference
Plain-backed Pipit <i>Anthus leucophrys</i> Vieillot, 1818	u				Pu: Hall <i>et al.</i> (2010).
Tree Pipit <i>Anthus trivialis</i> (Linnaeus, 1758)		U			
FAMILY FRINGILLIDAE					
Yellow-fronted Canary <i>Crithagra mozambica</i> (Statius Müller, 1776)		i	?		A?: single record, probably of a vagrant or escapee.
Príncipe Seedeater <i>Crithagra rufobrunnea</i> (G. R. Gray, 1862)	E	E			
<i>C. r. rufobrunnea</i> (G. R. Gray, 1862)	S				Subspecies endemic to Príncipe.
<i>C. r. thomensis</i> (Bocage, 1888)		S			Subspecies endemic to São Tomé.
<i>C. r. fradei</i> (Naurois, 1975)	S				Subspecies endemic to Boné de Jóquei Islet (off Príncipe).
São Tomé Grosbeak <i>Crithagra concolor</i> (Bocage, 1888)		E			Formerly included in the endemic monospecific genus <i>Neospiza</i> .

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 Príncipe Seedeater *Crithagra rufobrunnea*). Recent changes in the list of resident species include the recognition of the extinction of the Príncipe subspecies of Olive Ibis *Bostrychia olivacea rothschildi*, the discovery of a scops owl *Otus* sp. nov. on Príncipe, the recognition of Splendid Starling *Lamprolornis splendidus* as a resident species, the elevation to species level of Príncipe Thrush *Turdus xanthorhynchus* and São Tomé White-eye *Zosterops feae*, the downgrading to subspecies of Príncipe 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 Príncipe to Malachite Kingfisher as *C. cristatus nais* (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 sandwicensis* 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 Príncipe 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 Príncipe Thrush and Príncipe White-eye *Zosterops ficedulinus*, and the as yet undescribed *Otus* on Príncipe. On the other hand, Príncipe 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*, Príncipe Thrush and São Tomé Grosbeak *Crithagra concolor*), four Endangered (Maroon Pigeon *Columba thomensis*, São Tomé Green Pigeon, Grey Parrot and Príncipe 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 Príncipe 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 Príncipe.

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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