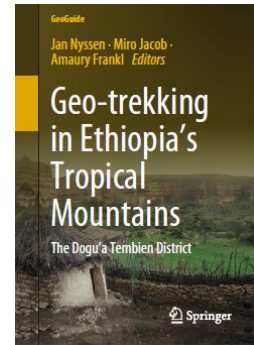


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10 Aerts R., Lerouge F., November E. 2019. Birds of forests and open woodlands in the highlands of Dogu'a
11 Tembien. Pp. 261-278 in Nyssen J., Jacobs M., Frankl A. (Eds.) Geo-trekking in Ethiopia's Tropical
12 Mountains. The Dogu'a Tembien District. GeoGuide. Springer nature Switzerland AG.
13 https://doi.org/10.1007/978-3-030-04955-3_17

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29



30

31 **Birds of forests and open woodlands in the highlands of Dogu’a Tembien**

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35

36 The landscape in Dogu’a Tembien, in the northern highlands of Ethiopia, is a mosaic of
37 cropland, woodland and evergreen scrub with isolated patches of dry forest. Ethiopia is endowed
38 with an exceptionally rich fauna and flora, and is a global hotspot of biodiversity and endemism.
39 In Ethiopia and Eritrea, 872 bird species occur, representing 39% of the bird species of Africa
40 and including 32 endemic species. Likewise, the forest-woodland-grassland complex in Dogu’a
41 Tembien is the habitat of a rich and interesting yet relatively underexplored bird fauna with
42 several endemic and biome-restricted species. In this chapter, we will look at birds in forest
43 fragments and open woodland of varying ecological quality, in particular church forests, grazing
44 enclosures and grazed woodland. We demonstrate that birds contribute substantially to the
45 cultural ecosystem services of the landscape by providing a high ecotourism potential.

46

47 **20.1 Birding Habitats in Dogu’a Tembien**

48 According to the most recent classification of vegetation in Ethiopia by Friis et al., the potential
49 natural vegetation of the Ethiopian highlands between 1800 and 3000 m altitude is “dry
50 evergreen montane forest and grassland complex” in areas with rainfall below 1700 mm per
51 year. This dry evergreen montane forest can be subdivided in a number of subtypes based on

52 differences in the dominance of the indigenous coniferous species *Afrocarpus falcatus* and
53 *Juniperus procera* and in the relative abundances of grass, shrubs or broadleaved trees present in
54 the forest, and it can structurally vary from grasslands with shrubs and trees to closed-canopy
55 forest. Remnants of natural forests occur in isolated patches and are associated with wooded
56 grasslands, *Acacia* woodland and evergreen scrub. The forests are primarily “dry single-
57 dominant Afromontane forest of the Ethiopian highlands” with *Juniperus procera* and African
58 wild olive (*Olea europaea* ssp. *cuspidata*) as the most characteristic species (see Chapter 16 for
59 an overview of Afromontane forest types). *Juniperus* has become very rare throughout the
60 landscape but the wild olive can still be found in forests, in villages and sometimes as remnant
61 tree in the landscape. Wild olive is often the dominant component of “church forests” (Chapter
62 16). Church forests are small patches of forest, on average ~2.5 ha in size, that surround
63 Ethiopian Orthodox churches and that are protected because of the spiritual, cultural and
64 aesthetic values the local communities attach to these forests (Photo 20.1 and photos in Chapter
65 16). These forests offer unique resources to birds, such as food, shelter, shade, nesting sites and
66 water, and are the prime birdwatching habitat of the area. Prior permission to visit these church
67 forests and other sacred sites should be sought from the local priests; a support letter in Tigrinya
68 from a local official office may be extremely helpful. Other habitats worth investigating include
69 open woodlands associated to river gorges, *hezaeti* spare grazing lands and in particular
70 enclosures, formerly degraded land where open woodland of small shrub and tree species has
71 regenerated following the exclusion of livestock grazing and wood cutting (see Chapter 18).
72 Also a number of small-scale landscape elements, embedded in agricultural land or in those open
73 woodlands, are usually interesting in terms of avifauna; such landscape elements include
74 *Euphorbia* hedgerows, stone mounds (for raptors, see Chapter 21), microdams and in particular

75 isolated fig trees, especially when bearing fruits. The area lies within the internationally
76 recognized Endemic Bird Area ‘Central Highlands’ of Ethiopia (EBA 115).

77

78 **20.2 Bird Survey**

79 To provide evidence for the bird conservation value of isolated forests and grazing exclosures,
80 we surveyed bird species in a landscape mosaic of approximately $5 \times 10 \text{ km}^2$ that consisted of
81 evergreen scrub and woodland, cropland and 10 dry Afromontane forest fragments in the Geba
82 river catchment ($13^\circ 37' \text{ N}$, $39^\circ 21' \text{ E}$; half-degree square or ‘tetrad’ 23c in the Birds of Ethiopia
83 and Eritrea atlas) in Central Tigray, northern Ethiopia, 20 km NW of the regional capital Mekelle
84 and at an elevation of 1800–2000 m. The study was designed to determine bird species
85 community compositions of forest fragments, grazing exclosures and grazed open woodland and
86 to assess whether there are forest-dependent birds that use exclosures and grazed woodland as
87 additional habitat. The small forest fragments (0.4–21 ha in size) consisted of dry Afromontane
88 forest with some fragments near water dominated by winter thorn (*Faidherbia albida*) and white
89 stinkwood (*Celtis africana*), and other, drier, fragments by olive, *Acacia* and the bushwillow
90 *Combretum collinum* (Photo 20.1). The exclosures and grazing lands consisted of *Acacia*
91 woodland with evergreen scrub species such as *Euclea racemosa* and *Aloe macrocarpa*. The
92 study was carried out during the cold rainy season (from 26 July to 15 October 2004), when
93 Palearctic migrant species were present. We conducted 277 one-hour timed species counts in ten
94 forest fragments (188 counts), five exclosures (57 counts) and three grazing lands (32 counts).

95

96

97 **20.3 Sequence and Nomenclature**

98 Checklists, field guides and distribution atlases of bird species traditionally make use of
99 taxonomic or systematic lists of bird species, in which bird species are placed in a sequence that
100 reflects the evolutionary history of birds. The nomenclature and the species list at the end of this
101 chapter follow the nomenclature and sequence adopted by “Birds of Ethiopia and Eritrea. An
102 atlas of distribution”. The sequence and nomenclature in this authoritative atlas for Ethiopia is an
103 adaptation of the sequence and nomenclature of the Howard and Moore Complete Checklist of
104 the Birds of the World, which is relatively stable in terms of nomenclature for Ethiopia. Because
105 of the many uncertainties of which taxa are currently recognized as distinct species and because
106 of the ongoing process of splitting species, which may result in additional endemics or near-
107 endemics in the future, some names used in this chapter may differ from names used in other
108 publications. The number preceding each species in the species list in the Appendix is the
109 sequence number of the bird species in the first edition of “Birds of Ethiopia and Eritrea. An
110 atlas of distribution”.

111

112 **20.4 Bird Communities**

113 A total of 170 bird species were recorded at 18 sites (at least 551 bird species occur in Tigray but
114 these numbers include lowland bird species and species of habitats that were not surveyed in this
115 study such as marshes and ponds). Forest sites (133 species) and non-forest sites (i.e. exclosures
116 and grazed woodland) (94 species) shared 81 species (55%). This means that 52 species (31%)
117 of the recorded bird species were only observed in the small forest fragments in the study area.
118 We found three distinct forest bird communities: birds of dry Afromontane forest in the vicinity

119 of water (6 sites, 119 species), birds of other (more open) dry Afromontane forest (4 sites, 121
120 species), and birds of *Acacia* woodland and evergreen scrubland (all exclosures and grazed
121 woodland sites, 8 sites, 84 species). Overall, the recorded bird community was representative of
122 Afrotropical highland open forest and woodland with a high proportion of competitive generalist
123 species (31%). The most common species across all sites included Speckled Pigeon, Dusky
124 Turtle Dove, Laughing Dove, Grey-backed Camaroptera, Common Bulbul, Blue-eared Glossy
125 Starling, Variable Sunbird, Grey-headed (Swainson's) Sparrow, Baglafaecht Weaver and Red-
126 cheeked Cordon-bleu (often spotted within the first ten minutes of a visit to a site).

127

128 **20.5 Biome-Restricted, Endemic and Specialty Bird Species**

129 Twenty-four species (14%) were biome-restricted. Eighteen species belonged to the Afrotropical
130 Highland Biome (AHB), an assemblage that contains 56 bird species in Ethiopia. These species
131 typically occur in the dry evergreen montane forests of the highland plateau but can also occupy
132 other habitats. All AHB species are species of interest for the area. Wattled Ibis (ENDEMIC, an
133 endemic of Ethiopia and Eritrea) can be found feeding in wet grassland and open woodland (and
134 also occurs in cities). Black-winged Lovebird (ENDEMIC), Banded Barbet (ENDEMIC), Gold-
135 mantled (Abyssinian) Woodpecker (ENDEMIC), Montane White-eye (endemic to high mountains
136 of Northeast Africa), Rüppell's Robin-Chat, Abyssinian Slaty Flycatcher (ENDEMIC) and
137 Tacazze Sunbird are found in evergreen forest, mountain woodlands and areas with scattered
138 trees including fig trees, euphorbias and junipers. Erckel's Francolin (Abyssinian near endemic),
139 Dusky Turtle Dove, Grey-headed (Swainson's) Sparrow (Abyssinian near-endemic), Baglafaecht
140 Weaver, African Citril, Brown-rumped Seedeater (Abyssinian near-endemic) and Streaky

141 Seedeater are common Afrotropical breeding residents of woodland edges, scrubland and forest
142 edges. White-billed Starling (ENDEMIC) and Little Rock Thrush (an endemic of Arabia and
143 Northeast Africa) can be found on steep cliffs and White-collared Pigeon (ENDEMIC) in gorges
144 and rocky places but also in towns and villages.

145 A number of enigmatic species of the AHB were not recorded during the formal survey but
146 were recorded in other forests in the area, most notably White-cheeked Turaco (a near endemic
147 of Ethiopia and Eritrea) and Abyssinian (Black-headed Forest) Oriole (ENDEMIC) (both recorded
148 in *Abiy Dur* ('Large Forest') in Waseya (Photo 16.10), see recommended birdwatching sites).
149 Yellow-fronted Parrot (ENDEMIC) and Abyssinian Catbird (ENDEMIC) were not recorded but
150 could be present in dense bushy areas and *Acacia-Juniper* forest. Both bird species have been
151 confirmed in adjacent half-degree squares (Yellow-fronted Parrot: tetrads 23a, 23d; Abyssinian
152 Catbird tetrads 23b, 31b), some of which overlap with the National Forest Priority Areas and
153 Important Bird Areas Desa'a Forest (IBA2) and Hugumburda and Grat-Kahsu Forests (IBA5).

154 Five species belonged to the Somali-Masai Biome (SMB). Hemprich's Hornbill (Photo
155 20.2) and White-rumped Babbler (Abyssinian near-endemic) are found in bushland, scrubland
156 and dense secondary forest, often near cliffs, gorges or water. Somali (Chestnut-Winged)
157 Starling and Rüppel's Weaver are found in bushy and shrubby areas. The Somali Starling may
158 be confused with the much more common Slender-billed Starling and the status of the species in
159 Dogu'a Tembien is unclear. Black-billed Wood-Hoopoe is an Abyssinian near-endemic of
160 *Acacia* woodland and has some red at the base of the bill or an entirely red bill in this area. Two
161 species belonged to the Sudan-Guinea Savanna Biome (SGSB). Green-Backed Eremomela and
162 Chestnut-crowned Sparrow-Weaver are species of *Acacia* and *Combretum* woodland.

163 Finally, we recorded a number of interesting species that are neither endemic nor biome-
164 restricted but that have restricted ranges or that can be more easily seen in Ethiopia than
165 elsewhere in their range. Abyssinian Roller (Photo 20.3) is an Ethiopian relative of Lilac-
166 breasted Roller, which is an intra-tropical breeding migrant of south and east Africa, and of
167 European Roller, an uncommon Palearctic passage migrant. Black-billed Barbet, Yellow-
168 breasted Barbet (Photo 20.4) and Grey-headed Batis are species from the Sahel and Northern
169 Africa but also occur in *Acacia* woodlands in the area.

170

171 **20.6 Birds Only Recorded in Forest Fragments**

172 Fifty-two bird species (36%) were only observed in the forest fragments during the formal bird
173 survey. Some of these species are indeed forest-dependent bird species but many other species
174 in this group also occur in gardens, cultivated land or other habitats that were not surveyed. The
175 majority of bird species in this group feeds on invertebrates or has an omnivorous diet that
176 includes invertebrates, fruits and seeds. Highlights in this group include various kingfishers,
177 barbets and woodpeckers. In the generally dry landscape, the observation of kingfishers often
178 comes as a surprise, but Grey-headed Kingfisher, Striped Kingfisher and African Pygmy
179 Kingfisher are species that not necessarily depend on the proximity of water. Grey-headed and
180 African Pygmy Kingfisher are outstanding birds to observe, the former with a grey head and
181 heavy red bill, the latter a delicate, minute kingfisher with pink cheeks, blue crest and rufous
182 underparts. The endemic Banded Barbet and Black-billed Barbet feed on insects and fruits, can
183 often be seen in the vicinity of fruiting trees and like all barbets feature a heavy bill surrounded
184 by modified feathers called bristles, and a distinctive bill notch and tooth in Banded Barbet.

185 Red-fronted Tinkerbird is a smaller barbet which is reported to be less sensitive to forest
186 disturbance than other barbets. The heavily-striped Nubian Woodpecker and the red-rumped,
187 endemic Gold-mantled or Abyssinian Woodpecker are obviously species of forest and
188 woodland. *Euphorbia* trees are a good spot to look for these species.

189 Other notable birds of interest that were only observed in forests during the formal survey
190 include Bruce's Green Pigeon, a colorful, stout pigeon almost exclusively found in the canopy of
191 fruiting fig trees where it is well camouflaged; Abyssinian Roller (Photo 20.3), a large bird with
192 brilliant blue wings and long tail streamers which is often seen perched high on trees or posts
193 along roads; African Paradise Flycatcher, a striking rufous and/or white bird with black crested
194 head, a blue eye ring and males have very long tail streamers, which can be rufous or white (also
195 frequently seen in gardens); Tacazze Sunbird, a large sunbird often found near flowers, including
196 *Aloe* flowers, the males with long tail streamers; and Village Indigobird, an interspecific brood
197 parasite of Red-billed Firefinch. Many more interesting species can be observed in the isolated
198 forests, but many of the most interesting birds such as the endemic and AHB species were
199 recorded with relatively low frequencies (see Appendix). Visiting different forests and visiting
200 forests more than once are the best options to optimize your birdwatching experience in the area.

201

202 **20.7 Birds of Forest and Other Woodland Habitats**

203 Forty-five bird species (26%) occurred in all surveyed habitat types during the formal survey, i.e.
204 in forests, exclosures and in grazed open woodland. Most species were typically birds of
205 grassland and savanna with the majority of bird species feeding on invertebrates and/or seeds.
206 Highlights among these forest and open woodland species are the endemic parrot Black-winged

207 Lovebird (easily heard because of its high-pitched screeching and often found nesting in
208 euphorbias; also feeds on the ground), Hoopoe (Photo 20.5), Hemprich's Hornbill (Photo 20.2)
209 and Abyssinian Ground Hornbill. Hoopoe (Photo 20.5) is a strongly territorial species when
210 nesting, with a prominent crest that can be fanned. The Ground Hornbill (locally called *Abo*
211 *Gumbah*, which translates as 'bowed father') is a tall (>100 cm) black bird with bare blue skin
212 around the eye and throat, a short open hollow chamber or casque at the top of the heavy bill,
213 exceptionally long eye-lashes, and in males, a patch of bare red skin on the throat. The birds can
214 fly and roost in (isolated) trees but are more often seen on the ground, in pairs or small (family)
215 groups, in grassland and farmland. Among the smaller common generalist species, Montane
216 White-eye is a brown-yellowish bird with characteristic bright white eye-ring, often occurring in
217 (mixed) flocks and in juniper trees; Variable Sunbird is a small nectar-feeding bird that hovers
218 like a hummingbird with glossy green head and purple breast band in the males; Northern Red
219 Bishop is a small species of tall grassland with striking pure orange mantle and red tail coverts
220 (when in breeding plumage); and Red-billed Firefinch and Red-cheeked Cordon-Bleu are petite
221 but colorful species associated to farmland and villages.

222 Twenty-nine bird species (17%) were recorded in forests and in exclosures but not in the
223 grazed open woodland during the formal survey. These bird species could be forest-dependent
224 species that tolerate disturbance and use the exclosures as sub-optimal forest habitat (e.g. for
225 feeding but not for breeding). Alternatively, these bird species could be species of open
226 woodland that have invaded the dry forest following fragmentation, isolation and internal
227 degradation of the forest, or these species are adapted to forest and open woodland but avoid
228 grazed woodland because it lacks certain resources such as shade. The diet of 50% of the birds
229 in this group consists of invertebrates. Highlights in this group include Greyish Eagle-Owl

230 (recently split from Spotted Eagle-Owl and often found in densely wooded gullies that run
231 through exclosures) (Photo 20.6); Abyssinian (Montane or Mountain) Nightjar (Photo 20.7), a
232 well-camouflaged bird that roosts in a concealed position on the ground and rocky outcrops
233 during the day; Blue-breasted Bee-eater (Photo 20.8), a green bee-eater with white cheeks,
234 rufous wings and purple breast band that often occurs in small groups and that after flying out
235 from a perch to hawk for insects usually lands in exactly the same spot (*aerial sallies*); Yellow-
236 breasted Barbet (Photo 20.4), a large barbet with yellow head and red bill associated to dry
237 acacia woodlands with dry river banks or termite mounds; and Scarlet-chested and Mariqua
238 Sunbird. Nightjars are notoriously difficult to identify but the species recorded in the area occurs
239 at higher elevation and has more extensive white in the outer tail than the very similar Sombre
240 (Dusky) Nightjar.

241 Only thirteen bird species (6%) occurred in exclosures and/or woodland but were never
242 observed in forests. Highlights are Rufous-crowned (Purple) Roller, a roller of dry areas with
243 tall trees (which was recorded in exclosures only) and Black-bellied Bustard, a large ground-
244 dwelling bird of tall grassland and savanna that appears to arrive in dry areas after rains.

245

246 **Box 1 Some Remarkable Bird Behavior**

247 A number of bird species that occupy forests and open woodland habitat in Dogu'a Tembien
248 deserves to be mentioned here because of their interesting behavior. **Clumping.** Speckled
249 Mousebird and Blue-naped Mousebird move through fruiting trees like squirrels and form
250 compact balls when roosting, a behavior called *clumping*. **Co-operative breeding.** Dominant
251 pairs of Speckled Mousebird are usually helped by 2-6 birds to assist feeding of the young and

252 incubating adults (*co-operative breeding*). **Duetting.** Tropical Boubou is a fairly common
253 species of woodland understorey and scrub vegetation with a distinct call which can be compared
254 to the sound of a rusty swing. The call is actually a duet, initiated by one bird (usually the male),
255 immediately followed by a different call of another, nearby bird (*antiphonal duet*). There are
256 many different types of duetting: birds may use the same or different calls, call simultaneously,
257 alternately or unsynchronised, and the duet may sound like a single bird calling or not. Other
258 species in the area that engage in duetting include Helmeted Guineafowl (antiphonal, different
259 calls, female initiates, only when breeding), Hamerkop (alternating or simultaneous, similar
260 calls), Greyish Eagle-Owl (antiphonal, similar calls, only occasionally and probably to seek
261 contact, Photo 20.6), Grey-headed Kingfisher (simultaneous, similar calls, in breeding or
262 territorial display), all hornbills (simultaneous or synchronised, similar calls), Yellow-breasted
263 Barbet (unsynchronised, Photo 20.4), Black-headed Bush-Shrike (Tchagra) (simultaneous or
264 alternating, male initiates), and Mocking Cliff-Chat (occasional, alternating, similar calls).

265 **Lekking.** Pin-tailed Whydah (Photo 20.9) is an inter-specific brood parasite, mainly on waxbills
266 (e.g. Crimson-rumped Waxbill and Yellow-bellied Waxbill). In the breeding season, the males
267 have a colorful breeding plumage with long black tail streamers (the four central tail feathers)
268 and gather in competitive breeding displays. **Wing-flashing.** Namaqua Dove has a long tail and
269 the males have an orange bill and black forehead, chin and throat. The male Namaqua Dove
270 flashes its rufous wings to deter predators and in courtship display (Photo 20.10).

271

272

273

274 **20.8 Recommended Birdwatching Sites**

275 Our data shows that exclosures have an important conservation value for birds of forest and
276 woodland habitat, but also that forests are the best sites for conservation of birds and for
277 birdwatching. Small landscape elements with woody vegetation in the immediate vicinity of
278 such forests, such as isolated remnant trees or wooded gullies are also interesting for
279 birdwatching. We suggest a few sites that are interesting for birdwatching (* highly
280 recommended) and once again stress that it is important to seek prior informed consent to visit
281 church forests and other holy sites including holy waters. Additional coordinates of sites worth
282 exploring for birds are given in the Supplementary Information.

283

284 *Dry Afromontane forests higher than 2000 m*

285 **Mai Be’ati** (13°38’51.5”N, 39°13’11.9”E), 6 ha, perimeter 1.2 km, 2271-2338 m (Photo 16.1).

286 Church forest at the base of a limestone cliff with a perennial spring and an adjacent grazing
287 enclosure with rocky gullies. Located 1 km from the main Mekelle-Hagere Selam road (100 m
288 descend). Good view in the forest canopy (mostly olive but also large figs and other species)
289 from the limestone cliff; also good site to spot Rock Hyrax.

290 **Haragua** (13°40’46.1”N, 39°09’32.5”E), 13 ha, perimeter 2.6 km, 1973-2229 m (Photo 16.9).

291 Fairly large church forest 3.6 km NNW of Hagere Selam. The church and a number of other
292 buildings are located at the base of a limestone cliff. Large isolated olive trees on the plateau
293 east of the forest are also interesting to look for birds.

294 **Waseya*** (13°40'47.3"N, 39°07'26.8"E), 49 ha, perimeter 3.4 km, 2014-2348 m (Photo 16.10).
295 Large church forest and enclosure 5.5 km NW of Hagera Selam. The church is located at the
296 lower end of the forest. A rocky gully bisects the entire forest. Key species include Black-
297 winged Lovebird, White-cheeked Turaco, Greyish Eagle-Owl, Black-billed Barbet, Hemprich's
298 Hornbill and Abyssinian (Black-headed Forest) Oriole.

299 **Chege** (13°39'21.3"N, 39°02'53.3"E, Photo 16.6) and **May Mirara** (13°39'09.1"N,
300 39°04'09.8"E, Photo 16.11), like Waseya, cover steep west-facing slopes and extend from the
301 edge of the plateau towards the lower limit of the dry evergreen montane forest and grassland
302 zone. Their bird fauna remains to be explored.

303

304 *Dry Afromontane forests, lower than 2000 m*

305 **Mheni*** (13°37'N, 39°21'E), 15 ha, perimeter 1.6 km, 1987-2002 m (Photo 16.5). Very open
306 *Acacia-Olea* woodland with a number of larger trees and euphorbias in and near the central
307 church compound, 0.6 km from the main Mekelle-Hagera Selam road, 3.7 km beyond the Geba
308 river bridge. Tall grass grows in between the trees in the rainy season. Key species include
309 Black-winged Lovebird, Greyish Eagle-Owl, Hoopoe, Black-billed Wood-Hoopoe, Banded
310 Barbet, Nubian and Gold-mantled (Abyssinian) Woodpecker, Grey-headed Batis and Montane
311 White-eye. The adjacent *hezaeti* spare grazing land is a good site for Clapperton's Francolin,
312 Black-bellied Bustard, and Red-backed Shrike, at least during the tall grass season.

313 **Geramesagu** (13°36'N, 39°20'E), 5 ha, perimeter 1.0 km, 1946-1973 m. Very open *Acacia-*
314 *Olea* woodland with a central grassy area, and a number of church buildings in the southern edge

315 of the forest, 1.6 km from the main Mekelle-Hagere Selam road, 3 km beyond the Geba river
316 bridge. Species composition is similar to Mheni.

317 **Sesemat*** (13°37'N, 39°19'E), 3 ha, perimeter 1.5 km, 1978-2044 m. Wooded gully and two
318 isolated patches of more or less dense olive woodland, 2.3 km S of Enda Maryam Tucul. Key
319 species include Black-winged Lovebird, Blue-breasted Bee-eater, Hemprich's Hornbill, Black-
320 billed Barbet, Gold-mantled (Abyssinian) Woodpecker, African Paradise-Flycatcher and
321 Montane White-eye. At dusk the forest and surrounding grazing land are good sites to see
322 Spotted Hyena.

323 **Minta** (13°40'N, 39°21'E), 3 ha, perimeter 1.2 km, 1964-2000 m. Wooded gully and small
324 *Acacia-Olea* woodland, 7 km NE of Enda Maryam Tucul (Photo 20.1; Photo 16.4). Key species
325 include Clapperton's Francolin, Eastern Grey Plantain-eater, Black-billed Wood-Hoopoe,
326 Hemprich's Hornbill, Red-billed Hornbill, Banded, Black-billed and Yellow-breasted Barbet,
327 Grey-headed Batis and Northern Black Tit.

328 Three additional church forests, located in Enderta, are worth visiting *en route* to Dogu'a
329 Tembien when leaving by car from Mekelle: the church forest and waterfall of

330 **Romanat***(13°34'31.5"N, 39°25'08.7"E); and the church forests of **Chenferes*** (13°36'41.1"N,
331 39°26'10.1"E) and **Amne Ayesgi** (13°36'49.4"N, 39°25'35.4"E) and the *Faidherbia* gallery
332 running between these two patches. Key species of Romanat include Tawny Eagle, Bruce's
333 Green Pigeon, Grey-headed Kingfisher, Black-billed Barbet, Violet-backed Starling and White-
334 billed Starling. Key species of Chenferes, Amne Ayesgi and the *Faidherbia* gallery include
335 Black-winged Lovebird, Abyssinian Nightjar, Blue-naped Mousebird, Abyssinian Roller, Grey-

336 headed Kingfisher, Blue-breasted Bee-eater, Black-billed Wood-Hoopoe, Black-billed Barbet,
337 Yellow-breasted Barbet, White-billed Starling and Red-billed Oxpecker.

338

339 **Supplementary Information**

340 Google Earth KMZ file containing locations with potential birdwatching interest.

341

342 **References**

343 Aerts R, Lerouge F, November E, Lens L, Hermy M, Muys B (2008) Land rehabilitation and the
344 conservation of birds in a degraded Afromontane landscape in northern Ethiopia. *Biodiversity*
345 *and Conservation* 17:53–69

346 Ash J, Atkins J (2009) *Birds of Ethiopia and Eritrea. An atlas of distribution.* Christopher Helm,
347 A&C Black Publishers Ltd, London.

348 Behrens K, Barnes K, Boix C (2010) *Birding Ethiopia. A guide to the country's birding sites.*
349 Lynx Edicions, Barcelona.

350 Carnaby T (2008) *Beat about the bush. Birds.* Jacana Media, Johannesburg.

351 Friis I, Demissew S, van Breugel P (2010) Atlas of the potential vegetation of Ethiopia. *Biol.*
352 *Skr. Dan. Vid. Selsk.* 58:1–307

353 Sinclair I, Ryan P (2003) *Birds of Africa south of the Sahara.* Struik Publishers, Cape Town.

- 354 Sodhi NS, Sekercioglu CH, Barlow J, Robinson SK (2011) Conservation of Tropical Birds.
355 Wiley-Blackwell, Oxford, UK.
- 356 Tilahun S, Edwards S, Gebre Egziabher TB (Eds) (1996) Important Bird Areas of Ethiopia. A
357 first inventory. BirdLife International and Ethiopian Wildlife and Natural History Society, Addis
358 Ababa.
- 359 Urban E, Brown L (1971) A checklist of the birds of Ethiopia. Addis Ababa University Press,
360 Addis Ababa
- 361 Van Perlo B (1995) Birds of Eastern Africa. HarperCollinsPublishers Ltd, London.
- 362

363 **Appendix I. Birds recorded in forest fragments (F), exclosures (EX) and grazed open**
 364 **woodland (G) in Dogu’a Tembien in northern Ethiopia.**

365

366 The species are listed with the following information:

367 Sequence number in “Birds of Ethiopia and Eritrea. An atlas of distribution”; principal English
 368 vernacular name (common name) (photograph number); scientific name; *E* or *P* to indicate
 369 whether the species is endemic to the Abyssinian plateau (Ethiopia and Eritrea) or a Palearctic
 370 migrant; AHB, SMB or SGSB to indicate whether the species is a biome-restricted species of
 371 the Afrotropical Highlands Biome, the Somali-Masai Biome, or the Sudan-Guinea Savanna
 372 Biome; frequencies derived from our survey, for forest (F), exclosure (EX) and grazed woodland
 373 (G). The frequencies can be interpreted as the probability to observe the species during a one-
 374 hour visit to a forest, exclosure or grazed open woodland (0.5 = 50% chance) (species without
 375 frequencies were observed outside the formal survey and frequencies could not be calculated).

376

Nr.	Common Name	Scientific Name	Note	Frequencies		
				F	EX	G
Family: NUMIDIDAE guineafowl						
2	Helmeted Guineafowl	<i>Numida meleagris</i>		0.01	0.05	
Family: PHASIANIDAE quails, francolins, stone partridge						
10	Clapperton's Francolin	<i>Francolinus clappertoni</i>		0.32	0.30	0.34
13	Erckel's Francolin	<i>Francolinus erckelii</i>	AHB	0.06		
15	Common Quail	<i>Coturnix coturnix</i>	<i>P</i>		0.09	
Family: ANATIDAE ducks, geese						
23	Egyptian Goose	<i>Alopochen aegyptiaca</i>		0.02		
Family: CICONIIDAE storks						
54	Black Stork	<i>Ciconia nigra</i>	<i>P</i>			
55	Abdim's Stork	<i>Ciconia abdimii</i>				
57	White Stork	<i>Ciconia ciconia</i>	<i>P</i>			
59	Marabou (Stork)	<i>Leptoptilos crumeniferus</i>				
Family: THRESKIORNITHIDAE ibises, spoonbills						
60	Sacred Ibis	<i>Threskiornis aethiopicus</i>				×
63	Wattled Ibis	<i>Bostrychia carunculata</i>	<i>E, AHB</i>	×		×
Family: ARDEIDAE herons, egrets, bitterns						
74	Cattle Egret	<i>Bubulcus ibis</i>	(<i>P</i>)			×
76	Black-headed Heron	<i>Ardea melanocephala</i>				

Nr.	Common Name	Scientific Name	Note	F	EX	G
Family: SCOPIDAE hammerkop						
86	Hammerkop (Hamerkop)	<i>Scopus umbretta</i>		0.03		
Family: FALCONIDAE pygmy falcons, falcons						
98	Common (Rock) Kestrel	<i>Falco tinnunculus</i>	P		0.02	0.09
111	Peregrine (Falcon)	<i>Falco peregrinus</i>	P	0.02		
Family: ACCIPITRIDAE snake eagles, harriers, goshawks, sparrowhawks, buzzards, eagles, etc.						
121	Black (Yellow-billed) Kite	<i>Milvus migrans</i>	(P)	0.03	0.04	
123	Lammergeier (Bearded Vulture)	<i>Gypaetus barbatus</i>				
138	Pallid Harrier	<i>Circus macrourus</i>	P	0.02	0.14	
139	Montagu's Harrier	<i>Circus pygargus</i>	P			×
141	Dark Chanting Goshawk	<i>Melierax metabates</i>		0.14		0.03
158	Augur Buzzard	<i>Buteo augur</i>		0.07	0.05	
161	Tawny Eagle	<i>Aquila rapax</i>		0.08		
167	African Hawk-Eagle	<i>Hieraaetus spilogaster</i>		×		
171	Long-crested (Hawk) Eagle	<i>Lophaetus occipitalis</i>				
Family: OTIDIDAE bustards						
180	Black-bellied Bustard	<i>Lissotis melanogaster</i>				0.09
Family: RALLIDAE rails, flufftails, crakes, etc.						
188	Rouget's Rail	<i>Rougetius rougetii</i>	E, AHB			
Family: CHARADRIIDAE plovers, lapwings						
218	African Wattled Plover (Wattled Lapwing)	<i>Vanellus senegallus</i>		×		
227	Three-banded Plover	<i>Charadrius tricollaris</i>		0.02		
Family: SCOLOPACIDAE sandpipers, stints, snipes, etc.						
249	Green Sandpiper	<i>Tringa ochropus</i>	P	×		
Family: PTEROCLIDIDAE sandgrouse						
304	Yellow-throated Sandgrouse	<i>Pterocles gutturalis</i>		0.02		
Family: COLUMBIDAE pigeons, doves						
309	Speckled Pigeon (Rock Pigeon)	<i>Columba guinea</i>		0.62	0.21	0.06
310	White-collared Pigeon	<i>Columba albitorques</i>	E, AHB	0.04		
315	Dusky Turtle Dove (Pink-breasted Dove)	<i>Streptopelia lugens</i>	AHB	0.48	0.04	0.03
Family: COLUMBIDAE pigeons, doves						
318	(African) Mourning (Collared) Dove	<i>Streptopelia decipiens</i>		0.13		
319	Red-eyed Dove	<i>Streptopelia semitorquata</i>		×		
320	Ring-necked Dove (Cape Turtle Dove)	<i>Streptopelia capicola</i>		0.27		
321	Vinaceous Dove	<i>Streptopelia vinacea</i>		0.44		
322	Laughing Dove (Palm Dove)	<i>Streptopelia senegalensis</i>		0.94	0.75	0.56
327	Namaqua Dove (20.10)	<i>Oena capensis</i>		0.09	0.35	0.13
328	Bruce's Green Pigeon	<i>Treron waalia</i>		0.13		
Family: PSITTACIDAE parrots, lovebirds						
332	Black-winged Lovebird	<i>Agapornis taranta</i>	E, AHB	0.22	0.02	0.06
Family: MUSOPHAGIDAE turacos, go-away birds, plantain-eaters						
336	White-cheeked Turaco	<i>Tauraco leucotis</i>	AHB			
340	Eastern Grey Plantain-Eater	<i>Crinifer zonurus</i>		0.11	0.04	
Family: CUCULIDAE cuckoos, coucals						
341	Jacobin (Black-and-white, Pied) Cuckoo	<i>Clamator jacobinus</i>		0.02	0.05	
346	Common (Eurasian) Cuckoo	<i>Cuculus canorus</i>	P	0.44	0.30	0.09
348	Klaas's Cuckoo	<i>Chrysococcyx klaas</i>		0.46	0.02	
350	Dideric (Didric, Diederik) Cuckoo	<i>Chrysococcyx caprius</i>		0.07		0.03
355	White-browed Coucal	<i>Centropus superciliosus</i>		0.01	0.02	
Family: TYTONIDAE barn owls						
356	Barn Owl	<i>Tyto alba</i>				
Family: STRIGIDAE true owls						
363	Greyish Eagle-Owl (20.6)	<i>Bubo cinerascens</i>		0.16	0.09	
367	Pearl-spotted Owlet	<i>Glaucidium perlatum</i>		×		

Nr.	Common Name	Scientific Name	Note	F	EX	G
Family: CAPRIMULGIDAE nightjars						
377	Abyssinian (Montane, Mountain) Nightjar (20.7)	<i>Caprimulgus poliocephalus</i>		0.07	0.11	
Family: APODIDAE swifts, spinetails						
393	Horus Swift	<i>Apus horus</i>				0.16
Family: COLIIDAE mousebirds						
395	Speckled Mousebird	<i>Colius striatus</i>		0.41	0.18	
396	Blue-naped Mousebird	<i>Urocolius macrourus</i>		0.15	0.04	
Family: CORACIIDAE rollers						
398	Rufous-crowned (Purple) Roller	<i>Coracias naevius</i>			0.14	
400	Abyssinian Roller (20.3)	<i>Coracias abyssinicus</i>		0.11		
401	European (Eurasian) Roller	<i>Coracias garrulus</i>	P			×
Family: ALCEDINIDAE kingfishers						
403	Grey-headed (Chestnut-bellied) Kingfisher	<i>Halcyon leucocephala</i>		0.18		
404	Striped Kingfisher	<i>Halcyon helicuti</i>		0.02		
408	(African) Pygmy Kingfisher	<i>Ceyx pictus</i>		0.05		
Family: MEROPIDAE bee-eaters						
414	Little Bee-Eater	<i>Merops pusillus</i>		0.02		
415	Blue-breasted Bee-eater (20.8)	<i>Merops variegatus</i>		0.40	0.23	
418	White-throated Bee-eater	<i>Merops albicollis</i>		×		
419	Green (Little Green) Bee-Eater	<i>Merops orientalis</i>		0.01		
422	European (Eurasian) Bee-Eater	<i>Merops apiaster</i>	P	0.02	0.04	0.22
Family: UPUPIDAE hoopoes						
424	(Common, Eurasian) Hoopoe (20.5)	<i>Upupa epops</i>	P	0.28	0.09	0.03
Family: PHOENICULIDAE wood hoopoes						
426	Black-billed Wood-Hoopoe	<i>Phoeniculus somaliensis</i>	SMB	0.42	0.16	
Family: BUCEROTIDAE hornbills						
430	Hemprich's Hornbill (20.2)	<i>Tockus hemprichii</i>	SMB	0.26	0.14	0.03
432	Red-billed Hornbill	<i>Tockus erythrorhynchus</i>		0.05		
Family: BUCORVIDAE ground hornbills						
437	Abyssinian (Northern) Ground Hornbill	<i>Bucorvus abyssinicus</i>		0.03	0.04	0.03
Family: RAMPHASTIDAE barbets, tinkerbirds						
438	Red-fronted Tinkerbird	<i>Pogoniulus pusillus</i>		0.10		
442	Banded Barbet	<i>Lybius undatus</i>	E, AHB	0.06		
444	Black-billed Barbet	<i>Lybius guifsohalito</i>		0.35		
447	Yellow-breasted Barbet (20.4)	<i>Trachyphonus margaritatus</i>		0.30	0.25	
Family: PICIDAE wrynecks, woodpeckers						
454	Eurasian (Northern) Wryneck	<i>Jynx torquilla</i>		×		
456	Nubian Woodpecker	<i>Campethera nubica</i>		0.04		
458	Gold-mantled (Abyssinian) Woodpecker	<i>Dendropicus abyssinicus</i>	E, AHB	0.07		
Family: PLATYSTEIRIDAE batises, wattle-eyes						
464	Grey-headed Batis (Puffback Flycatcher)	<i>Batis orientalis</i>		0.30	0.11	0.03
Family: MALACONOTIDAE helmetshrikes, bush-shrikes, puffbacks						
474	Black-crowned Tchagra (Black-headed Bush-Shrike)	<i>Tchagra senegalus</i>		0.14	0.53	0.44
479	Tropical Boubou	<i>Laniarius aethiopicus</i>		0.78	0.33	
481	(Northern) Brubru (Shrike)	<i>Nilaus afer</i>		0.03		
Family: LANIIDAE shrikes						
487	Red-backed Shrike	<i>Lanius collurio</i>	P	0.36	0.23	0.22
488	Isabelline (Red-tailed) Shrike	<i>Lanius isabellinus</i>	P		0.09	0.13
489	Lesser Grey Shrike	<i>Lanius minor</i>	P	0.02	0.04	0.31
494	Common Fiscal (Shrike)	<i>Lanius collaris</i>		0.07	0.04	0.34
495	Woodchat Shrike	<i>Lanius senator</i>	P			0.09
Family: ORIOLIDAE orioles						
497	Eurasian Golden Oriole	<i>Oriolus oriolus</i>		0.03		
499	Abyssinian (Black-headed Forest) Oriole	<i>Oriolus monacha</i>	E, AHB	×		

Nr.	Common Name	Scientific Name	Note	F	EX	G
Family: DICRURIDAE drongos						
501	Fork-tailed (Common) Drongo	<i>Dicrurus adsimilis</i>		0.05		
Family: MONARCHIDAE monarchs						
502	African Paradise-flycatcher	<i>Terpsiphone viridis</i>		0.13		
Family: CORVIDAE crows						
507	Cape Crow (Cape Rook, Black Crow)	<i>Corvus capensis</i>		0.03		0.03
511	Fan-tailed Raven	<i>Corvus rhipidurus</i>		0.06	0.02	
Family: PARIDAE tits						
514	Northern Black Tit	<i>Parus leucomelas</i>		0.07		
Family: HIRUNDINIDAE swallow, martins						
519	Black Saw-Wing (Rough-wing)	<i>Psalidoprocne pristoptera</i>		×		
521	Plain Martin (Brown-throated Sand-Martin)	<i>Riparia paludicola</i>		×		
524	Barn (Eurasian) Swallow	<i>Hirundo rustica</i>	P		0.12	0.06
526	Ethiopian (Lesser Striped) Swallow	<i>Hirundo aethiopia</i>		0.20	0.14	0.22
532	Northern (Common) House Martin	<i>Delichon urbicum</i>	P	0.10	0.04	0.09
Family: ALAUDIDAE larks						
542	Flappet Lark	<i>Mirafraga rufocinnamomea</i>		0.02	0.02	0.16
551	Greater Short-toed Lark	<i>Calandrella brachydactyla</i>	P	0.05	0.02	0.25
557	Thekla (Short-crested) Lark	<i>Galerida theklae</i>		0.14	0.25	0.62
Family: CISTICOLIDAE cisticolas, prinias, apalises, etc.						
562	Singing Cisticola	<i>Cisticola cantans</i>		0.07	0.44	0.19
566	Winding Cisticola	<i>Cisticola galactotes</i>		×		
576	Pectoral-patch (Pale-crowned) Cisticola	<i>Cisticola brunescens</i>			0.04	
578	Tawny-flanked Prinia	<i>Prinia subflava</i>		0.06	0.14	
582	Buff-bellied Warbler	<i>Phylloscopus pulchella</i>			0.04	0.03
585	Grey-backed Camaroptera (Bleating Warbler)	<i>Camaroptera brachyura</i>		0.87	0.84	0.53
Family: PYCNONOTIDAE bulbuls						
587	Common (Yellow-vented, Dark-capped) Bulbul	<i>Pycnonotus barbatus</i>		0.76	0.79	0.56
Family: SYLVIIDAE warblers						
603	Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	P	×		
607	(Eastern) Olivaceous Warbler	<i>Iduna pallida</i>	P	0.27	0.11	0.19
614	Willow Warbler	<i>Phylloscopus trochilus</i>	P	0.31	0.12	
615	(Common) Chiffchaff	<i>Phylloscopus collybita</i>	P	0.03		
613	Brown Woodland-Warbler	<i>Phylloscopus umbrovirens</i>		0.03		
618	Yellow-bellied Eremomela	<i>Eremomela icteropygialis</i>			×	
620	Green-backed Eremomela	<i>Eremomela canescens</i>	SGSB	0.11		
621	(Northern) Crombec	<i>Sylvietta brachyura</i>		0.18	0.11	
625	Blackcap	<i>Sylvia atricapilla</i>	P	0.08	0.04	
626	Garden Warbler	<i>Sylvia borin</i>		0.05	0.02	
628	Lesser Whitethroat	<i>Sylvia curruca</i>	P	0.16	0.49	0.34
632	Common (Greater) Whitethroat	<i>Sylvia communis</i>	P	0.02	0.11	0.19
Family: TIMALIIDAE babblers, chatterers, catbirds						
644	White-rumped Babbler	<i>Turdoides leucopygia</i>	SMB	0.05	0.11	
Family: ZOSTEROPIDAE white-eyes						
648	Montane (Broad-ringed) White-Eye	<i>Zosterops poliogastrus</i>	AHB	0.21	0.16	0.03
Family: STURNIDAE starlings						
652	Wattled Starling	<i>Creatophora cinerea</i>		0.02		
653	Greater Blue-eared (Glossy) Starling	<i>Lamprolornis chalybaeus</i>		0.87	0.37	0.41
662	Violet-backed (Amethyst, Plum-coloured) Starling	<i>Cinnyricinclus leucogaster</i>		0.10		
666	Somali Chestnut-winged Starling	<i>Onychognathus blythii</i>	SMB	0.11		
668	White-billed Starling	<i>Onychognathus albirostris</i>	E, AHB	0.23		
672	Red-billed Oxpecker	<i>Buphagus erythrorhynchus</i>		0.34		

Nr.	Common Name	Scientific Name	Note	F	EX	G
Family: TURDIDAE thrushes, chats						
675	Groundscraper Thrush	<i>Psophocichla litsipsirupa</i>		×		
678	Olive (Mountain, Northern Olive) Thrush	<i>Turdus olivaceus</i>		0.14		
682	(Common) Nightingale	<i>Luscinia megarhynchos</i>	P	0.11		
683	White-throated Robin (Irania, Persian Robin)	<i>Irania gutturalis</i>	P	0.30	0.63	0.88
684	Rüppell's Robin-chat	<i>Cossypha semirufa</i>	AHB	0.18		
694	Common (Eurasian) Redstart	<i>Phoeniculus phoenicurus</i>	P	0.06		
699	Isabelline Wheatear	<i>Oenanthe isabellina</i>	P			0.31
700	Northern Wheatear	<i>Oenanthe oenanthe</i>	P	0.02	0.02	0.34
705	Black-eared Wheatear	<i>Oenanthe hispanica</i>	P	0.03		
707	Abyssinian Black (Schalow's) Wheatear	<i>Oenanthe lugubris</i>		0.03	0.26	0.37
712	Blackstart (Black-tailed Rock Chat)	<i>Cercomela melanura</i>		0.08		
714	Rüppell's (Black) Chat	<i>Myrmecocichla melaena</i>	E, AHB			
716	Mocking (White-shouldered) Cliff Chat	<i>Thamnolaea cinnamomeiventris</i>		0.22	0.07	
717	White-winged Cliff Chat	<i>Thamnolaea semirufa</i>	E, AHB			
718	(Common, Rufous-tailed) Rock Thrush	<i>Monticola saxatilis</i>	P		0.04	0.06
719	Little Rock-Thrush	<i>Monticola rufocinereus</i>	AHB	0.26	0.35	0.03
Family: MUSCIPIDAE flycatchers						
721	Abyssinian Slaty Flycatcher	<i>Melaenornis chocolatinus</i>	E, AHB	×		
723	Pale (Pallid) Flycatcher	<i>Bradornis pallidus</i>		0.04	0.04	
726	Spotted Flycatcher	<i>Muscicapa striata</i>	P			×
728	African Dusky Flycatcher	<i>Muscicapa adusta</i>		0.01		
730	Semi-collared (Half-collared) Flycatcher	<i>Ficedula semitorquata</i>		0.02		
Family: NECTARINIIDAE sunbirds						
736	Scarlet-chested Sunbird	<i>Chalcomitra senegalensis</i>		0.17	0.04	
738	Tacazze Sunbird	<i>Nectarinia tacazze</i>	AHB	0.02		
742	Mariqua (Marico) Sunbird	<i>Cinnyris mariquensis</i>		0.14	0.07	
746	Variable (Yellow-bellied) Sunbird	<i>Cinnyris venustus</i>		0.84	0.96	0.66
Family: PASSERIDAE sparrows and petronias						
749	Chestnut-crowned Sparrow-weaver	<i>Plocepasser superciliosus</i>	SGSB	0.05		
756	Grey-headed (Swainson's) Sparrow	<i>Passer griseus (swainsonii)</i>	AHB	0.93	0.46	0.44
Family: PLOCEIDAE weavers and relatives						
765	Speckle-fronted Weaver	<i>Sporopipes frontalis</i>		×		
767	Baglafaecht Weaver	<i>Ploceus baglafaecht</i>	AHB	0.56	0.25	0.09
772	Rüppell's Weaver	<i>Ploceus galbula</i>	SMB		0.11	0.06
777	Village (Black-headed) Weaver	<i>Ploceus cucullatus</i>		0.44		
789	Northern Red Bishop	<i>Euplectes franciscanus</i>		0.25	0.09	0.03
792	Yellow-mantled (Yellow-shouldered) Widowbird	<i>Euplectes macrourus</i>		0.01		
794	Red-collared (Red-naped) Widowbird	<i>Euplectes ardens</i>				
Family: ESTRILDIDAE waxbills, firefinches						
798	Cut-throat (Finch)	<i>Amadina fasciata</i>		0.02		0.03
802	Red-billed Firefinch	<i>Lagonosticta senegala</i>		0.41	0.25	0.03
806	Red-cheeked Cordon-bleu	<i>Uraeginthus bengalus</i>		0.88	0.84	0.59
809	Yellow-bellied Waxbill (East African Swee)	<i>Estrilda quartinia</i>	AHB			
811	Crimson-rumped Waxbill	<i>Estrilda rhodopyga</i>		0.15		
817	African (Warbling) Silverbill	<i>Lonchura cantans</i>		0.02	0.05	
Family: VIDUIDAE indigobirds, whydahs						
822	Village (Common) Indigobird	<i>Vidua chalybeata</i>		0.12		
826	Pin-tailed Whydah (20.9)	<i>Vidua macroura</i>		0.10	0.02	
Family: MOTACILLIDAE wagtails, pipits, longclaws						
833	Yellow Wagtail	<i>Motacilla flava</i>	P			
835	Grey Wagtail	<i>Motacilla cinerea</i>	P			
838	African Pied Wagtail	<i>Motacilla aguimp</i>				

Nr.	Common Name	Scientific Name	Note	F	EX	G
Family: TURDIDAE wagtails, pipits, longclaws (continued)						
842	Tawny Pipit	<i>Anthus campestris</i>	<i>P</i>	0.03	0.02	0.16
844	Plain-backed Pipit	<i>Anthus leucophrys</i>		0.02	0.04	0.19
845	Tree Pipit	<i>Anthus trivialis</i>	<i>P</i>	0.01		0.03
Family: FRINGILLIDAE canaries, siskins, seedeaters						
848	Yellow-crowned Canary	<i>Serinus canicollis</i>				×
850	African Citril	<i>Serinus citrinelloides</i>	AHB	0.04		0.03
854	White-throated Seedeater	<i>Serinus xanthopygius</i>	<i>E</i>	0.38	0.26	0.28
861	Brown-rumped Seedeater	<i>Serinus tristriatus</i>	AHB	0.04		0.06
863	Streaky Seedeater	<i>Serinus striolatus</i>	AHB	0.06	0.02	0.03
Family: EMBERIZIDAE buntings						
865	Ortolan (Bunting)	<i>Emberiza hortulana</i>	<i>P</i>	0.15	0.07	0.03
868	Cinnamon-breasted (Rock) Bunting	<i>Emberiza tahapisi</i>		0.28	0.68	0.72
870	Golden-breasted Bunting	<i>Emberiza flaviventris</i>		0.13		

377