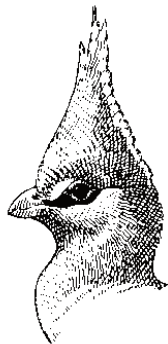


The forests of eastern Ghana, with special reference to birds and conservation status

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by Françoise Dowsett-Lemaire & Robert J. Dowsett

1. INTRODUCTION

Most of the dry forests of eastern Ghana are on hills and small plateaux at altitudes of 200-400 m, reaching 600-800 m on the highest ridges (as south of Kyabobo, and near Afadjato and Amedzofe). The highlands of eastern Ghana consist mostly of two long parallel ranges of hills stretching north-south, between 8°30'N (where they end in Ghana, but continue further north into Togo) and 6°35'N. South of 7°N only the eastern range remains, from the high ridges on the Togo border at Afadjato south-westwards towards the town of Ho at 6°35'N. The northern ranges are separated by a rather narrow valley passing through the towns of Nkwanta, Kadjebi, Jasikan to Hohoe. South of Ho, the coastal plain starts, and an interesting type of dry forest can be found in the Kalakpa floodplain in the wildlife reserve of that name.

Most of the natural vegetation of eastern Ghana in the past must have consisted of transition woodland and dry semi-evergreen rain forest (syn. semi-deciduous forest), with locally edaphic woodland and grassland on pebbly soils or rocky outcrops. A massive movement of population displaced by the building of the dam on the Volta happened in the late 1960s and 1970s which put so much pressure on land that, in many places, derived savanna has become the dominant vegetation. In the western half of the plateau (e.g. west of Hohoe and Jasikan), this often consists of scattered forest trees (*Cola gigantea*, *Ceiba pentandra*) amid fields, with coppice woodland and thicket regrowing on fallow land. In the eastern half, closer to the Togo border, rainfall is higher and farmbrush often dominant, with very little edaphic woodland: this is particularly obvious between Amedzofe and the Togo border, and between 7°35' to 8°15'N near the Togo border.

Some of the original vegetation has been protected in wildlife and forest reserves, which represent around 15% of the land under discussion (altogether just over 7000 km², 35 km wide x 210 km north-south). However, two of the forest reserves (Apepesu, Kobo River) are being transformed into exotic plantations, of Teak and other species, and others are suffering from illegal encroachment of gardens in the valley bottoms, where the vegetation was most luxuriant. On the other hand, a large section of country remains virtually untouched in the north-east: this is the hill range all along the Togo border east of the Nkwanta road, stretching from the southern limit of Kyabobo N.P. (8°18'N) to the eastern side of Apepesu (7°50'N). These hills are clothed in (mainly) transition woodland, with forest in gullies; on the wetter Togo side lies the most important stretch of forest in western Togo, the Assoukoko forest, with c. 100 km² protected in a reserve (Dowsett-Lemaire & Dowsett 2011b). Its name comes from the "Assoukoko" river (spelled Asukawkaw and Asuokoko in Ghana) which originates in Togo and crosses the Assoukoko forest into Ghana just north of Apepesu.

This report presents a summary of our observations in the forests of eastern Ghana over a period of seven years (2004-05 and 2008-11) and supersedes a report we produced on the subject in 2009 (*Dowsett-Lemaire Misc. Report 63*). There are two major wildlife reserves in the Volta Region: Kyabobo National Park in the north and Kalakpa Resource Reserve in the south. Wli (Agumatsa) Wildlife Sanctuary is no longer run by the Wildlife Division, following problems with the local communities (especially the uncontrolled bat hunting). The intermediate country has a number of forest reserves in a variable state of protection. There is a continuum, from north to south, between Chai River, Asuokoko River and Kobo River Forest Reserves, all three following a narrow range of hills between Nkwanta and Kadjebi. The Asukawkaw river forms the boundary between Asuokoko River F.R. and Kobo River F.R. These reserves as well as Apepesu, Togo Plateau and Odomi River (near Jasikan) are shown on p. 41 of Hawthorne & Abu-Juam (1995), except

for Chai River (inadvertently omitted?). The forest reserves fall under two Forestry District offices: Chai River and Asuokoko River under Nkwanta; Odomi River, Togo Plateau, Kabo River and Apepesu under Jasikan. The following localities were visited, from north to south (coordinates are given in Appendix). When they fall within the same 30 by 30 min. square, they are given the same number but different letters (e.g. 4a and 4b). Scientific names of bird species not in Table 2 are given in the text.

2. SALIENT FEATURES OF FOREST SITES

1. Chai River Forest Reserve (182 km²).

Visited on 2-4 April 2009. We did not visit Asuokoko River F.R. (85 km² according to a report produced by the District Manager, but 116 km² in Hawthorne & Abu-Juam 1995), wedged between Kabo River and Chai. Chai River F.R. extends north from Asuokoko along a line of hills ending to the south-west of Nkwanta. The easiest access is from the western side, especially at Tutukpene where the main road reaches the boundary. We camped near the forest's boundary at Tutukpene (at 160 m alt.). The hillsides were closely examined with binoculars and appeared to be covered by transition woodland or dry forest dominated by *Anogeissus*, and on thinner or steeper soils by woodland. Semi-evergreen rain forest is limited to valley bottoms along streams, but the main patch accessible from Tutukpene had been largely cleared for gardens, inside the reserve's boundary. There are other patches of tall forest, partly cleared, in isolated small groves along streams outside the reserve (on the road from Tutukpene to Nkwanta). From Tutukpene there are no paths into the woodland areas, and only one path into the valley forest, leading to illegal farms and the rocky stream. This is the only section we could explore, concentrating on the small fragments of forest left. *Erythrophleum suaveolens* was the commonest large tree near the stream; *Ceiba pentandra*, *Cola gigantea*, *Detarium senegalense*, *Ficus vogelii* (= *F. lutea*) and *Ricinodendron heudelotii* were also noted.

Wildlife. Excerpts from a report produced in 2003 by the Forestry Commission and kindly photocopied for us by the District Manager contain a list of mammal species thought to be present, according to local hunters. They include the usual three monkey species of eastern Ghana (Black-and-white Colobus *Colobus vellerosus*, Green and Mona Monkeys *Cercopithecus aethiops* and *C. mona*), Red River Hog *Potamochoerus porcus*, and surprisingly Warthog *Phacochoerus aethiopicus*. No mammals were heard on our visit, and the fragments of true forest left around Tutukpene are far too small for forest monkeys.

Many of the bird species characteristic of dry forest in eastern Ghana were observed here, including Leaflove, Baumann's Greenbul, Puvell's and Brown Illadopsis, Black-winged Oriole and Shrike-flycatcher. The forest is, however, drier than in Kabo or Togo Plateau to the south, and Kyabobo to the east, and not all forest species seem to reach Chai (no Blue-shouldered Robin Chat for instance), but prospection of other patches would no doubt reveal more species. Cassin's Hawk Eagle was in evidence, and as elsewhere in the east, its song was frequently imitated by Snowy-crowned Robin Chat *Cossypha niveicapilla*. One hawk eagle was seen diving into the forest to try and catch a bird. At least one pair of Piping Hornbills was present.

Conservation. There are vast expanses of transition and other woodland that look fairly intact, but the extent of forest in the valley bottoms is limited and probably generally at risk of being cleared for cultivation. Hawthorne & Abu-Juam (1995) gave this reserve Condition 6 (as for Asuokoko), but did not visit it themselves. Depending on one's point of view, this could be given Condition 2 or 3 if *Anogeissus* forest is included, but Condition 5 if only the groves of valley forest are considered. W. Hawthorne has confirmed (*in litt.*) that indeed only the condition of the rain forest was considered in this classification, and not that of transition woodland. There is a forest guard based at Tutukpene, but it seems clear that his relationship with the villagers is compromised as regards illegal clearing of forest for planks and gardens. It is a pity as there is still much land outside the reserve for gardens.

2. Kyabobo National Park (218 km²) and hills to the south.

Our main visits to Kyabobo were in July-August 2004 and February 2005 (Dowsett-Lemaire & Dowsett 2005a, 2007). We revisited the western edges on 18-20 October 2010, including Koue and Nazeni camp, and Laboum camp very briefly. The bridge on the Laboum stream was washed out and it was not possible to enter

the Park in the south. In 2010 rainfall was particularly high, totalling 1700 mm at the Park's headquarters near Nkwanta — rainfall in the Park is likely to be significantly higher than this.

The vegetation in Kyabobo includes semi-evergreen rain forest (valley bottoms and lower hill slopes, locally up to 4-500 m), transition woodland (widespread), woodland and pebbly grassland on hill tops. All details on habitat, annotated bird list, mammals and conservation are in the relevant publications cited. In addition, of forest species not included in our publications, one was added by S. Bearder (*in litt.*) in June 2005: Buff-spotted Flufftail, heard at night at Pawa camp. Latham's Forest Francolin was mentioned to us by wildlife guards as occurring in the denser forest near Shiare, outside the Park. Although we were sceptical at the time, we now accept it, in view of its presence on the Togo side (in Assoukoko forest, where still common); there was also a specimen collected near that forest by Büttner in 1895 (Reichenow 1891). Three species were found by D. Moyer near Shiare south of the Park in October 1994 (Moyer 1996): Olive Long-tailed Cuckoo, Rufous-sided Broadbill and Black-and-white Flycatcher. They are included in Table 2 below. Also included are another two species we found on the Ghana/Togo border north of Dikpéléou in March 2011: Purple-throated Cuckoo-shrike and Blue-headed Crested Flycatcher. Koue (at 8°31'N) on the Togo border at the northern edge of the Park is at the northern limit of range for many forest species in Ghana. In Kyabobo Lagden's Bush-shrike *Malaconotus lagdeni* (Dowsett-Lemaire & Dowsett 2007) has been re-identified as a yellow morph of Fiery-breasted Bush-shrike, mostly because of the voice (series of short whistles).

The Manager of Kyabobo N.P. (Luri Kanton *in litt.* 2011) confirmed that Black-and-white Colobus were still present in 2011, on the Koue river.

3. Kabo River Forest Reserve (136 km²).

Visited on 27-28 March 2009 (Okwe), 30-31 March (near Asukawkaw river) and revisited (Asukawkaw) on 15-16 January 2010 and (Okwe) on the morning of 21 October 2010.

Situated north-west of Kadjebi, the reserve is accessible from the south-eastern edge (Asatu-Gyamurume) and from the road crossing it between Apesokubi and Asukawkaw. Most of the forest either side of the Asukawkaw road has disappeared to be replaced by Teak plantations; the bits left are mainly transition woodland and dry woodland. This is where Hawthorne & Abu-Juam (1995) had situated their study plots (see p. 156).

Today the only area still worth visiting is the south-eastern edge near Gyamurume. The rough track from this village leads to a dead end (hamlet of Okwe) on the reserve's boundary, where we camped in 2009, in a cocoa farm. There is a strip of tall forest along a stream, mixed with Teak, and across it a hunters' path leads uphill to a ridge with secondary dry forest at an altitude of 400 m. The dominant trees there are *Albizia adianthifolia* and *Lonchocarpus sericeus*, with also *Cola gigantea*, *Lecaniodiscus cupanoides*, *Mala-cantha alnifolia*, *Zanthoxylum xanthoxyloides* etc.; the undergrowth is impenetrable in places.

Wildlife. No mammals were heard at night (no hyrax especially) and conversation with one local cocoa farmer was limited by a language barrier.

Some birds of interest were recorded, including Capuchin Babblers in two places along the stream; species limited to the taller forest in the valley included Fire-crested (White-tailed) Alethe, Rufous-crowned Eremomela and Square-tailed Drongo. As in Odomi there is a high density of Blue-shouldered Robin Chats in secondary growth or thickets, and although they were not yet in full song (March), their prolonged subsongs included many imitations (of Black, African Emerald and Olive Long-tailed Cuckoos, Spotted Honeyguide, Grey-headed Bush-shrike *Malaconotus blanchoti* and Grey-crowned Negrofinch). All of these species were heard locally except the Olive Long-tailed Cuckoo, presumably out of season. The secondary, dry forest on the slopes held a species of special interest, the Sooty Boubou, of which a pair was heard and glimpsed close to the ground. Fiery-breasted Bush-shrike was also heard and seen, as well as the understorey species that are usual in eastern Ghana (Puvél's and Brown Illadopsis, Baumann's and White-throated Greenbuls, Red-cheeked Wattle-eye etc.).

The transition woodland and degraded forest near Asukawkaw had Cassin's Hawk Eagle and African Barred Owlet. Helmeted Guineafowl survives in the *Anogeissus* transition forest. Piping Hornbills remain common in this area. The Shining-blue Kingfisher is known from the Asukawkaw River (F. Walsh in Grimes 1987).

Conservation. Hawthorne & Abu-Juam (1995) gave it Condition 5, and this was at a time where there was still some decent forest near the main Asukawkaw road. We would not disagree with this classification, and the state of the forest has been getting worse since.

4a. Apepesu Forest Reserve (61 km²).

Visited 28-29 March 2009, and briefly on 21 October 2010. This reserve is east of Dapaah junction south of Nkwanta, and is in the wettest region of eastern Ghana. In the plain between 7°35'N and 8°15'N and east of 0°30'E there is no savanna woodland, only fragments of tall rain forest and farmbush derived from forest; very small areas of transition woodland occur on raised pebbly surfaces. Species such as Sharpe's Apalis and Rufous-crowned Eremomela can be found even in small forest fragments by the roadside, as near Yadzo and Menuso. Apepesu F.R. is crossed by a small road between Pampawie north to Okrakrom; the width of the reserve here (per GPS) is 5.1 km north-south. Unfortunately, most of this tall, luxuriant forest has been cut and replaced by Teak plantations. There are only two small patches of forest left, the biggest (at the northern end) being 800 m across. This is where we camped in 2009, at an altitude of 250 m. The forest reserve continues to the east, uphill, where it is clothed with drier forest or transition woodland; this is inaccessible on a short visit but parts could be reached in a few hours walk on footpaths.

Wildlife. Despite the absence of streams in the main patch seen, it is humid enough to have one *Criniger* species (Red-tailed), Sharpe's Apalis, Rufous-crowned Eremomela and Square-tailed Drongo. It rained most of the time we spent there in March, and this is probably what prompted a Buff-spotted Flufftail to call in the morning drizzle from thickets just outside the forest (this species being active only in the main rains). A pair of large bush-shrikes was seen briefly in the canopy of tall trees (in 2009), of which one was singing (tape-recorded): they both had yellow underparts and were apparently the yellow morph of Fiery-breasted Bush-shrike. The song consisted of series of short, slightly ascending whistles at the rate of one/second (as is usual in this species), and was identical to that tape-recorded in western Ghana (Opro River F.R.) of a red-breasted bird. They were not relocated on our second visit. We noticed no mammals in this small patch.

Conservation. The destruction of the most luxuriant forest in the flat section of Apepesu was, in our view, an incalculable error. Hawthorne & Abu-Juam (1995) visited a small patch left near Pampawie at the southern end, and gave the forest Condition 5, and we would agree with this.

4b. Tolome area.

Within the same Atlas square this area was explored on 29-30 March 2009, and briefly on 22 October 2010. Forest on the Wawa river (from the Togo side) was seen on 29-30 March 2011. This is very close to the Togo border, and the Wawa river forms the boundary in a valley below impressive hills. The hills on the Ghana side are covered mostly in transition woodland, with forest in the gullies. The village of Tolome is several hours walk from the hills (which we did not reach) and has mainly remnants of forest along streams, and farmbush.

Wildlife. Hunters interviewed mentioned Crested Guinea fowl and three species of monkey as still present in the hills on the Togo border (Green and Mona Monkeys, as well as Black-and-white Colobus); it is possible they still occur inside Apepesu F.R. in the hilly section. They, and also Spot-nosed Monkey, are recorded from Assoukoko forest on the Togo side. Birds of note heard in secondary forest and transition woodland near Tolome on 29-30 Mar 2009 included African Barred Owlet (common), Finsch's Flycatcher Thrush (on one stream) and Kemp's Longbill, the latter probably close to the north-eastern limit of distribution in Ghana (it was not recorded in Kyabobo). Square-tailed Drongo and Fork-tailed/Velvet-mantled Drongo were seen close to each other at Tolome, Square-tailed being inside the forest (riparian) and "Velvet-mantled" on the edges.

Forest on the Wawa river produced, *inter alia*, African Finfoot, Shining-blue Kingfisher, Piping Hornbill, Swamp Palm Bulbul, Many-coloured Bush-shrike, Crested Malimbe (at its northern limit for eastern Ghana) and Blue-billed Malimbe (nesting on the river). Cassin's Hawk Eagle was seen near the Wawa river as well as on the edge of Apepesu.

5a. Odomi River Forest Reserve (16 km²).

Visited on 24-25 March 2009 and morning of 23 October 2010. This is situated on a narrow hill

range (north-south) just south of Jasikan. It can be approached from the west (Bowiri, Amanforo) or from the east (Bodada). The eastern road reaches the edge of the forest reserve 3 km south of Bodada. We visited the eastern edge twice. The foothills of the reserve have been planted with Teak *Tectona grandis*, and *Terminalia ivorensis*, and a few tracks had been opened just for exploitation. Unfortunately no footpaths enter the natural forest above the plantations. The forest has a very broken canopy (*Ceiba*, *Albizia* sp., *Cola gigantea*) and is underlain with impenetrable thickets.

Wildlife. Mammals recorded were Palm Civet *Nandinia binotata* and Tree Hyrax sp. *Dendrohyrax* sp. nov., both heard at night.

Birds were recorded from patches of secondary forest in the foothills and from the edges of the natural forest above. Species of note included Nkulengu Rail and African Barred Owlet in some numbers (both heard just after dusk), a territorial Western Banded Snake Eagle *Circaetus cinerascens*, Spotted Honeyguide (singing), Leaflove, Baumann's Greenbul, Blue-shouldered Robin Chat, Black-and-white Flycatcher, Shrike-flycatcher, Red-cheeked Wattle-eye, Brown and Puvell's Illadopsis, "Velvet-mantled" Drongo and Fiery-breasted Bush-shrike. We saw a very strange colour morph of Double-toothed Barbet *Lybius bidentatus* on the edge, with completely whitish belly (except for a thin dark breast band) and white wing-bar! Sooty Boubou and Crested Malimbe were added on our second (October) visit.

Conservation. Some of the forest reserve has been converted to plantation; the natural forest may have suffered from fires as the canopy has been opened up. The open character of the canopy can also be caused by the steep gradient. The western edge needs to be visited to assess the extent of natural forest left. Hawthorne & Abu-Juam (1995) qualified this forest as "Condition 6" (i.e. no significant forest left = almost all deforested with plantation, remnants with little chance of surviving 10 years), but they did not visit it themselves and the eastern edge that we saw would qualify rather as "Condition 4" (i.e. mostly degraded = obviously disturbed and patchy, heavily disrupted canopy).

5b. Togo Plateau Forest Reserve (150 km²).

Visited on 25-26 March 2009. This is in the same Atlas square as Odomi. It covers a high plateau with steep slopes, peaking around 600-700 m, to the west of Hohoe and south-west of Jasikan. The forest reserve can be approached from roads on the western and northern sides. The District Manager informed us that there are some Teak plantations around the south-western edges and that we would find better forest in the north. From Jasikan, we drove south-west to Takrabe and then on to Aboabo village, right on the northern edge of the reserve, at 185 m. A footpath from the village leads into a gully with forest along an important stream, whereas the open, tangled forest on the steep slopes above this remains inaccessible. Large forest trees in the valley or lower slopes include *Ceiba*, *Celtis* spp., *Cola gigantea*, *Erythrophleum suaveolens*, *Ficus mucoso*, *Milicia excelsa*, *Piptadeniastrum africanum*, *Terminalia superba* and *Triplochiton scleroxylon*. A large proportion of the taller forest inside the reserve boundary had been cut down for gardens (plantain and cocoa).

Wildlife. Mammals heard (pers. obs.) were Tree Hyrax sp., Mona Monkeys, Thomas's Galago *Galagoides thomasi* and Palm Civet. Hunters confirmed the disappearance of Black-and-white Colobus, hunted by the previous generation but now extinct. Bushbuck *Tragelaphus scriptus*, Red River Hog and Maxwell's Duiker *Cephalophus maxwelli* are still present (per hunters).

Despite extensive deforestation, a large number of bird species was recorded, and in particular the fragments left near the stream harboured several species that are highly localized in eastern Ghana, such as both *Criniger* bulbuls (Western Bearded and Red-tailed), Fire-crested (White-tailed) Alethe, and also Finsch's Flycatcher Thrush, Sharpe's Apalis and Blue-billed Malimbe (with nests over the stream). A small kingfisher heard a few times near the stream was identified as White-bellied. Baumann's Greenbuls, Kemp's Longbills and Little Green Sunbirds were among the many species of secondary growth or farmbrush. We saw up to 15 Piping Hornbills together. An interview with experienced hunters was organized in the village of Aboabo, and their state of knowledge was tested and found to be good (knowledge of voice, description). White-crested Tiger Heron, Latham's Forest Francolin, Great Blue Turaco, Fraser's Eagle Owl and Yellow-casqued Hornbill were useful additions provided by them.

Conservation. The forest on some ridges or higher slopes of the "Togo Plateau" appears largely intact

(as examined with binoculars from the roads), but some of the narrower, rocky ridges bear only transition woodland or even wooded grassland. The steep slopes near roads are severely damaged by fires, and the valley bottoms, as seen at Aboabo, largely deforested. Hawthorne & Abu-Juam's (1995) classification as "Condition 6" appears excessively pessimistic, based on assessment of forest conditions near Tayi in the south-west. Somewhere between Condition 4 and 5 appears more realistic, depending on the condition of the reserve in the west (not visited). Although villagers at Aboabo complained that the government refused to give them the forested land in the valley bottom (which of course is more productive in the short term), they have already cleared large portions of this illegally for gardens and the fragments left may not survive for long. This would lead to local extinctions of some bird species that depend on sheltered conditions in valleys (e.g. *Criniger* bulbuls and other examples given above).

6a. Likpe Todome.

This area, 20 km east of Hohoe, was visited on 24-25 February 2010, mainly because the high ridge which follows the Togo border is much more accessible than near Wli. Our main purpose was to investigate the avifauna of the rocky hill grassland, which did produce interesting species such as Common (European) Rock Thrush *Monticola saxatilis*, Rock-loving Cisticola *Cisticola aberrans*, Long-billed Pipit *Anthus similis*, Alpine Tachymarptis *melba* and Mottled Swifts *T. aequatorialis*. The forest remnants on the slopes and in the foothills are very degraded by fires and cultivation; Gabon and Cardinal Woodpeckers *Dendropicos fuscescens* occur together, Yellow-mantled Weavers were rebuilding nests not far from two nests of Red-headed Malimbe. What we assume to be Velvet-mantled Drongo (closely related to Fork-tailed) was in farmbush in the foothills, an area without any woodland.

6b. Wli Falls.

This Wildlife Sanctuary (3 km²) was effectively abandoned to local hunters in c. 2010. We visited the then Sanctuary in February 2005 and details of the results can be found in Dowsett-Lemaire & Dowsett (2005b). One species reported by Moyer (1996) has not been confirmed in eastern Ghana: Red-vented Malimbe. In the absence of *Raphia* palms there, and on the Togo side (pers. obs. in 2011), this *Raphia* specialist was either a vagrant, or Moyer meant another species; his field notes could not be found again (D. Moyer *in litt.* 2005). Piping Hornbill was observed in the gorge; it does not appear to be common elsewhere in this square (we have no records from Afadjato itself).

6c. Mount Afadjato and Dagbo Falls.

Visited on 1-3 April 2008, 16-19 January 2009 (when we were accompanied by Ben Phalan), 23-24 October 2010 and 5-6 May 2011. An area of tall farmbush north of Afadjato was seen only in April 2008, and the Dagbo Falls only in January 2009, Afadjato itself on each visit. We always based ourselves at the rest house at Liati Wote, which is also surrounded by interesting farmbush and gardens with forest remnants (even Nkulengu Rail can be heard right behind the rest house).

The most sheltered forest is in the gullies, such as along the path to Dagbo Falls, and in the foothills immediately below Mt Afadjato (north of the footpath to the summit). Forest on the western slopes is more open, and gets increasingly so with altitude. The summit area has limited grassland and scrub; there are some rocky outcrops to the north (e.g. Aduadu Mountain). The summit of Afadjato is not as high as indicated on some maps (885 m on the Road Map at 1:850,000, repeated by Ntiamoa-Baidu *et al.* 2001) but nearer 790 m, as measured with an accurate GPS on several visits.

Some of the important large trees in the gully leading to Dagbo Falls were *Albizia* spp., *Alstonia boonei*, *Bombax buonopozense*, *Ceiba pentandra*, *Distemonanthus benthamianus*, *Dracaena arborea*, *Ficus mucoso*, *Milicia excelsa*, *Piptadeniastrum africanum*, *Pycnanthus angolensis*, *Terminalia superba* and *Zanthoxylum gillettii*. Below Afadjato *Khaya grandifoliola*, *Parkia bicolor*, *Ricinodendron heudelotii* and *Triplochiton* also occur, whereas further up the slope the drier forest has more *Antiaris* and *Ceiba*, also *Albizia adianthifolia*, *Azelia africana*, *Cola gigantea* and *C. millenii*, *Lecaniodiscus cupanoides*, *Morus mesozygia*, *Nesogordonia papaverifera*...

Wildlife. Mona Monkeys were seen on some visits and appeared rather tame (on Afadjato); Spot-nosed were re-

ported to us by staff at the tourist centre. Thomas's Galago is in the thickets right near the rest house at Liati Wote. Tree Hyrax sp. is common in the forested hills.

A few forest birds are found only in the more sheltered forest at the bottom, such as Red-tailed and Western Bearded Greenbuls and Chestnut Wattle-eye near Dagbo Falls, Rufous-sided Broadbill, Fire-crested (White-tailed) Alethe, Finsch's Flycatcher Thrush and Chestnut Wattle-eye at the foot of Afadjato. Red-cheeked Wattle-eyes and Baumann's Greenbuls are some of the characteristic species of low thickets on the more open forested slopes. African Barred Owlets were more noisy in the rains (playback in January failed to provoke any, but they were heard in April and May). Our only record of Dusky-blue Flycatcher east of the Volta comes from farmbush just north of Afadjato (April 2008). Our only record of Yellow-throated Tinkerbird (18 January 2009) was of one bird singing in farmbush at Liati Wote, then moving on while a Yellow-rumped Tinkerbird started singing in the same area.

Conservation. The forest at Dagbo Falls depends on the community of Liati Wote, and although the falls are advertised as an area of ecotourism (and you do have to pay a fee to visit them), farmers and loggers seem to have a free hand in the area, all the way to the falls. This is an example of how a community cannot get its act together.

The forest around Mt Afadjato receives a certain amount of protection thanks to a joint project of the Ghana Wildlife Society and Gbledi community, funded by the Dutch cooperation. Unfortunately some of the forest at the bottom falls out of the "boundary" and has recently (2011) been felled, including right on the edge of the tourist picnic area. In general, the more sheltered forest where Western Bearded Greenbul and some other species take refuge is under great threat.

7. Biakpa and Amedzofe.

Forest and farmbush near Biakpa (around Paradise Lodge) was visited on 3-4 April 2008. The Amedzofe area was visited on 4-5 April 2008, 3-4 March 2009, 24-26 October 2010 and 6-10 May 2011. On the last two visits we concentrated on the remnants of forest and thicket situated on a small plateau immediately behind (to the east of) the Government rest house. On the first two visits, we were based at the Mount Gemi rest house.

The forests at Amedzofe are the highest in altitude in the Volta Region, reaching almost 800 m. Thus *Polyscias fulva*, a near-endemic Afromontane tree, can be seen behind the Government rest house. *Parkia filicoidea* also occurs, but a representative list of trees was not established. *Harungana madagascariensis* is dominant in derived thickets. There is open grassland on Mount Gemi, as well as some short woodland and rocky outcrops on the slopes. Apart from Mount Gemi itself, most of the area has been cultivated at one time or another. No forest is protected. The valley around Biakpa is also much cultivated. Secondary forest remains mostly along streams, although some gardens are cut right to the edge.

Wildlife. It seems that monkeys have generally disappeared around Amedzofe; some Monas and Spot-nosed were heard in a gully near Paradise Lodge (2008). The Tree Hyrax sp. is widespread. Birdwise Amedzofe has a longer list than most other localities and is apparently the only site east of the Volta for a number of forest birds: Black Bee-eater (a single bird, discovered on our very last visit), White-tailed Ant Thrush (one discovered breeding in October 2010 behind the Government rest house), Tit-hylia (seen on both visits to the forest behind the rest house), Blue-throated Brown Sunbird (one seen and heard on our last visit) and Western Black-headed Oriole. The last was known from one specimen collected by Baumann in 1894 at Amedzofe, and was re-discovered only in May 2011, when we saw an adult and immature. Orioles had been systematically checked at all localities in eastern Ghana and invariably found to be Black-winged, also detected by their distinctive contact calls (a single or double whistle). There is a small population of Yellow-throated Tinkerbirds on the western slopes (below Mount Gemi), and one was also heard behind the Government rest house.

One Buff-spotted Flufftail was heard on a misty morning on 10 May 2011, in very dense thicket. Narina's Trogon appears rare, as just one was singing in October 2010. A Cassin's Honeybird was seen at close range in October 2010, the most northerly location east of the Volta, except that there was also a brief possible sighting at Kyabobo (Laboum valley). Tiny Sunbird was well seen (and heard) on two visits (2010-11), and two were also heard at Afadjato in 2010. Sooty Boubous were discovered only on our third

visit (October 2010) when they were calling everywhere in thickets, including near both rest houses. They were still fairly noisy in May 2011, but can easily be overlooked in the dry season when more quiet. We had excellent views of Fiery-breasted Bush-shrike in 2010 and 2011 (the red-breasted morph).

Conservation. Nothing is protected, and a new motorway opened in 2011 has erased much vegetation (mostly secondary forest or thickets) on the sides of the old road that links Vane and Biakpa to Ho (south) and the Hohoe road (Vume) to the north. The manager of the Paradise Lodge is interested in organizing nature walks and would like to see some of the forest protected, but it is not clear how.

8a. Tanyigbe.

Visited on 26-27 February 2010. This is part of the last range of hills at the southern end of the eastern highlands, stretching all the way to the town of Ho. Tanyigbe is on the same ridge as the small Klemu Headwaters Forest Reserve (11 km²) a few km to the north, which we could not reach. The village of Tanyigbe is at the end of a cul-de-sac branching off the road to Tokokoe, north-east of Ho. The dense vegetation on the hill (c. 400 m alt.) consists of transition woodland and dry forest, with some lush growth on streams below the village. Important trees in the transition woodland are *Anthocleista djalonensis*, *Berlinia grandiflora* (a forest tree found also on the Togo highlands further east), *Daniellia oliveri*, *Lannea barteri*, *Pterocarpus erinaceus* and *Vitellaria paradoxa*. *Berlinia* and *Daniellia* are particularly common.

Wildlife. The forest on the hillside is rather dry, and the list of forest birds not very extensive, but characteristic species include the usual Leaflove, Baumann's Greenbul, Kemp's Longbill, Red-cheeked Wattle-eye, Puvel's and Brown Illadopsis etc. Nkulengu Rails were heard not only on the slopes but right on the ridge in dry forest. Honeyguide Greenbul and Purple-throated Cuckoo-shrike are common in the riparian vegetation at the foothills. The Tree Hyrax sp. is present, despite the small size of remnants; it was heard at night as usual.

8b. Dafo border crossing.

Forest on the Togo border crossing just east of Dafo (road to Klouto and Kpalimé) was examined briefly on 3 March 2009 and for longer on the morning of 24 February 2010. This forest is part of the more extensive forested hills of Klouto/Misahöhe in Togo. On the Ghana side, it stops a short distance (100-200 m) west of the border, as one drops down into the valley of Dafo. The forest is wetter there than at Tanyigbé, with species such as Crested and Red-headed Malimbés. However, there is so little forest on the Ghana side that it is unrealistic to hope to get a good bird list here.

9. Kalakpa Resource Reserve (320 km²).

This reserve lies in the coastal plain of south-eastern Ghana. The broad galleries of forest in the north of the Park belong to a different ecological category. The canopy is fairly light, and the understorey in parts extremely dense. Much of the forest floods in the rainy season. Full details on habitat and birds are given in Dowsett-Lemaire & Dowsett (2011a). The reserve was visited seven times between 2005 and 2011.

3. FOREST FAUNA OF EASTERN GHANA

A comparison per half degree square (30 x 30 min.) of the most important forest mammal and bird species is given in **Tables 1 and 2**. We are concerned with nine squares, from roughly north to south and west to east, Chai River = 8°N, 0°E; Kyabobo = 8°N, 0°30'E (including Koue, marginally in the square north, and Shiare-Dikpéléou to the south of the Park); Kabo River = 7°30'N, 0°E; Apepesu = 7°30'N, 0°30'E (including south to Poasi/Menuso, and Tolome near Togo border up to the Wawa river); Odomi River and Togo Plateau = 7°N, 0°E; Wli, Afadjato and Likpe Todome = 7°N, 0°30'E; Amedzofe and Biakpa = 6°30'N, 0°E; Tanyigbe and Dafo border = 6°30'N, 0°30'E; Kalakpa = 6°N, 0°E.

Biogeographical comments. Of the forest galagos, Thomas's remains unknown in western Ghana, but appears widespread in the Dahomey Gap, including the forests of western Togo and southern Benin (pers. obs. 2009 & 2011). *Dendrohyrax* sp. nov. is an undescribed species of tree hyrax that replaces *D. dorsalis* from Kalakpa eastwards. It has very distinctive vocalizations (tape-recorded at Kalakpa and in Benin), far more complex than

Table 1. Selected mammal species in the forests of Volta Region (duikers are not included as, apart from Maxwell's Duiker, the identity of other spp. poses problems). E = extinct. Records of hyraxes are based on pers. obs., as well as *Galagoides thomasi* (with additional data by S. Bearder for Kyabobo). Where based on interviews, records of monkeys are in (). We held no interviews for Kabo River and it is not included as we had no records.

	Chai	Kyab	Apep	Togo	Afad	Amed	Tany	Kala
Primates								
<i>Galagoides thomasi</i>	-	x	-	x	x	x	-	x
<i>Cercopithecus aethiops</i>	(x)	x	(x)	-	-	-	-	x
<i>C. mona</i>	(x)	x	(x)	x	x	x	-	x
<i>C. petaurista</i>	-	-	-	-	(x)	x	-	x
<i>Colobus vellerosus</i>	(x)	(x)	(x)	(E)	-	-	-	x
Hyraxes								
<i>Dendrohyrax dorsalis</i>	-	-	-	-	-	-	-	x
<i>Dendrohyrax</i> sp. nov.	-	-	-	x	x	x	x	x
<i>Procavia ruficeps</i>	-	x	-	-	-	-	-	-

those of the ordinary Tree Hyrax. We heard it in western Togo at Bénali and Kpété Béna (south and east of the town of Badou) and at Klouto, and it should be more widespread there (especially on the Danyi Plateau, opposite Afadjato and Wli). We found it in southern Benin from Niaouli (Allada) north to Tobé and Kouffé (near Bantè). Although we initially thought it might be a *Procavia* (known from inselbergs in northern Ghana, and also in Togo and Benin), observations by S. Bearder and J. Oates in Okomu forest in south-west Nigeria suggest that it is an undescribed species of *Dendrohyrax*. The voice of animals tape-recorded in south-west Nigeria has been compared to what we recorded in Benin and Ghana (Kalakpa) and found to be identical (S. Bearder *in litt.*). Two specimens of *Dendrohyrax* from Okomu are in the British Museum and await a closer examination (J. Oates *in litt.* 2009). Finally, we heard the voice of *Procavia ruficeps* in Benin in 2011 (animals seen at close range on rocks, and calling by day). It differs from that of *Dendrohyrax* sp. in several respects. At Kalakpa *Dendrohyrax* sp. and *D. dorsalis* coexist and occupy different territories in forest (Dowsett-Lemaire & Dowsett 2011a). In the light of new information on the distribution of *Dendrohyrax* sp. in Togo (it is definitely absent from Assoukoko forest), we believe that the animal we saw in Kyabobo in February 2005, by day on a log below South Repeater, was a *Procavia* and not a *Dendrohyrax*. It was heard later in the morning, but too distantly to take notes.

Table 2. Guineo-Congolian bird species and other forest species recorded from the forests of Volta Region. The Kyabobo column includes six species recorded in the hills to the south (see text above). () = hunters' reports, v = vagrant.

	Chai	Kyab	Kabo	Apep	Togo	Afad	Amed	Tany	Kala
White-crested Tiger Heron <i>Tigriornis leucolopha</i>	-	x	-	-	(x)	-	-	-	x
Spot-breasted Ibis <i>Bostrychia rara</i>	-	-	-	-	-	-	-	-	x
African Cuckoo Hawk <i>Aviceda cuculoides</i>	x	-	-	-	-	x	x	-	x
Congo Serpent Eagle <i>Dryotriorchis spectabilis</i>	-	x	-	-	-	x	-	-	x
African Harrier Hawk <i>Polyboroides typus</i>	x	x	x	x	x	x	x	x	x
Black Sparrowhawk <i>Accipiter melanoleucus</i>	-	x	-	-	-	x	x	-	x

Table 2 (contd).

	Chai	Kyab	Kabo	Apep	Togo	Afad	Amed	Tany	Kala
Red-thighed Sparrowhawk <i>Accipiter erythropus</i>	-	X	-	-	-	-	X	-	-
African Goshawk <i>A. tachiro</i>	X	X	X	X	X	X	X	X	X
Cassin's Hawk Eagle <i>Spizaetus africanus</i>	X	X	X	X	X	X	X	-	-
Ayres's Hawk Eagle <i>Hieraetus ayresii</i>	-	X	-	-	-	-	-	-	-
Latham's Forest Francolin <i>Francolinus lathamii</i>	-	(X)	-	-	(X)	-	-	-	-
Ahanta Francolin <i>F. achantensis</i>	X	X	X	X	X	X	X	X	X
Crested Guineafowl <i>Guttera pucherani</i>	-	X	-	(X)	-	-	-	-	-
Nkulengu Rail <i>Himantornis haematopus</i>	-	X	X	X	X	X	X	X	X
White-spotted Flufftail <i>Sarothrura pulchra</i>	X	X	X	X	X	X	X	X	X
Buff-spotted Flufftail <i>S. elegans</i>	-	X	-	X	-	-	X	-	-
African Finfoot <i>Podica senegalensis</i>	-	X	-	X	-	X	-	-	X
Western Bronze-naped Pigeon <i>Columba iriditorques</i>	-	X	X	X	X	X	X	-	-
Blue-headed Wood Dove <i>Turtur brehmeri</i> ¹	-	X	-	-	-	-	X	-	-
Tambourine Dove <i>T. tympanistreria</i>	-	X	X	X	X	X	X	X	X
African Green Pigeon <i>Treron calvus</i>	X	X	X	X	X	X	X	X	X
Green Turaco <i>Tauraco persa</i>	X	X	X	X	X	X	X	X	X
Great Blue Turaco <i>Corythaeola cristata</i>	-	(X)	-	-	(X)	-	-	-	V
Levaillant's Cuckoo <i>Clamator levaillantii</i> ²	-	X	X	X	-	-	-	-	-
Thick-billed Cuckoo <i>Pachycoccyx audeberti</i>	-	X	X	X	-	X	X	-	X
Black Cuckoo <i>Cuculus clamosus</i>	X	X	X	X	X	X	X	-	X
Red-chested Cuckoo <i>C. solitarius</i>	X	X	X	-	X	X	X	-	X
African Emerald Cuckoo <i>Chrysococcyx cupreus</i>	-	X	X	X	X	X	X	X	X
Yellow-throated Cuckoo <i>C. flavigularis</i> ³	-	-	-	-	-	-	X	-	X
Klaas's Cuckoo <i>C. klaas</i>	X	X	X	X	X	X	X	X	X
Olive Long-tailed Cuckoo <i>Cercococcyx olivinus</i>	-	X	X	-	-	-	-	-	-
Yellowbill <i>Ceuthmochares aereus</i>	X	X	X	X	X	X	X	X	X
Black-throated Coucal <i>Centropus leucogaster</i>	X	X	X	X	X	X	X	X	X
Fraser's Eagle Owl <i>Bubo poensis</i>	-	X	-	-	(X)	X	-	-	-
African Barred Owllet <i>Glaucidium capense</i>	X	X	X	X	X	X	X	-	X
African Wood Owl <i>Strix woodfordii</i>	X	X	X	X	X	X	X	X	X
Narina's Trogon <i>Apaloderma narina</i>	-	X	-	X	X	X	X	-	X
Shining-blue Kingfisher <i>Alcedo quadribrachys</i>	-	-	X	X	-	-	-	-	-
White-bellied Kingfisher <i>A. leucogaster</i>	-	-	-	-	X	-	-	-	X
Blue-breasted Kingfisher <i>Halcyon malimbica</i>	X	X	X	X	X	X	X	X	X
Black Bee-eater <i>Merops gularis</i>	-	-	-	-	-	-	X	-	-
Rosy Bee-eater <i>M. malimbicus</i>	-	-	-	-	-	-	X	-	X
Blue-throated Roller <i>Eurystomus gularis</i>	X	X	X	X	X	X	X	-	X
Broad-billed Roller <i>E. glaucurus</i>	X	X	X	X	X	X	X	X	X
White-crested Hornbill <i>Tropicranus albocristatus</i>	-	X	X	X	X	X	X	-	X
African Pied Hornbill <i>Tockus fasciatus</i>	X	X	X	X	X	X	X	X	X
Piping Hornbill <i>Bycanistes fistulator</i>	X	X	X	X	X	X	-	-	V
Yellow-casqued Hornbill <i>Ceratogymna elata</i>	-	-	-	-	(X)	X	X	-	-
Naked-faced Barbet <i>Gymnobucco calvus</i>	-	-	X	X	X	X	X	-	-
Yellow-rumped Tinkerbird <i>Pogoniulus bilineatus</i>	X	X	X	X	X	X	X	X	X
Yellow-throated Tinkerbird <i>P. subsulphureus</i>	-	-	-	-	-	V	X	-	-
Speckled Tinkerbird <i>P. scolopaceus</i>	X	X	X	X	X	X	X	X	X
Hairy-breasted Barbet <i>Tricholaema hirsuta</i>	-	X	X	X	X	X	X	-	X
Yellow-billed Barbet <i>Trachylaemus purpuratus</i>	-	X	X	X	X	X	X	-	X
Cassin's Honeybird <i>Prodotiscus insignis</i>	-	?	-	-	-	-	X	-	X
Spotted Honeyguide <i>Indicator maculatus</i>	-	X	X	-	X	-	X	-	X

Table 2 (contd).

	Chai	Kyab	Kabo	Apep	Togo	Afad	Amed	Tany	Kala
Lesser Honeyguide <i>Indicator minor</i>	-	X	X	X	X	X	X	-	X
Least Honeyguide <i>I. exilis</i>	-	X	-	-	-	-	X	-	X
Willcocks's Honeyguide <i>I. willcocksii</i>	-	X	-	-	-	X	X	-	-
Green-backed Woodpecker <i>Campethera cailliautii</i>	-	X	X	X	-	X	-	-	-
Buff-spotted Woodpecker <i>C. nivosa</i>	-	X	X	X	X	X	X	X	X
Gabon Woodpecker <i>Dendropicos gabonensis</i>	-	X	X	X	X	X	X	-	-
Fire-bellied Woodpecker <i>Thripias pyrrhogaster</i>	-	X	X	X	X	X	X	-	-
Rufous-sided Broadbill <i>Smithornis rufolateralis</i>	-	X	-	-	-	X	-	-	-
African Pitta <i>Pitta angolensis</i>	-	-	-	-	-	-	-	-	X
Purple-throated Cuckoo-shrike <i>Campephaga quiscalina</i>	-	X	X	X	X	X	X	X	X
Little Greenbul <i>Andropadus virens</i>	X	X	X	X	X	X	X	X	X
Little Grey Greenbul <i>A. gracilis</i>	-	X	X	X	X	X	X	-	X
Cameroon Sombre Greenbul <i>A. curvirostris</i>	-	X	X	X	X	X	X	X	X
Slender-billed Greenbul <i>A. gracilirostris</i>	X	X	X	X	X	X	X	X	X
Yellow-whiskered Greenbul <i>A. latirostris</i>	X	X	X	X	X	X	X	-	X
Honeyguide Greenbul <i>Baeopogon indicator</i>	X	X	X	X	X	X	X	X	X
Simple Leaflove <i>Chlorocichla simplex</i>	-	X	X	X	X	X	X	X	X
Swamp Palm Bulbul <i>Thescelocichla leucopleura</i>	-	X	X	X	X	X	X	-	X
Leaflove <i>Pyrrhurus scandens</i>	X	X	X	X	X	X	X	X	X
Baumann's Greenbul <i>Phyllastrephus baumanni</i>	X	X	X	X	X	X	X	X	X
White-throated Greenbul <i>P. albigularis</i>	-	X	X	X	X	X	X	X	X
Icterine Greenbul <i>P. icterinus</i>	-	V	-	-	-	-	-	-	V
Grey-headed Bristlebill <i>Bleda canicapillus</i>	X	X	X	X	X	X	X	X	X
Red-tailed Greenbul <i>Criniger calurus</i>	-	X	X	X	X	X	X	-	-
Western Bearded Greenbul <i>C. barbatus</i>	-	-	-	-	X	X	X	-	-
Common Bulbul <i>Pycnonotus barbatus</i>	X	X	X	X	X	X	X	X	X
Western Nicator <i>Nicator chloris</i>	X	X	X	X	X	X	X	X	X
White-tailed Ant Thrush <i>Neocossyphus poensis</i>	-	-	-	-	-	-	X	-	-
Finsch's Flycatcher Thrush <i>Stizorhina fraseri (finschi)</i>	-	X	X	X	X	X	X	-	-
Fire-crested Alethe <i>Alethe diademata</i>	-	X	X	-	X	X	X	-	X
Blue-shouldered Robin Chat <i>Cossypha cyanocampter</i>	-	X	X	X	X	X	X	-	X
Forest Robin <i>Stiphornis erythrothorax</i>	-	X	X	X	X	X	X	-	X
Forest Scrub Robin <i>Erythropygia leucosticta</i> ⁴	-	-	-	-	-	-	X	-	-
Green Crombec <i>Sylvietta virens</i>	X	X	X	X	X	X	X	X	X
Grey Longbill <i>Macrosphenus concolor</i>	-	X	X	X	X	X	X	-	X
Kemp's Longbill <i>M. kempii</i>	-	-	X	X	X	X	X	X	X
Rufous-crowned Eremomela <i>Eremomela badiceps</i>	-	-	X	X	X	X	-	-	-
Violet-backed Hyliota <i>Hyliota violacea</i> ⁵	-	-	-	-	-	-	X	-	-
Green Hylia <i>Hylia prasina</i>	X	X	X	X	X	X	X	X	X
Sharpe's Apalis <i>Apalis sharpii</i>	-	X	X	X	X	X	X	-	-
Grey-backed Camaroptera <i>Camaroptera brachyura</i>	X	X	X	X	X	X	X	X	X
Olive-green Camaroptera <i>C. chloronota</i>	-	X	X	X	X	X	X	X	X
Yellow-browed Camaroptera <i>C. superciliaris</i>	-	X	X	X	X	X	X	X	X
Fraser's Forest Flycatcher <i>Fraseria ocreata</i> ⁶	-	X	-	-	-	X?	-	-	-
White-browed Forest Flycatcher <i>F. cinerascens</i>	-	X	-	-	-	-	-	-	-
Ashy Flycatcher <i>Muscicapa caerulescens</i>	X	X	-	-	-	X	X	X	-

Table 2 (contd).

	Chai	Kyab	Kabo	Apep	Togo	Afad	Amed	Tany	Kala
Dusky-blue Flycatcher <i>Muscicapa comitata</i>	-	-	-	-	-	X	-	-	-
Shrike-flycatcher <i>Megabyas flammulatus</i>	X	X	X	X	X	X	X	-	X
Black-and-white Flycatcher <i>Bias musicus</i>	-	X	X	X	X	X	X	X	X
Red-cheeked Wattle-eye <i>Dyaphorophya blissetti</i>	-	X	X	X	X	X	X	X	X
Chestnut Wattle-eye <i>D. castanea</i>	-	X	-	-	X	X	X	-	X
Blue-headed Cr. Flycatcher <i>Trochocercus nitens</i>	-	X	-	-	-	X	X	-	X
Red-bellied Paradise Flycatcher									
<i>Terpsiphone rufiventer</i>	-	-	X	X	X	X	X	X	X
Brown Illadopsis <i>Illadopsis fulvescens</i>	X	X	X	X	X	X	X	X	X
Puvel's Illadopsis <i>I. puveli</i>	X	X	X	X	X	X	X	X	X
Capuchin Babbler <i>Phyllanthus atripennis</i>	-	X	X	X	-	-	-	-	X
Tit-hylia <i>Pholidornis rushiae</i>	-	-	-	-	-	-	X	-	-
Fraser's Sunbird <i>Deleornis fraseri</i>	-	v	-	-	-	-	-	-	v
Collared Sunbird <i>Anthreptes collaris</i>	X	X	X	X	X	X	X	X	X
Green Sunbird <i>A. rectirostris</i>	-	X	-	-	-	X	-	-	-
Little Green Sunbird <i>Nectarinia seimundi</i>	X	X	X	X	X	X	X	-	X
Olive Sunbird <i>N. olivacea</i>	X	X	X	X	X	X	X	X	X
Blue-throated Brown Sunbird <i>N. cyanolaema</i>	-	-	-	-	-	-	X	-	-
Buff-throated Sunbird <i>N. adelberti</i>	X	X	X	X	X	X	X	-	X
Olive-bellied Sunbird <i>N. chloropygia</i>	-	X	-	X	X	X	X	X	X
Tiny Sunbird <i>N. minulla</i>	-	-	-	-	-	X	X	-	-
Superb Sunbird <i>N. superba</i>	X	X	X	X	X	X	X	X	X
Western Black-headed Oriole									
<i>Oriolus brachyrhynchus</i>	-	-	-	-	-	-	X	-	-
Black-winged Oriole <i>O. nigripennis</i>	X	X	X	X	X	X	X	X	-
Sooty Boubou <i>Laniarius leucorhynchus</i>	-	-	X	-	X	-	X	-	-
Fiery-breasted Bush-shrike <i>Malaconotus cruentus</i>	-	X	X	X	X	X	X	-	-
Many-coloured Bush-shrike <i>M. multicolor</i>	-	X	X	X	X	X	X	-	-
Red-billed Helmet-shrike <i>Prionops caniceps</i>	-	X	X	X	X	X	X	-	X
Square-tailed Drongo <i>Dicrurus ludwigii</i>	-	X	X	X	X	X	X	-	-
Velvet-mantled Drongo <i>D. modestus</i>	-	-	-	X	X	X	-	-	-
Splendid Glossy Starling <i>Lamprotornis splendidus</i>	X	X	X	X	X	X	X	X	X
Yellow-mantled Weaver <i>Ploceus tricolor</i>	-	-	X	-	X	X	X	-	-
Blue-billed Malimbe <i>Malimbus nitens</i>	-	X	X	X	X	X	X	-	X
Crested Malimbe <i>M. malimbicus</i>	-	-	-	X	X	X	X	X	-
Red-headed Malimbe <i>M. rubricollis</i>	-	-	X	X	X	X	X	X	-
Red-vented Malimbe <i>M. scutatus</i> ⁷	-	-	-	-	-	X?	-	-	-
Grey-headed Negrofinch <i>Nigrita canicapillus</i>	X	X	X	X	X	X	X	X	X
Pale-fronted Negrofinch <i>N. luteifrons</i> ⁸	-	X	-	-	X	-	X	-	-
Chestnut-breasted Negrofinch <i>N. bicolor</i>	-	X	X	X	X	X	X	X	-
White-breasted Negrofinch <i>N. fusconotus</i> ⁹	-	X	-	-	-	X	X	-	-
Western Bluebill <i>Spermophaga haematina</i>	-	X	X	X	X	X	X	X	X

Notes.

¹The Amedzofe record is based on a specimen obtained by Baumann in 1894 (Reichenow 1897).

²*Clamator levaillantii* has been included only when calling loudly in forest, and thus apparently a local territorial bird (as opposed to migrants from the savanna zone).

³The record from the Ho square is a specimen collected by Baumann at Liati (= Liati Datem), not far from the Togo border (Cheke & Walsh 1996).

⁴The record comes from Morrison (in Grimes 1987).

⁵One sight record by Macdonald & Taylor (1977) from Amedzofe, overlooked by Grimes (1987).

⁶The record from Afadjato is from Ntiamao-Baidu *et al.* (2001) as well as from a local list. But in view of several errors in this work, we consider it probable but unconfirmed.

⁷A single record (from Wli Falls) by D. Moyer, but see text above.

⁸The record from Amedzofe is by Macdonald (1980).

⁹The record from Amedzofe is by Grimes (1987).

Biogeographical comments. The great majority of species in this list are also to be found in the wetter forests of the Guineo-Congolian region, as in south-west Ghana. But a few characteristic birds are absent from such forests, being frequent instead in the forest/savanna transition zone: African Barred Owlet, Leaflove and Square-tailed Drongo fall into this category. In south-west Ghana Square-tailed Drongo is replaced by Shining Drongo *Dicrurus atripennis*, and African Barred Owlet by Red-chested Owlet *Glauucidium tephronotum*.

Several species, most of which are very common or at least locally common in eastern Ghana, are present only at the periphery of the wetter forest region, in secondary situations such as thickets in farm-bush: Green Turaco, Yellow-rumped Tinkerbird, Baumann's Greenbul, Blue-shouldered Robin Chat, Puvel's Illadopsis, Capuchin Babbler and Red-cheeked Wattle-eye. A few, like Cassin's Hawk Eagle and Shrike-flycatcher, are present in the forests of south-west Ghana but are noticeably more common in the forested hills of the east.

Of the Upper Guinea endemics, i.e. Guineo-Congolian species that do not reach Nigeria, only one reaches eastern Ghana, Sharpe's Apalis, close to its limit of distribution in adjacent western Togo.

In general, the forest avifauna of the Volta Region is impoverished compared to that of the south-west, and notable absentees include Long-tailed Hawk *Urotriorchis macrourus*, Afep Pigeon *Columba unicincta*, all parrots, Yellow-billed Turaco *Tauraco macrorhynchus*, Akun Eagle Owl *Bubo leucostictus*, all forest spinetails and Bates's Swift *Apus batesi*, Brown Nightjar *Caprimulgus binotatus*, both forest wood hoopoes, several hornbills, two barbets (Red-rumped Tinkerbird *Pogoniulus atroflavus* and Yellow-spotted Barbet *Buccanodon duchaillui*), Yellow-footed Honeyguide *Melignomon eisentrauti*, Brown-eared Woodpecker *Campethera caroli*, Square-tailed Saw-wing *Psalidoprocne nitens*, Blue Cuckoo-shrike *Coracina azurea*, several bulbuls (including Spotted *Ixonotus guttatus* and Ansorge's Greenbul *Andropadus ansorgei*, Red-tailed *Bleda syndactylus* and Green-tailed Bristlebills *B. eximius*), Brown-chested Alethe *Alethe poliocephala*, Lemon-bellied Crombec *Sylvietta denti*, Black-capped Apalis *Apalis nigriceps* (one record by Grimes from Amedzofe is perhaps best left in need of confirmation, we never found it in several visits, including with the use of tape playback), several flycatchers (Ussher's *Muscicapa ussheri*, Olivaceous *M. olivascens*, Tessmann's *M. tessmanni*, Cassin's *M. cassini* and Grey-throated Flycatchers *Myioparus griseigularis*, and Bioko Batis *Batis poensis*), three illadopsis (Blackcap *Illadopsis cleaveri*, Pale-breasted *I. rufipennis* and Rufous-winged *I. rufescens*), Dusky Tit *Parus funereus*, Johanna's Sunbird *Nectarinia johanna*, Sabine's Puffback *Dryoscopus sabini*, Shining Drongo, three starlings (including Copper-tailed Glossy *Lamprotornis cupreocauda*), Maxwell's *Ploceus albinucha* and Preuss's Weavers *P. preussi*, and Red-fronted Antpecker *Parmoptila rubrifrons*.

Crowned Eagle *Stephanoaetus coronatus* is not recorded from eastern Ghana today, but it did occur on the Togo side until recently, although it is not certain that it has survived in Assoukoko forest. Similarly, we were unable to find the following, which do occur in the more extensive highlands of western Togo: Dusky Long-tailed Cuckoo *Cercococcyx mechowi* (still observed in Assoukoko forest and near Bénali in 2011), Bristle-nosed Barbet *Gymnobucco peli* (known from specimens on the Togo side, albeit much rarer than *G. calvus*), Little Grey Flycatcher *Muscicapa epulata* (rare, but we had one record in 2011 just east of the Ghana border at Kpété Béna) and Forest Chestnut-winged Starling *Onychognathus fulgidus* (rare, but we saw it twice in 2011, north to Assoukoko). In Dowsett-Lemaire & Dowsett (2011b) we list some other species reported by Cheke & Walsh (1996) for which we have doubts, including Shining Drongo apparently confused by them with Velvet-mantled Drongo.

Further work into the region carried out in 2010-11 showed the need to take into account problems

of seasonality of calling. March–April is an active period for some groups such as bulbuls, warblers, flycatchers, illadopsis and sunbirds, but Forest Robins and robin chats were not singing much, some cuckoos were hardly calling (e.g. Red-chested), Narina's Trogon was also barely calling and doves were found to be rather silent — which may explain partly why we have so few records of Blue-headed Wood Dove. In high-rainfall areas such as Kyabobo, the peak of the rains (July) was found to be less productive than the month of February; nevertheless it is in October that Moyer heard the Olive Long-tailed Cuckoo south of Kyabobo. Our visits in the rains, especially in October 2010, located some very noisy Sooty Boubous at Amedzofe (and also Odomi) which had been overlooked on previous visits. Similarly, all Turdidae were very vocal, including White-tailed Ant Thrush alarm-calling in full view. Our visits to western Togo in late March and early May were very productive, including for all cuckoos, but steady rains started in March in As-soukoko forest (considered as being unusually early by the local farmers), and were also regular by May on the Danyi Plateau. The region of Afadjato and Amedzofe seen immediately afterwards in May 2011 proved to be much drier than the Togo side: for instance Black Cuckoos were extremely noisy on the Danyi Plateau but much quieter at Amedzofe (only one heard).

Identification problems were encountered with two superspecies: *Malaconotus cruentus/lagdeni* and *Dicrurus adsimilis/modestus*. Lagden's Bush-shrike was identified initially in Kyabobo N.P., based on a bird seen once in forest understorey, with yellow underparts and showing (apparently) spots on the wing-coverts (FDL). Further surveys in eastern Ghana, however, have shown Fiery-breasted Bush-shrike to be very widespread in similar habitat. Moreover, the longer whistles of Lagden's were never heard east of the Volta.

Fork-tailed Drongo *sensu lato* was never seen inside forest and on initial surveys was assumed to be the ordinary savanna drongo, adapted to farmbush. The strong possibility, however, that we are dealing with the forest form Velvet-mantled Drongo *D. modestus* instead of the savanna form *adsimilis* has to be borne in mind for some areas. On the Togo side very close to the border, three specimens of (apparently) the forest form *atactus* (now included in *D. modestus*) were collected in and around Klouto/Misahöhe by Baumann, and these are still in the Berlin collections seen by RJD in 2011. There is also a specimen from Ahenkro in Ghana (collected by Baumann in 1894), which is in the south-west corner of present-day Togo Plateau F.R. In four areas of eastern Ghana (within three Atlas squares), Fork-tailed Drongos *sensu lato* have been seen in farmbush or at forest edges away from any true savanna: Tolome, Odomi River F.R., Likpe Todome, and foothill of Afadjato (pair seen on each visit below the mountain near the tourist centre). In two places (Likpe Todome and Tolome) Square-tailed Drongos were nearby in riparian forest, and the "Fork-tailed" outside in tall trees in farmbush. In at least two squares on the Togo border (from Tolome south to Afadjato), there is hardly any edaphic woodland, and the fragments that exist are too small even to have Senegal Batis *Batis senegalensis* or Green-backed Eremomela *E. pusilla*, and we have not observed any drongo in those very small patches.

Similarly in western Togo, "Fork-tailed Drongos" were never found inside forest, where Square-tailed Drongo is very common. If indeed these birds are *D. modestus* their ecology differs from that in south-west Ghana (and elsewhere in the Guineo-Congolian region) where they are common not just in farmbush but especially in the upper levels of rain forest, leaving shaded or sheltered understorey to another congener, the Shining Drongo. It is almost impossible to identify the form in the field, and observers generally rely on ecology, and sometimes voice. In south-west Ghana, Velvet-mantled Drongos have some distinctive dusk or dawn calls, that appear to differ from those of the savanna birds found just outside the forest zone. In eastern Ghana and western Togo, however, voice does not help, as we have heard exactly the same motifs in western Togo (Kpété Béna, in cocoa farmbush) and (for instance) woodland in Kalakpa.

The distribution of "Fork-tailed" Drongo *sensu lato* in the forested highlands of western Togo is very limited: it is absent from north of 7°30'N, appearing suddenly at the level of Tomegbé south to at least Kpété Béna (in farmbush), and it is common in the Klouto area above Kpalimé, where it occupies farmbush, wooded grassland (mainly with forest trees) and gardens. On the Ghana side Fork-tailed Drongos are much more widespread, but many of those must be *D. adsimilis*. For instance what we consider to be savanna *adsimilis* occur in natural woodland all around Ho, in transition or ordinary woodland in the west of Kabo River F.R., and in degraded woodland to the west of Togo Plateau F.R. Woodland becomes dom-

inant at the level of Tutukpene and occurs widely in Kyabobo N.P., where again Fork-tailed Drongos are widespread. Whether any *modestus* is mixed up with *adsimilis* in areas where woodland comes close to forest is impossible to ascertain. Could hybridization take place, especially as voice should not act as a barrier?

4. CONSERVATION ISSUES

Overall, the conservation status of the forests of Volta Region is not good, outside Kalakpa Resource Reserve and Kyabobo National Park. There are still vast expanses of dry *Anogeissus* forest or transition woodland on hillsides, or dry forest with thickets, in forest reserves such as Togo Plateau or Chai River (and probably Asuokoko), but the richer forest in the valley bottoms is being cleared everywhere for cultivation. In Kabo River and the foothills of Apepesu most of the natural forest has been replaced by Teak plantations. Faunistically, these sheltered groves are the richest and most at risk of losing species. Forests around Amedzofe receive no official or other protection, yet localized species of moister forest such as Western Bearded Greenbul or Fire-crested (White-tailed) Alethe depend on forested streams for their survival.

Community conservation projects such as those at Afadjato are worth supporting, but there is a lack of coordination between farmers on the one hand, and those members of the communities who wish to develop ecotourism and protection (see under Dagbo Falls). As for Wli Falls, we gather that the massacre of Straw-coloured Fruit Bats *Eidolon helvum* that we denounced in our 2005 report is continuing, to the detriment not just of the bats but of the local communities who are losing visitors. For this and other reasons the Wildlife Division has given up its involvement there (Manager George Asamoah pers. comm. in 2010).

In addition several mammal and large bird species are threatened by hunting, such as Black-and-white Colobus, Crested Guinea fowl, Great Blue Turaco and large hornbills. The Colobus is on the verge of extinction if not already extinct in most places. Yellow-casqued Hornbill (a Near Threatened species on the IUCN Red List) is in the same situation: we saw just one between Biakpa and Amedzofe and heard one near Afadjato in April 2008, and it has been reported to us by hunters from Togo Plateau, but numbers are very small and perhaps do not form a viable population. Great Blue Turaco has been reported by several hunters or wildlife guards from the region, but must remain very rare as we still have not come across it ourselves. Piping Hornbills, on the other hand, remain common in some forest reserves (especially Togo Plateau and Kabo River near Asukawkaw), and not just in Kyabobo N.P. Hunters at Togo Plateau F.R. (Aboabo village) were certain that Crested Guinea fowl did not exist in their area, and it is possible that it has been confined for some time to the hills on the Togo border around Kyabobo and Apepesu; it receives protection in Kyabobo and survives in Assoukoko forest on the Togo side. Other species not recorded on these surveys but which must have existed in the past include Crowned Eagle.

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APPENDIX. GAZETTEER OF MAIN FOREST LOCALITIES

Afadjato Mt	7°01'N, 0°34'E
Amedzofe.....	6°50'N, 0°26'E
Apepesu F.R. near Okrakrom	7°52'N, 0°34'E
Chai River F.R. at Tutukpene	8°06'N, 0°23'E
Dafo border crossing	6°58'N, 0°31'E
Dikpéléou (Togo border)	8°13'N, 0°37'E
Kabo River F.R. near Asukawkaw	7°40'N, 0°22'E
Kabo River F.R. at Okwe	7°33'N, 0°25'E
Kalakpa Resource Reserve (north)	6°27'-6°28'N, 0°20'-0°30'E
Kyabobo N.P.	8°20'-8°31'N, 0°34'-0°40'E
Likpe Todome	7°11'N, 0°36'E
Odomi River F.R. near Bodada	7°21'N, 0°29'E
Paradise Lodge near Biakpa	6°50'N, 0°24'E
Tanyigbe.....	6°42'N, 0°31'E
Togo Plateau F.R. at Aboabo	7°20'N, 0°24'E
Tolome	7°43'N, 0°36'E
Wawa river (Togo border)	7°43'N, 0°37'E
Wli Falls.....	7°06'N, 0°37'E