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Executive Summary

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Executive Summary

INTRODUCTION

Liberia lies entirely within the Upper Guinea forest region that stretches from Guinea to Togo and is part of the Guinean Forests of West Africa Hotspot, making it one of the 34 biologically richest and most endangered terrestrial ecoregions in the world (see map, Myers et al. 2000, Mittermeier et al. 2004). The remaining forests in this region contain exceptionally diverse ecological communities, distinctive flora and fauna, and a mosaic of forest types providing refuge to a number of endemic species (McCullough 2004).

At the Upper Guinean Forest Priority-Setting Workshop in 1999, Gola National Forest and Grebo National Forest were ranked as being 'exceptionally high' and North Lorma National Forest as 'very high' conservation priority areas (Bakarr et al. 2001). Since more than 40% of forest remaining in this hotspot is located in Liberia (Bakarr et al. 2004), the country is key to protecting what is left of the region's fragmented forests.

Historically, Liberia's 9.6 million hectares were completely forested; however, only 36% remains as intact closed forest (2.4 million hectares) or as open forest (1 million hectares) with evidence of recent logging (Bayol and Chevalier 2004). An additional 24% has been altered by agriculture of which nearly 10% is potentially suitable for sustainable forestry. The estimated annual deforestation rates of 1.6% between 1990-2000 and 1.8% between 2000–2005 are higher than that of the total Upper Guinea forest region (1.4% and 1.6%) (FAO 2005).

A large portion of Liberia's forest lies in two large blocks: the evergreen lowland forest in the southeast and the semi-deciduous montane forests in the northwest. Overall, little is known about the country's flora and fauna since few studies have been conducted here.

Liberia currently has two protected areas: Sapo National Park (created in 1983) located in the lowland rainforests of southeastern Liberia and East Nimba Nature Reserve (created in 2003) located in the highest elevations of northeastern Liberia. Prior to the civil war (1989-2003), Sapo National Park was well managed and destined to be the model for all of Liberia's future parks. However, the long war eroded infrastructure and restricted management. Since the end of the war, a concerted effort has been put forth to re-establish conservation, restore the current protected areas and promote sustainable forest management (Waitkuwait and Suter 2001, 2002; Whiteman 2004). In 2002, Conservation International (CI) signed a Memorandum of Understanding (MoU) with the Government of Liberia which proposed seven conservation areas to form the basis of a Liberian protected area network (Conservation International 2002). This would increase the area under protection from 0.2% to 10.6% (Bayol and Chevalier 2004). As Liberia emerges from 14 years of civil war, there will be tremendous pressure on the natural resources to develop the economy (ITTO 2006). A balance between the needs of Liberians and those of their region's imperiled flora and fauna will need to be achieved.

RAP EXPEDITION OVERVIEW AND OBJECTIVES

Conservation International's Rapid Assessment Program (RAP) was created in 1990 to rapidly provide biological information needed to catalyze conservation action and improve biodiversity

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protection. From November 19 to December 11, 2005, RAP collaborated with CI's Liberia field office and West Africa Program to carry out a biodiversity survey of three sites in Liberia: 1) North Lorma National Forest in the northwest, 2) Gola National Forest in the northwest, and 3) Grebo National Forest in the southeast. These areas still contain large blocks of contiguous low to medium elevation forest and it was deemed important to survey the biodiversity of these areas in order to make recommendations regarding their protection and management.

The RAP survey was part of the larger Liberia Forest Initiative (LFI) which supports efforts to rehabilitate and reform the forest sector in Liberia and harmonize activities associated with these efforts (Whiteman 2004). In addition to collecting data on the sites to strengthen and expand conservation efforts in Liberia, the RAP team worked to build scientific capacity within Liberia's Forestry Development Authority (FDA), the University of Liberia, and local NGOs. Efforts were also made to increase the general public's awareness of their rich flora and fauna.

A RAP team of 21 international and host-country biologists and forestry managers surveyed plants, dragonflies and damselflies, amphibians and reptiles, birds and mammals. International scientists from Belgium, Germany, the Netherlands, Sierra Leone and Swaziland and Liberians from the FDA, the University of Liberia and the Society for the Conservation of Nature in Liberia (SCNL) participated in the study.

RESULTS BY SITE

Coordinates were taken with a Garmin eTrex Venture GPS, map datum WGS 84. See Table 1 for a summary of the number of species recorded at each site.

North Lorma National Forest (19–24 November 2005)

Site 1: 08° 01' 53.6" N 09° 44' 08.6" W

In 1959 the Government of Liberia created the 71,226 hectare North Lorma National Forest (UNEP-WCMC 2006a). It consists of seasonal moist evergreen and semi-deciduous forest. It is situated in northwestern Lofa County near the border with Guinea and constitutes an important forest corridor between the Wologizi and the Wonegizi Mountains. These two mountain ranges, which include Liberia's highest peak, Mt. Wutewe (1424 m), form the most important montane region in Liberia apart from Mt. Nimba. Annual precipitation at North Lorma is approximately 2500 mm and the annual mean temperature is 24.9°C (Chapter 5). Threats to the area include agriculture and hunting (Sambolah 2005).

The camp at Site 1 was situated next to the Lawa River in an open riverine forest habitat. Many smaller streams were present within a slightly hilly landscape. Further from the river, at a higher elevation, the vegetation quickly changed to lower forest with large scattered trees. This site had the least amount of disturbance with the presence of an old overgrown logging road the only noticeable sign of previous human activity.

Significant findings:

- This was the richest site for plants with 266 plant species collected, of which 39 (15%) are endemic to Upper Guinea. One species, *Gardenia nitida,* is a new country record for Liberia. Many different vegetation types were found in close proximity to each other. Next to the Lawa River, species-rich wet forest quickly changed into dry forest and even into completely herbaceous vegetation uphill, whereas in lower areas it gradually changed into swamp forest. Although a logging road was discovered near the camp, logging did not appear to occur in the area.

- Species numbers of dragonflies and damselflies (Odonata) were relatively low due to the unfavorable season. However, the 58 species found are all representative of the Upper Guinean rainforest fauna. *Tetrathemis polleni* marked a new country record for Liberia.

- The recorded herpetofauna consisted of 18 amphibian species and six reptile species. One amphibian species is categorized as Endangered, one as Vulnerable and four as Near Threatened (IUCN 2006, Table 2). Most of these species were very abundant. One amphibian species and two reptile species are listed under CITES. Three amphibian species were new records for the country.

- At this site, 143 species of birds were recorded. Of these, eight are of global conservation concern with two species listed as Vulnerable, five as Near Threatened and one as Data Deficient (IUCN 2006, Table 2). Seven of the 15 restricted-range species (i.e. landbird species which have a global breeding range of less than 50,000 km^2) that make up the Upper Guinea forests Endemic Bird Area (the area from Sierra Leone and southeast Guinea to southwest Ghana that encompasses the overlapping breeding ranges of restricted-range species, Stattersfield et al. 1998) were found during the study. The reserve holds an important proportion of the Upper Guinea endemics and qualifies as an Important Bird Area (IBA, see Birdlife International 2006 for more on IBAs).

- Seven species of bats were found that are restricted to good forest habitat including *Hipposideros fuliginosus*, categorized by IUCN as Near Threatened. A large cave system sheltering over a thousand *Rousettus aegyptiacus* was also found near this site.

- Of the 21 large mammal species recorded, 11 (52%) appear on the IUCN Red List (Table 2). Primates were seen daily and eight species were observed, including the nests of West African Chimpanzees. This was also the only site where African Buffalo was seen.

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Gola National Forest (28 November – 4 December 2005)
Site 2: 07° 27' 09.9" N 010° 41'33.2" W
SLC Village: 07° 26' 56.3" N 010° 39' 05.0" W

Gola National Forest was established in 1960 and covers 202,000 hectares (UNEP-WCMC 2006a). It is a seasonal moist evergreen and semi-deciduous forest and is situated in Gborpolu County between the Gola Strict Nature Reserve in Sierra Leone and Kpelle National Forest in Liberia. Annual precipitation at Gola is approximately 2700 mm and the annual mean temperature is 25.4°C (Chapter 5). Threats to the area include logging, hunting and diamond mining (Sambolah 2005).

Two camps were established. The main camp, Site 2, was located within mainly primary forest. The landscape had steep slopes with small, rocky streams. The vegetation was dense in most areas and some huge lianas were present. After it was found that the terrain and closed canopy was hindering sampling efforts for some taxonomic groups, a second camp was established in a clearing at the SLC village. The clearing was once the site of a Spanish Liberia Company (SLC) sawmill, which is now completely destroyed. Illegal small-scale diamond mining was observed just inside the forest.

Significant findings:

- In total, 200 plant species were identified, of which 53 (27%) are endemic to Upper Guinea, including three species endemic to Liberia (*Cephaelis micheliae*, *Trichoscypha linderi* and *Sericanthe adamii*). A large liana, *Zanthoxylum psammophilum*, not previously recorded west of eastern Côte d'Ivoire, constitutes a new record for Liberia. A *Rhaphiostylis* species likely to be new to science was also discovered. Three saprophytic plant species without chlorophyll were found next to each other at one location. These are not commonly seen and even more rarely in such close proximity.

- Seventy species of Odonata were collected, of which five are Upper Guinean endemics. Two, *Sapho fumosa* and *Trithemis Africana*, are of conservation concern and have a preliminary assessment of Near Threatened. Four species are new country records for Liberia (*Paragomphus nigroviridis*, *Phyllogomphus moundi*, *Palpopleura deceptor* and *Trithemis monardi*).

- Thirty amphibians and nine reptiles were recorded, including one Endangered, two Vulnerable and six Near Threatened amphibian species. Two reptile species are listed under CITES (Table 2). Two of the amphibian species constituted new country records for Liberia. The diversity of amphibians and reptiles was higher at this site than at the other two, but included more non-forest species, possibly because of the clearing of forest for diamond mining.

- In total, 145 bird species were found including six Upper Guinea Forest endemics. The Gola Malimbe *Malimbe ballmanni*, categorized as Endangered, was seen on most days. One Vulnerable and four Near Threatened bird species were also noted (Table 2). This site qualifies as an Important Bird Area (IBA).

- A Vulnerable species of bat, *Rhinolophus hillorum*, with a restricted distribution and known from only a few specimens was found. Two additional species that were recorded, *Hypsugo* (*crassulus*) *bellieri* and *Neoromicia* aff. *grandidieri*, are restricted to West Africa, with the latter being a new record for Liberia, and possibly representing a species new to science. In total, 13 bat species and five terrestrial small mammals were noted, including the rarely reported Western Palm Squirrel *Epixerus ebii*.

- Of the 14 species of large mammals recorded, one is listed as Vulnerable and four as Lower Risk/Near Threatened (Table 2).

Grebo National Forest (7 – 11 December 2005)
Site 3: 05° 24' 10.4" N 007° 43' 56.2" W
Jalipo Village: 05° 22' 10.5" N 007° 46' 14.5" W

Grebo National Forest was created in 1960 and covers 260,326 hectares (UNEP-WCMC 2006a). It is a wet evergreen forest situated in the southeast of the country in River Gee County. It is contiguous with the Forêt Classée du Cavally and very close to Taï National Park, both in Côte d'Ivoire, but forest habitat is broken by a narrow strip of dense human settlement and farming on the Ivorian side next to the latter. Annual precipitation at Grebo is approximately 2500 mm and the annual mean temperature is 25.7°C (Chapter 5). Threats to the area include logging and hunting.

Two camps were again established to increase the sampling efforts for some taxonomic groups. The main camp, Site 3, was located in the forest along an old logging road, with a secondary camp at the forest edge in Jalipo Village. Site 3 was a former logging area left untouched for some twenty years and consisting of mainly open, mature secondary forest with isolated huge trees. Some medium-sized sandy streams with a few rocks occurred, as well as large ponds.

Significant findings:

- In total, 220 plant species were recorded, of which 37 (17%) are endemic to Upper Guinea, including a new country record for Liberia (*Elytraria ivorensis*). Two species, a *Drypetes* and a *Leptoderris* are likely to be new to science. The abundant presence of *Psychotria kwewonii* was interesting as it is a recently discovered species occurring in eastern Liberia and southwestern Côte d'Ivoire.

- Of the 63 Odonates collected two are Upper Guinean endemics. *Nesciothemis minor* is a new country record for Liberia.

- The herpetofauna diversity at this site was high, with 30 species of amphibians and six species of reptiles being identified. These consisted mainly of true forest species, with two Vulnerable, ten Near Threatened and possibly

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one Endangered species (Table 2). Two reptile species are listed under CITES.

- Ten of the 156 bird species recorded are of global conservation concern, with five Vulnerable and five Near Threatened species (Table 2). Nine bird species are Upper Guinea endemics. Additionally, a number of rare and poorly known species were observed including Spot-breasted Ibis *Bostrychia rara*, Congo Serpent Eagle *Urotriorchis spectabilis* and Blue-headed Bee-eater *Merops muelleri*. The site also qualifies as an Important Bird Area (IBA).

- All of the 12 bat species captured in Grebo prefer forested habitat, including *Scotonycteris zenkeri*, a Near Threatened species. *Neoromicia guineensis* is a new country record for Liberia. Five other small mammal species were noted including the scaly-tailed swirrel, *Anomalurus* cf. *pusillus*, which is the third record for West Africa.

- All but one of the 29 large mammal species recorded on the RAP survey were seen in Grebo. Primates were regularly noted including Olive Colobus (*Procolobus verus*) and West African Chimpanzee (*Pan troglodytes versus*). The Red River Hog (*Potamochoerus porcus*) was the only mammal recorded only from this site. Of the 28 large mammal species recorded 14 (50%) are of conservation concern (Table 2). Tracks of Leopard *Panthera pardus* (CITES Appendix I) were observed and large numbers of primates were seen and heard daily.

RESULTS BY TAXON

Plants

We recorded 548 plant species (Table 1) of which 101 (18%) are endemic to the Upper Guinea forest area (Upper Guinea sensu White 1983). The sites in North Lorma and Gola are considered to be healthy mature forest and showed only limited disturbance by human activity that does not, at present, constitute a threat to the vegetation. Grebo was logged about 20 years ago and is now in the process of regeneration and recovering well. We found three plant species endemic to Liberia, *Cephaelis micheliae, Sericanthe adamii* and *Trichoscypha linderi*, and three plant species that were recorded for the first time in the country, *Elytraria ivorensis*, *Gardenia nitida* and *Zanthoxylum psammophilum*. We also found three plant species likely to be new to science, *Drypetes* sp., *Leptoderris* sp. and *Rhaphiostylis* sp.

Dragonflies and damselflies

We recorded 93 species of dragonflies and damselflies (Table 1). Seven species were recorded in Liberia for the first time. Numbers of species and individuals seemed low, probably because the survey was at the end of the wet season, rather than towards the start. The results nonetheless indicate a healthy watershed in each forest, with limited pollution and streambed erosion. If forest cover and natural stream morphology are retained, the present dragonfly faunas are expected to persist. The most interesting species assemblage was recorded in Gola, including two species of conservation concern (Table 2).

Amphibians and Reptiles

We recorded at least 40 amphibian and 17 reptile species (Table 1). Fifteen amphibians are on the IUCN Red List: two are classified as Endangered, two as Vulnerable, and 11 as Near Threatened (Table 2). We found five species that had not been recorded in Liberia before. For several species records represent large range extensions. Five of the reptile species recorded and one amphibian species are listed under CITES (Table 2). All three forests have a high conservation value as their herpetofauna mainly consists of forest specialists which are endemic to the Upper Guinea forest block.

Table 1. Number of species documented during the RAP survey in the North Lorma, Gola and Grebo National Forests, Liberia.

	All RAP sites in this survey	North Lorma	Gola	Grebo
Plants	548	266	200	220
Dragonflies and damselflies	93	58	70	63
Amphibians	40	18	30	30
Reptiles	17	6	9	6
Birds	211	143	145	156
Bats	22	7	13	12
Small Mammals	9	7	5	5
Large Mammals	29	21	14	28
Total	**969**	**526**	**486**	**520**

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Birds

We recorded 211 bird species: 143 at North Lorma, 145 at Gola, and 156 at Grebo (Table 1). Of these, 14 are of conservation concern (eight in North Lorma, six in Gola and 10 in Grebo), amongst which one is classified as Endangered (Gola Malimbe *Malimbus ballmanni*), six as Vulnerable, six as Near Threatened and one as Data Deficient (Table 2). Twelve of the 15 species restricted to the Upper Guinea forests Endemic Bird Area and 136 (or 74%) of the 184 Guinea-Congo forests biome species recorded in Liberia were found during the study. Range extensions or new localities were noted for several species. All three sites qualify as Important Bird Areas (IBA).

Bats and terrestrial small mammals

A total of 182 bats of 22 species were captured (Table 1), representing 37% of the bat species known to occur in Liberia. Species richness was highest at Gola and Grebo, possibly because secondary forest and forest edge was sampled there. North Lorma, where only forest interior was surveyed, had both the lowest capture success and the lowest species richness. Three IUCN Red List species were recorded (Table 2). Bat assemblages in each of the surveyed areas were characterized by forest-dependent species. Not a single species typical of savanna habitats was recorded, indicating high habitat integrity of the National Forests. Three bat species are reported for the first time from Liberia (*Rhinolophus landeri*, *Neoromicia guineensis* and *Neoromicia* aff. *grandidieri*), raising the bat species total for the country to 59. Two species of shrews, one murid rodent, five squirrels and one anomalure (scaly-tailed squirrel) were also recorded, including the rarely reported Western Palm Squirrel *Epixerus ebii* and the Lesser Anomalure *Anomalurus* cf. *pusillus*.

Large mammals

We recorded 29 mammal species including nine primates: 21 in North Lorma, 14 in Gola and 28 in Grebo National Forest (Table 1). Four are listed by the IUCN Red List as Endangered, one as Vulnerable, one as Lower Risk/Conservation Dependant, and nine as Lower Risk/Near Threatened (Table 2). The CITES-listed Leopard *Panthera pardus* was also recorded.

CONSERVATION RECOMMENDATIONS

North Lorma, Gola and Grebo National Forests all contain a wealth of biodiversity and a significant number of species of conservation concern (Table 2). Among the fragmented forests of the Upper Guinea hotspot, Liberia has a great potential for conserving large tracts of contiguous forest that house this flora and fauna. In total, 60 species of conservation concern, as categorized by the IUCN Red List and CITES, were recorded in these forests, a considerably large number. Efforts should be taken to monitor and protect all these species.

Species listed on the IUCN Red List are categorized based on the degree to which they are globally threatened. The data used in the evaluations is objective, based in science and peer reviewed. Categories, from less threatened to most threatened, include: Data Deficient (DD, not enough is known to make an assessment), Least Concern (LC, listed but not threatened), Near Threatened (NT), Vulnerable (VU), Endangered (EN) and Critically Endangered (CR) (IUCN 2006). For species that have not been evaluated since 2001 some categories are slightly different with the category Lower Risk (LR) including Least Concern (lc), Near Threatened (nt) and Conservation Dependent (cd) (IUCN 2006). Species listed by CITES are categorized by how international trade in these species would affect their survival. The Convention provides various levels of trade restrictions based on the Appendix the species is listed under. Appendices from the least restrictive trade to the most restrictive trade include: Appendix III (species not threatened with global extinction), Appendix II (not threatened with extinction but could be if trade is not strictly controlled) and Appendix I (most endangered species, threatened with extinction).

Conservation Priorities

- Raise the status of Grebo National Forest to National Park. Despite human disturbance, 40 animal species of conservation concern were recorded here, the highest number of all three sites visited (Table 2). Many of the bird and amphibian species recorded here have restricted ranges. With nine primate species occurring, primate species diversity at least equals that of nearby Sapo National Park (Waitkuwait 2001). Grebo's close proximity to both Taï National Park in Côte d'Ivoire and Sapo National Park offers an opportunity to create a biological corridor between the two parks. This biological corridor could not only safeguard biodiversity but would also preserve the extensive forest cover that is essential to perpetuate the moist air carried by the southwest monsoon further inland.

- Raise the status of North Lorma National Forest to National Park. In total, RAP scientists found 30 amphibian, reptile, bird and mammal species of conservation concern (Table 2). The variety of habitats and the limited amount of disturbance from human activity make this an area that should be closely monitored so that these habitats remain intact. It is suggested that Wonegizi and Wologizi Mts. also be included within the park and that the area should be contiguous to the Biosphere Reserve of the Massif du Ziama in Guinea. This would constitute one of the most significant protected areas of submontane rainforest in West Africa (for a detailed discussion of the importance of the Massif du Ziama, see Fahr et al. 2006). This mountainous region contains suitable habitat for several cave-roosting bats, many of which have small distribution ranges and are globally threatened.

- Raise the status of Gola National Forest to National Park. At this site RAP scientists recorded 27 animal

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species of conservation concern (Table 2). Of the three sites surveyed, Gola National Forest contained the highest number of threatened species for bats (three) and odonates (two) and was second highest for amphibians (nine). This site had the highest number (80) of recorded species that are endemic to the Upper Guinea forests. A transboundary biological corridor with the Gola Forest in Sierra Leone could be created allowing migratory animals, such as Forest Elephant, to move between the two countries. Biological surveys should also be conducted at nearby Kpelle National Forest to examine the feasibility of extending the corridor.

- All three sites surveyed qualify as Important Bird Areas (IBAs), which further indicates their importance for biodiversity conservation. IBAs are globally recognized sites for conservation, small enough to be conserved in their entirety and often already part of a protected-area network (BirdLife International 2006). IBAs are designated based on one (or more) of three criteria: 1) Holding significant numbers of one or more globally threatened bird species, 2) Being one of a set of sites that together hold a suite of restricted-range bird species or biome-restricted bird species, and 3) Having exceptionally large numbers of migratory or congregatory bird species (BirdLife International 2006).

General Conservation Recommendations

- Create a mechanism within which all potential protected areas, especially Grebo, North Lorma and Gola National Forests, can be given blanket protective coverage to allow time for gradual biological, socio-economic and other relevant studies to occur. The economic pressures on the natural resources of Liberia are immense and were seen in Gola National Forest where small-scale diamond mining and large scale prospecting are occurring. Many of the species that were recorded during this survey depend on healthy intact forests and if these areas are degraded prior to obtaining protection their survival here could be impacted.

- Involve all stakeholders, especially local communities, at an early stage in an open, transparent manner when establishing forest management plans for these sites.

Table 2. Animal species of conservation concern recorded during the RAP survey (IUCN 2006, UNEP-WCMC 2006).

Taxon	Species Name	Common Name	Conservation Status*	RAP Survey Site		
				North Lorma	Gola	Grebo
Amphibian	*Amnirana occidentalis*	Ivory Coast Frog	EN		x	
Amphibian	*Phrynobatrachus annulatus*		EN	x		
Amphibian	*Phrynobatrachus* cf. *annulatus*		EN	x		
Bird	*Malimbus ballmanni*	Gola Malimbe	EN		x	
Large Mammal	*Hexaprotodon liberiensis*	Pygmy Hippopotamus	EN			x
Primate	*Cercopithecus diana*	Diana Monkey	EN	x		x
Primate	*Pan troglodytes verus*	West African Chimpanzee	EN	x		x
Primate	*Piliocolobus badius*	Western Red Colobus	EN	x		x
Amphibian	*Conraua alleni*	Allen's Slippery Frog	VU		x	x
Amphibian	*Phrynobatrachus villiersi*		VU	x	x	x
Bird	*Agelastes meleagrides*	White-breasted Guineafowl	VU			x
Bird	*Bleda eximius*	Green-tailed Bristlebill	VU			x
Bird	*Criniger olivaceus*	Yellow-bearded Greenbul	VU	x	x	x
Bird	*Lobotos lobatus*	Western Wattled Cuckoo-shrike	VU			x
Bird	*Melaenornis annamarulae*	Nimba Flycatcher	VU			x
Bird	*Picathartes gymnocephalus*	Yellow-headed Picathartes	VU	x		
Bat	*Rhinolophus hillorum*	Upland Horseshoe Bat	VU		x	
Large Mammal	*Loxodonta africana cyclotis*	Forest Elephant	VU	x	x	x
Large Mammal	*Cephalophus jentinki*	Jentink's Duiker	VU			x
Large Mammal	*Syncerus caffer*	African Buffalo	LR/cd	x		
Damselfly	*Sapho fumosa*		NT		x	
Dragonfly	*Trithemis africana*		NT		x	
Amphibian	*Afrixalus nigeriensis*	Nigeria Banana Frog, Banana Tree Frog	NT		x	x

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Table 2. *(continued)*

Taxon	Species Name	Common Name	Conservation Status*	RAP Survey Site		
				North Lorma	Gola	Grebo
Amphibian	*Bufo togoensis*		NT	x		x
Amphibian	*Hyperolius chlorosteus*		NT		x	x
Amphibian	*Leptopelis macrotis*	Big-eared Forest Frog	NT			x
Amphibian	*Leptopelis occidentalis*	Taï Forest Tree Frog	NT			x
Amphibian	*Petropedetes natator*		NT		x	
Amphibian	*Phrynobatrachus alleni*		NT	x	x	x
Amphibian	*Phrynobatrachus guineensis*		NT			x
Amphibian	*Phrynobatrachus liberiensis*		NT	x	x	x
Amphibian	*Phrynobatrachus phyllophilus*		NT	x	x	x
Amphibian	*Ptychadena superciliaris*		NT			x
Bird	*Bathmocercus cerviniventris*	Black-headed Rufous Warbler	NT	x		
Bird	*Bycanistes cylindricus*	Brown-cheeked Hornbill	NT	x	x	x
Bird	*Ceratogymna elata*	Yellow-casqued Hornbill	NT	x	x	x
Bird	*Illadopsis rufescens*	Rufous-winged Illadopsis	NT	x	x	x
Bird	*Lamprotornis cupreocauda*	Copper-tailed Glossy Starling	NT	x	x	x
Bird	*Malaconotus lagdeni*	Lagden's Bush-shrike	NT			x
Bat	*Hipposideros fuliginosus*	Sooty Leaf-nosed Bat	NT	x		
Bat	*Scotonycteris zenkeri*	Zenker's Fruit Bat	NT			x
Large Mammal	*Cephalophus dorsalis*	Bay Duiker	LR/nt	x	x	x
Large Mammal	*Cephalophus maxwelli*	Maxwell's Duiker	LR/nt	x	x	x
Large Mammal	*Cephalophus niger*	Black Duiker	LR/nt	x	x	x
Large Mammal	*Cephalophus ogilbyi*	Ogilby's Duiker	LR/nt	x		x
Large Mammal	*Cephalophus silvicultor*	Yellow-backed Duiker	LR/nt			x
Large Mammal	*Tragelaphus euryceros*	Bongo	LR/nt			x
Primate	*Cercocebus atys*	Sooty Mangabey	LR/nt	x	x	x
Primate	*Colobus polykomos*	Western Pied Colobus	LR/nt	x		x
Primate	*Procolobus verus*	Olive Colobus	LR/nt			x
Bird	*Melignomon eisentrauti*	Yellow-footed Honeyguide	DD	x		
Bat	*Hypsugo (crassulus) bellieri*	Bellier's Pipistrelle	n.a.		x	
Bat	*Neoromicia* aff. *grandidieri*	Grandidier's Pipistrelle	n.a.		x	
Amphibian	*Bufo superciliaris*	African Giant Toad, Congo Toad	CITES I	x		
Reptile	*Osteolaemus tetraspis*	African Dwarf Crocodile	CITES I		x	x
Large Mammal	*Panthera pardus*	Leopard	CITES I			x
Reptile	*Kinixys eros*	Forest Hingeback Tortoise	CITES II			x
Reptile	*Kinixys homeana*	Home's Hingeback Tortoise	CITES II	x		
Reptile	*Python sebae*	African Rock Python	CITES II	x		
Reptile	*Varanus ornatus*	Ornate Monitor	CITES II		x	

* The IUCN Red List categorizes species based on the degree to which they are threatened. Categories, from less threatened to most threatened, include: Data Deficient (DD, not enough is known to make an assessment), Lower Risk (LR) which includes Conservation Dependent (cd), Near Threatened (nt), and Least Concern (lc, listed but not threatened), Vulnerable (VU), Endangered (EN), and Critically Endangered (CR) (IUCN 2006); n.a.: not assessed by IUCN but likely to be threatened.

*CITES Appendices I, II and III list species afforded different levels or types of protection from over-exploitation (see http://www.cites.org/eng/app/index.shtml).

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- Carry out additional survey work on all taxa at different times of the year for a more comprehensive inventory that would include population estimates and distribution patterns.

- Continue educating local communities that depend on the forest, as well as the general public, on the importance of maintaining healthy, biologically diverse forests and watersheds.

- Enforce existing laws on hunting. Although hunting in national forests is prohibited in Liberia, evidence was found of active poaching in all three forests. Enforcement and education could lead to a diminished bushmeat trade.

- Monitor species of conservation concern. This could be done in collaboration with the government (FDA), NGOs and Liberian universities.

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Appendix 1

Plant species recorded in North Lorma, Gola and Grebo National Forests.

Carel C.H. Jongkind

Herb. = Voucher deposited in National Herbarium Nederland - Wageningen University
-X- = Notes only taken in the field
Photo = Photograph and notes taken
Bold = Endemic to the Upper Guinea forest block
Bold & Underlined = Endemic to Liberia

Species' IUCN and CITES status are not listed because for western African plant species these lists are incomplete and represent only a small number of the plant species that are actually threatened. Combining the IUCN/CITES data with the list below would give a wrong indication for the sites we visited during this RAP survey.

Family	Species	North Lorma	Gola	Grebo
Acanthaceae	***Asystasia scandens* (Lindl.) Hook.**		Herb.	
Acanthaceae	*Asystasia vogeliana* Benth.		Herb.	
Acanthaceae	*Brillantaisia lamium* (Nees) Benth.	Herb.		
Acanthaceae	*Elytraria ivorensis* Dokosi			Herb.
Acanthaceae	*Elytraria marginata* Vahl	Herb.		
Acanthaceae	*Eremomastax speciosa* (Hochst.) Cufod.	Herb.		
Acanthaceae	*Justicia extensa* T.Anderson	Herb.		
Acanthaceae	*Justicia flava* (Forssk.) Vahl	Herb.		
Acanthaceae	*Justicia tenella* (Nees) T.Anderson	Herb.		
Acanthaceae	*Lankesteria brevior* C.B.Clarke		Herb.	
Acanthaceae	*Lepidagathis alopecuroides* (Vahl) R.Br. ex Griseb.	Herb.	Herb.	
Acanthaceae	***Mendoncia combretoides* (A.Chev.) Benoist**		Herb.	Herb.
Acanthaceae	*Physacanthus batanganus* (J.Braun & K.Schum.) Lindau		Herb.	
Acanthaceae	*Physacanthus nematosiphon* (Lindau) Rendle & Britten		Herb.	
Acanthaceae	*Rhinacanthus virens* (Nees) Milne-Redh.	Herb.		
Acanthaceae	*Ruellia primuloides* (T.Anderson ex Benth.) Heine	Herb.	Herb.	Herb.
Acanthaceae	***Staurogyne capitata* E.A.Bruce**	Herb.		Herb.
Acanthaceae	*Thunbergia chrysops* Hook.	Herb.		
Acanthaceae	***Whitfieldia colorata* C.B.Clarke ex Stapf**		Herb.	Herb.
Acanthaceae	***Whitfieldia lateritia* Hook.**	Herb.		Herb.
Adiantaceae	*Adiantum vogelii* Mett. ex Keyserl.	Herb.		Herb.
Adiantaceae	*Pellaea doniana* Hook.	Herb.		

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Family	Species	North Lorma	Gola	Grebo
Amaranthaceae	*Cyathula prostrata* (L.) Blume	Herb.		
Amaryllidaceae	*Crinum natans* Baker		-X-	
Anacardiaceae	*Trichoscypha arborea* (A.Chev.) A.Chev.			Herb.
Anacardiaceae	***Trichoscypha barbata* Breteler**		Herb.	
Anacardiaceae	*Trichoscypha bijuga* Engl.	Herb.	Herb.	
Anacardiaceae	***Trichoscypha linderi* Breteler**		Herb.	
Anacardiaceae	*Trichoscypha lucens* Oliv.			Herb.
Ancistrocladaceae	***Ancistrocladus barteri* Scott-Elliot**			Herb.
Anisophylleaceae	*Anisophyllea meniaudii* Aubrév. & Pellegr.		Herb.	
Annonaceae	*Annickia polycarpa* (DC.) Setten & Maas			Herb.
Annonaceae	*Artabotrys oliganthus* Engl. & Diels		Herb.	
Annonaceae	*Artabotrys* sp.	Herb.		
Annonaceae	*Cleistopholis patens* (Benth.) Engl. & Diels		Herb.	Herb.
Annonaceae	*Friesodielsia* sp.	Herb.		
Annonaceae	*Greenwayodendron oliveri* (Engl.) Verdc.	Herb.		
Annonaceae	*Monanthotaxis* sp. 1	Herb.		
Annonaceae	*Monanthotaxis* sp. 2	Herb.		
Annonaceae	*Monanthotaxis* sp. 3		Herb.	
Annonaceae	***Monocyclanthus vignei* Keay**		Herb.	
Annonaceae	*Monodora myristica* (Gaertn.) Dunal			Herb.
Annonaceae	*Neostenanthera gabonensis* (Engl. & Diels) Exell		Herb.	
Annonaceae	*Piptostigma fasciculatum* (De Wild.) Boutique	Herb.		Herb.
Annonaceae	***Piptostigma fugax* A.Chev. ex Hutch. & Dalziel**		Herb.	
Annonaceae	*Uvaria baumannii* Engl. & Diels			Herb.
Annonaceae	*Uvaria* sp. 1		Herb.	
Annonaceae	*Uvaria* sp. 2			Herb.
Annonaceae	*Uvaria* sp. 3			Herb.
Annonaceae	*Uvariastrum pierreanum* Engl. & Diels	Herb.		Herb.
Annonaceae	*Uvariopsis* sp.	Herb.		
Annonaceae	*Xylopia acutiflora* (Dunal) A.Rich.	Herb.	Herb.	
Annonaceae	*Xylopia le-testui* Pellegr.	Herb.		Herb.
Annonaceae	*Xylopia villosa* Chipp	Herb.		
Apocynaceae	*Alstonia boonei* De Wildeman		-X-	
Apocynaceae	*Ancylobotrys scandens* (Schumach. & Thonn.) Pichon			Herb.
Apocynaceae	*Baissea baillonii* Hua	Herb.		
Apocynaceae	*Callichilia subsessilis* (Benth.) Stapf	Herb.	Herb.	
Apocynaceae	***Hunteria simii* (Stapf) H.Huber**	Herb.	Herb.	Herb.
Apocynaceae	*Landolphia dulcis* (R.Br. ex Sabine) Pichon		Herb.	
Apocynaceae	*Landolphia incerta* (K.Schum.) J.G.M.Pers.			Herb.
Apocynaceae	***Landolphia nitidula* J.G.M.Pers.**			Herb.
Apocynaceae	*Landolphia owariensis* P.Beauv.			Herb.
Apocynaceae	*Oncinotis gracilis* Stapf	Herb.		
Apocynaceae	*Orthopichonia* sp.	Herb.		
Apocynaceae	*Pleiocarpa mutica* Benth.		Herb.	

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Family	Species	North Lorma	Gola	Grebo
Apocynaceae	*Tabernaemontana psorocarpa* (Pierre ex Stapf) Pichon		Herb.	
Araceae	*Amorphophallus* sp.	-X-		
Araceae	***Anubias gigantea* A.Chev. ex Hutch.**	Herb.		
Araceae	*Anubias gracilis* A.Chev. ex Hutch.	Herb.	Herb.	
Araceae	*Cercestis afzelii* Schott	Herb.		-X-
Araceae	*Cercestis dinklagei* Engl.	Herb.		Herb.
Araceae	*Cercestis* sp.	Herb.		
Araceae	*Culcasia angolensis* Welw. ex Schott	Herb.		
Araceae	*Culcasia sapinii* De Wild.	Herb.		Herb.
Araceae	*Culcasia scandens* P.Beauv.	Herb.		Herb.
Araceae	*Rhaphidophora africana* N.E.Br.	Herb.		
Asclepiadaceae	*Periploca nigrescens* Afzel.			Herb.
Asclepiadaceae	*Tylophora cuspidata* (K.Schum.) Meve & Omlor			Herb.
Aspleniaceae	*Asplenium africanum* Desv.	Herb.	Herb.	
Aspleniaceae	*Asplenium anisophyllum* Kunze	Herb.		
Aspleniaceae	*Asplenium barteri* Hook.	Herb.	Herb.	
Aspleniaceae	*Asplenium formosum* Willd.	Herb.		
Aspleniaceae	*Asplenium unilaterale* Lam.	Herb.		
Aspleniaceae	*Asplenium variabile* Hook.		Herb.	Herb.
Begoniaceae	***Begonia cavallyensis* A.Chev.**		Herb.	
Begoniaceae	*Begonia fusialata* Warb. var. *fusialata*	Herb.		Herb.
Begoniaceae	*Begonia polygonoides* Hook.f.	Herb.		
Begoniaceae	*Begonia quadrialata* Warb. subsp. *quadrialata*	Herb.		
Bignoniaceae	*Newbouldia laevis* (P.Beauv.) Seeman ex Bureau	Herb.		
Bombacaceae	*Ceiba pentandra* (L.) Gaertn.	-X-		
Burmanniaceae	*Burmannia congesta* (Wright) Jonker		Herb.	
Burmanniaceae	*Gymnosiphon longistylus* (Benth.) Hutch.	Herb.	Herb.	
Burseraceae	*Dacryodes klaineana* (Pierre) H.J.Lam		Herb.	-X-
Capparaceae	*Euadenia eminens* Hook.f.			Herb.
Capparaceae	*Ritchiea capparoides* (Andr.) Britten		Herb.	Herb.
Celastraceae	*Salacia lehmbachii* Loes.		Herb.	
Celastraceae	*Salacia owabiensis* Hoyle			Herb.
Celastraceae	*Salacia* sp.		Herb.	
Celastraceae	*Salacia staudtiana* Loes.	Herb.		
Chrysobalanaceae	*Afrolicania elaeosperma* Mildbr.	Herb.		
Chrysobalanaceae	***Dactyladenia hirsuta* (A.Chev. & De Wild.) Prance & F.White**		Herb.	
Chrysobalanaceae	***Dactyladenia whytei* (Stapf) Prance & White**		Herb.	
Chrysobalanaceae	*Magnistipula zenkeri* Engl.			Herb.
Chrysobalanaceae	***Maranthes aubrevillei* (Pellegr.) Prance**	Herb.		Herb.
Chrysobalanaceae	*Maranthes glabra* (Oliv.) Prance	Herb.		
Chrysobalanaceae	*Parinari excelsa* Sabine	Herb.		Herb.
Combretaceae	*Combretum aphanopetalum* Engl. & Diels			Herb.
Combretaceae	*Combretum comosum* G.Don			Herb.

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Family	Species	North Lorma	Gola	Grebo
Combretaceae	*Combretum oyemense* Exell	Herb.		
Combretaceae	***Strephonema pseudocola* A.Chev.**	Herb.	Herb.	Herb.
Combretaceae	*Terminalia ivorensis* A.Chevalier	-X-		
Combretaceae	*Terminalia superba* Engler & Diels			-X-
Commelinaceae	***Buforrestia obovata* Brenan**	Herb.		
Commelinaceae	*Commelina capitata* Benth.	Herb.	Herb.	Herb.
Commelinaceae	*Floscopa africana* (P.Beauv.) C.B.Clarke		Herb.	Herb.
Commelinaceae	*Palisota bracteosa* C.B.Clarke	Herb.		Herb.
Commelinaceae	*Pollia condensata* C.B.Clarke	Herb.		Herb.
Commelinaceae	*Polyspatha paniculata* Benth.	Herb.		
Commelinaceae	*Stanfieldiella imperforata* (C.B.Clarke) Brenan	Herb.		
Compositae	*Adenostemma perrottetii* DC.		Herb.	
Compositae	*Chromolaena odorata* (L.) R.M.King & H.Rob.	Herb.		
Compositae	*Vernonia titanophylla* Brenan	-X-		
Connaraceae	*Agelaea paradoxa* Gilg var. *microcarpa* Jongkind	-X-		Herb.
Connaraceae	*Agelaea pentagyna* (Lam.) Baill.	-X-	Herb.	Herb.
Connaraceae	***Cnestis bomiensis* Lemmens**		Herb.	
Connaraceae	*Connarus africanus* Lam.	Herb.		
Connaraceae	*Manotes expansa* Sol. ex Planchon		-X-	
Connaraceae	*Manotes macrantha* (Gilg) Schellenb.		Herb.	
Connaraceae	*Rourea minor* (Gaertn.) Alston		Herb.	Herb.
Connaraceae	*Rourea solanderi* Baker		Herb.	Herb.
Connaraceae	*Rourea thomsonii* (Baker) Jongkind			Herb.
Convolvulaceae	*Bonamia thunbergiana* (Roem. & Schult.) F.N.Williams			Herb.
Convolvulaceae	*Calycobolus africanus* (G.Don) Heine	Herb.		
Convolvulaceae	*Calycobolus heudelotii* (Baker ex Oliv.) **Heine**	Herb.		
Convolvulaceae	*Ipomoea aitonii* Lindl.	Herb.		
Convolvulaceae	*Ipomoea obscura* (L.) Ker Gawl.	Herb.		
Convolvulaceae	*Neuropeltis acuminata* (P.Beauv.) Benth.			Herb.
Convolvulaceae	*Stictocardia beraviensis* (Vatke) Hallier f.	Herb.		
Costaceae	***Costus deistelii* K.Schum.**	Herb.		
Costaceae	*Costus* sp.	-X-	-X-	
Cucurbitaceae	*Momordica charantia* L.	Herb.		
Cucurbitaceae	*Momordica foetida* Schumach.			Herb.
Cyatheaceae	*Cyathea camerooniana* Hook.	Herb.		
Cyperaceae	*Hypolytrum heteromorphum* Nelmes	Herb.		
Cyperaceae	*Hypolytrum purpurascens* Cherm.	Herb.		
Cyperaceae	*Hypolytrum* sp. 1	Herb.		
Cyperaceae	*Hypolytrum* sp. 2			Herb.
Cyperaceae	***Mapania ivorensis* (Raynal) Raynal**		Herb.	
Cyperaceae	***Mapania linderi* Hutch. ex Nelmes**	Herb.	Herb.	
Cyperaceae	*Scleria boivinii* Steud.		-X-	
Cyperaceae	*Scleria naumanniana* Boeckeler		Herb.	

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Family	Species	North Lorma	Gola	Grebo
Dennstaedtiaceae	*Microlepia speluncae* (L.) Moore			Herb.
Dichapetalaceae	*Dichapetalum angolense* Chodat			Herb.
Dichapetalaceae	*Dichapetalum heudelotii* (Planch. ex Oliv.) **Baill.**		Herb.	
Dichapetalaceae	*Dichapetalum* sp.			Herb.
Dichapetalaceae	***Dichapetalum toxicarium* (G.Don) Baill.**			Herb.
Dilleniaceae	*Tetracera alnifolia* Willd.		-X-	-X-
Dioncophyllaceae	***Triphyophyllum peltatum* (Hutch. & Dalziel) Airy Shaw**		Herb.	Herb.
Dioscoreaceae	*Dioscorea* sp.	Herb.		
Dracaenaceae	*Dracaena aubryana* Brongn. ex C.J.Morren	Herb.	-X-	Herb.
Dracaenaceae	*Dracaena camerooniana* Baker			Herb.
Dracaenaceae	***Dracaena cristula* W.Bull**			Herb.
Dracaenaceae	*Dracaena ovata* Ker Gawl.		Herb.	
Dracaenaceae	*Dracaena surculosa* Lindl. var. *maculata* Hook.f.			Herb.
Dracaenaceae	*Sansevieria liberica* Gér. & Labr.	-X-		
Dryopteridaceae	*Callipteris prolifera* (Lam.) Bory			Herb.
Dryopteridaceae	*Tectaria* sp.	Herb.		
Dryopteridaceae	*Triplophyllum buchholzii* (Kuhn) Holttum		Herb.	
Dryopteridaceae	*Triplophyllum* sp. 1	Herb.		
Dryopteridaceae	*Triplophyllum* sp. 2		Herb.	
Dryopteridaceae	*Triplophyllum* sp. 3		Herb.	
Ebenaceae	***Diospyros chevalieri* De Wild.**		Herb.	Herb.
Ebenaceae	*Diospyros ferrea* (Willd.) Bakh.		Herb.	
Ebenaceae	*Diospyros gabunensis* Gürke		Herb.	
Ebenaceae	***Diospyros heudelotii* Hiern**	Herb.		
Ebenaceae	*Diospyros mannii* Hiern	Herb.	Herb.	Herb.
Ebenaceae	*Diospyros sanza-minika* A.Chev.			Herb.
Ebenaceae	*Diospyros soubreana* F.White			Herb.
Ebenaceae	*Diospyros* sp.	Herb.		
Erythroxylaceae	*Erythroxylum mannii* Oliv.			Herb.
Euphorbiaceae	*Alchornea cordifolia* (Schum. & Thonning) Muell.Arg.		-X-	-X-
Euphorbiaceae	*Antidesma* sp.			Herb.
Euphorbiaceae	***Crotonogyne caterviflora* N.E.Br.**		Herb.	
Euphorbiaceae	*Discoglypremna caloneura* (Pax) Prain			Herb.
Euphorbiaceae	***Macaranga heterophylla* (Muell.Arg.) Muell.Arg.**	-X-	-X-	
Euphorbiaceae	*Macaranga hurifolia* Beille			-X-
Euphorbiaceae	*Maesobotrya barteri* (Baillon) Hutch.	-X-		
Euphorbiaceae	*Manniophyton fulvum* Müll.Arg.	-X-	-X-	-X-
Euphorbiaceae	*Mareya micrantha* (Benth.) Müll.Arg.		Herb.	
Euphorbiaceae	***Phyllanthus kerstingii* Brunel**	Herb.		
Euphorbiaceae	*Phyllanthus profusus* N.E.Br.	Herb.		
Euphorbiaceae	*Plesiatropha paniculata* (Pax) Breteler	Herb.		
Euphorbiaceae	*Spondianthus preussii* Engler			-X-
Euphorbiaceae	*Tragia spathulata* Benth.	Herb.		

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Family	Species	North Lorma	Gola	Grebo
Euphorbiaceae	*Uapaca paludosa* Aubrév. & Léandri			Herb.
Flacourtiaceae	*Oncoba brevipes* Stapf		-X-	
Flacourtiaceae	*Oncoba echinata* Oliv.	Herb.		
Gentianaceae	*Anthocleista nobilis* G.Don		-X-	
Gentianaceae	*Voyria primuloides* Baker		Herb.	
Gleicheniaceae	*Dicranopteris linearis* (Burm.) Underwood		-X-	-X-
Gramineae	*Acroceras gabunense* (Hack.) Clayton	Herb.		
Gramineae	*Centotheca lappacea* (L.) Desv.	Herb.	Herb.	
Gramineae	*Guaduella oblonga* Hutch. ex W.D.Clayton	Herb.	Herb.	
Gramineae	*Leptaspis zeylanica* Nees ex Steud.	Herb.		
Gramineae	*Olyra latifolia* L.	Herb.		
Gramineae	*Oplismenus hirtellus* (L.) P.Beauv.	Herb.		
Gramineae	*Panicum laxum* Sw.		Herb.	
Gramineae	*Pseudechinolaena polystachya* (Kunth) Stapf	Herb.		
Gramineae	*Setaria megaphylla* (Steud.) Dur. & Schinz	Herb.		
Gramineae	*Streptogyna crinita* P.Beauv.	Herb.		Herb.
Grammitidaceae	*Cochlidium serrulatum* (Swartz) L.E. Bishop		Herb.	
Guttiferae	*Garcinia epunctata* Stapf			Herb.
Guttiferae	*Harungana madagascariensis* Lamarck ex Poiret		-X-	-X-
Guttiferae	*Mammea africana* Sabine			-X-
Guttiferae	*Pentadesma butyracea* Sabine	-X-	-X-	-X-
Humiriaceae	*Sacoglottis gabonensis* (Baill.) Urb.		Herb.	Herb.
Hymenophyllaceae	*Hymenophyllum hirsutum* (L.) Sw.		Herb.	
Hymenophyllaceae	*Trichomanes chamaedrys* Taton		Herb.	
Hymenophyllaceae	*Trichomanes fallax* Christ	Herb.		
Hymenophyllaceae	*Trichomanes guineense* Afzel. ex Sw.		Herb.	
Icacinaceae	*Desmostachys vogelii* (Miers) Stapf		Herb.	
Icacinaceae	***Iodes liberica* Stapf**			Herb.
Icacinaceae	*Pyrenacantha acuminata* Engl.	Herb.		
Icacinaceae	*Pyrenacantha glabrescens* (Engl.) Engl.			Herb.
Icacinaceae	*Pyrenacantha klaineana* Pierre ex Exell & Mendonça		Herb.	
Icacinaceae	***Rhaphiostylis cordifolia* Hutch. & Dalziel**		Herb.	
Icacinaceae	*Rhaphiostylis* sp. nov.		Herb.	Herb.
Irvingiaceae	*Irvingia gabonensis* (Aubry-Lecomte) Baillon			-X-
Labiatae	*Achyrospermum oblongifolium* Baker	Herb.		Herb.
Labiatae	*Plectranthus epilithicus* B.J.Pollard	Herb.		
Labiatae	*Plectranthus* sp.	Herb.		
Lecythidaceae	*Napoleonaea vogelii* Hook. & Planch.			Herb.
Lecythidaceae	*Petersianthus macrocarpus* (P.Beauv.) Liben	-X-		
Leguminosae-Caes.	*Afzelia* sp.		-X-	
Leguminosae-Caes.	*Anthonotha crassifolia* (Baill.) J.Léonard	Herb.		
Leguminosae-Caes.	*Anthonotha fragrans* (Baker f.) Exell & Hillcoat	Herb.	Herb.	
Leguminosae-Caes.	***Bussea occidentalis* Hutch. ex Chipp.**	Herb.		

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Family	Species	North Lorma	Gola	Grebo
Leguminosae-Caes.	***Copaifera salikounda* Heckel**	Herb.	-X-	Herb.
Leguminosae-Caes.	***Cryptosepalum tetraphyllum* Benth.**	Herb.		
Leguminosae-Caes.	***Daniella thurifera* Bennett**	-X-		
Leguminosae-Caes.	***Dialium aubrevillei* Pellegr.**	Herb.	Herb.	Herb.
Leguminosae-Caes.	*Distemonanthus benthamianus* Baillon	-X-		
Leguminosae-Caes.	*Erythrophleum ivorense* A.Chev.			Herb.
Leguminosae-Caes.	***Gilbertiodendron aylmeri* (Hutch. & Dalziel) J.Léonard**		Herb.	
Leguminosae-Caes.	*Gilbertiodendron preussii* (Harms) J.Léonard	-X-	Herb.	Herb.
Leguminosae-Caes.	*Griffonia simplicifolia* (Vahl ex DC.) **Baillon**			-X-
Leguminosae-Caes.	***Guibourtia leonensis* J.Léonard**	Herb.		
Leguminosae-Caes.	*Paramacrolobium coeruleum* (Taub.) J.Léonard	Herb.		
Leguminosae-Caes.	*Plagiosiphon emarginatus* (Hutch. & Dalziel) J. Léonard	Herb.	Herb.	
Leguminosae-Caes.	*Senna podocarpa* (Guill. & Perr.) Lock	Herb.		
Leguminosae-Caes.	*Senna tora* (L.) Roxb.	Herb.		
Leguminosae-Caes.	***Stachyothyrsus stapfiana* (A.Chev.) J.Léonard & Voorhoeve**		Herb.	
Leguminosae-Caes.	***Tessmannia baikiaeoides* Hutch. & Dalziel**	Herb.		
Leguminosae-Mim.	***Calpocalyx brevibracteatus* Harms**		Herb.	
Leguminosae-Mim.	*Newtonia duparquetiana* (Baill.) Keay	Herb.		
Leguminosae-Mim.	*Newtonia* sp.			Herb.
Leguminosae-Mim.	*Parkia bicolor* A.Chev.	Herb.	-X-	
Leguminosae-Mim.	*Pentaclethra macrophylla* Bentham	-X-		-X-
Leguminosae-Mim.	*Piptadeniastrum africanum* (Hooker f.) Brenan			-X-
Leguminosae-Mim.	***Xylia evansii* Hutch.**	Herb.		
Leguminosae-Pap.	*Abrus fruticulosus* Wall. ex W. & A.	Herb.		
Leguminosae-Pap.	*Amphimas pterocarpoides* Harms			Herb.
Leguminosae-Pap.	*Baphia capparidifolia* Baker subsp. *polygalacea* Brummitt	Herb.		
Leguminosae-Pap.	*Baphia nitida* Lodd.			Herb.
Leguminosae-Pap.	*Dalbergia adamii* Berhaut	Herb.		
Leguminosae-Pap.	*Dalbergia afzeliana* G.Don			Herb.
Leguminosae-Pap.	*Dalbergia heudelotii* Stapf	Herb.		
Leguminosae-Pap.	*Dalbergia oblongifolia* G.Don	Herb.		Herb.
Leguminosae-Pap.	*Dalbergia* sp.		Herb.	
Leguminosae-Pap.	*Leptoderris sassandrensis* Jongkind			Herb.
Leguminosae-Pap.	*Leptoderris* sp. nov.			Herb.
Leguminosae-Pap.	*Millettia chrysophylla* Dunn	Herb.		Herb.
Leguminosae-Pap.	***Millettia lane-poolei* Dunn**	Herb.		
Leguminosae-Pap.	***Millettia liberica* Jongkind**			Herb.
Leguminosae-Pap.	***Millettia lucens* (Scott-Elliot) Dunn**	Herb.		
Leguminosae-Pap.	*Millettia* sp.	Herb.		
Leguminosae-Pap.	***Millettia warneckei* Harms var. *porphyrocalyx* (Dunn) Hepper**	Herb.		
Leguminosae-Pap.	***Platysepalum hirsutum* (Dunn) Hepper**			Herb.
Leguminosae-Pap.	*Vigna gracilis* (Guill. & Perr.) Hook.f.	Herb.		Herb.
Liliaceae	*Asparagus drepanophyllus* Welw.	Herb.		

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Family	Species	North Lorma	Gola	Grebo
Liliaceae	*Chlorophytum alismaefolium* Baker	Herb.		
Liliaceae	*Chlorophytum comosum* (Thunb.) Jacq. var. *sparsiflorum* (Baker) A.D.Poulsen & Nordal	Herb.	Herb.	
Linaceae	*Hugonia* sp.	-X-		
Linaceae	*Ochthocosmus africanus* Hook.f.	Herb.		
Loganiaceae	*Strychnos aculeata* Solereder		-X-	
Loganiaceae	*Strychnos afzelii* Gilg	Herb.		Herb.
Loganiaceae	*Strychnos barteri* Soler.			Herb.
Loganiaceae	*Strychnos camptoneura* Gilg & Busse		Herb.	
Loganiaceae	*Strychnos densiflora* Baill.		Herb.	
Loganiaceae	*Strychnos icaja* Baill.	Herb.		Herb.
Loganiaceae	*Strychnos splendens* Gilg	Herb.		
Loganiaceae	*Strychnos usambarensis* Gilg		Herb.	
Lomariopsidaceae	*Bolbitis acrostichoides* (Afzel. ex Sw.) Ching	Herb.		
Lomariopsidaceae	*Bolbitis salicina* (Hook.) Ching	Herb.	Herb.	
Lomariopsidaceae	*Bolbitis* sp.		Herb.	
Lomariopsidaceae	*Elaphoglossum* sp. 1		Herb.	
Lomariopsidaceae	*Elaphoglossum* sp. 2		Herb.	
Lomariopsidaceae	*Lomariopsis guineensis* (Underw.) Alston		Herb.	Herb.
Lomariopsidaceae	*Lomariopsis palustris* (Hook.) Mett. ex Kuhn	Herb.		Herb.
Loxogrammataceae	*Loxogramme abyssinica* (Baker) M.G.Price	Herb.		
Lycopodiaceae	*Lycopodiella cernua* (L.) Pichi Sermolli			Photo
Malpighiaceae	***Acridocarpus longifolius* (G.Don) Hook.f.**			Herb.
Malpighiaceae	***Acridocarpus plagiopterus* Guill. & Perr.**			Herb.
Malpighiaceae	*Flabellaria paniculata* Cav.	Herb.		
Malvaceae	*Wissadula amplissima* (L.) R.E.Fr. var. *rostrata* (Schumach. & Thonn.) R.E.Fr.	Herb.		
Marantaceae	*Halopegia azurea* (K.Schum.) K.Schum.	Herb.	Herb.	
Marantaceae	***Marantochloa cuspidata* (Rosc.) Milne-Redh.**	Herb.		
Marantaceae	*Marantochloa filipes* (Benth.) Hutch.	Herb.		
Marantaceae	*Marantochloa leucantha* (K.Schum.) Milne-Redh.			Herb.
Marantaceae	*Sarcophrynium brachystachyum* (Benth.) K.Schum.		Herb.	Herb.
Marattiaceae	*Marattia fraxinea* J.Sm.		Herb.	
Medusandraceae	***Soyauxia floribunda* Hutch.**	Herb.		
Melastomataceae	*Calvoa monticola* A.Chev. ex Hutch. & Dalziel	Herb.		
Melastomataceae	*Dicellandra barteri* Hook.f.		Herb.	
Melastomataceae	*Dichaetanthera africana* (Hook.f.) Jacq.-Fél.			Herb.
Melastomataceae	*Guyonia ciliata* Hook.f.		Herb.	
Melastomataceae	*Melastomastrum theifolium* (G.Don) A.Fern. & R.Fern.	Herb.		
Melastomataceae	*Memecylon lateriflorum* (G.Don) Bremek.		Herb.	
Melastomataceae	*Memecylon* sp.	Herb.		
Melastomataceae	*Ochthocharis dicellandroides* (Gilg) C.Hansen & Wickens			Herb.
Melastomataceae	*Tristemma akeassii* Jacq.-Fél.			Herb.
Melastomataceae	***Tristemma coronatum* Benth.**	Herb.	Herb.	

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Family	Species	North Lorma	Gola	Grebo
Melastomataceae	*Warneckea cinnamomoides* (G.Don) Jacq.-Fél.		Herb.	
Melastomataceae	***Warneckea golaensis* (Baker f.) Jacq.-Fél.**	Herb.		
Melastomataceae	*Warneckea memecyloides* (Benth.) Jacq.-Fél.			Herb.
Melastomataceae	*Warneckea* sp.		Herb.	
Meliaceae	*Carapa procera* DC.	Herb.		
Meliaceae	*Entandrophragma angolensis* (Welwitsch) DC.	-X-		
Meliaceae	*Entandrophragma utile* (Dawe & Sprague) Sprague	-X-		
Meliaceae	*Khaya* sp.			-X-
Menispermaceae	***Albertisia ferruginea* (Diels) Forman**		Herb.	
Menispermaceae	***Kolobopetalum leonense* Hutch. & Dalziel**		Herb.	
Menispermaceae	***Penianthus patulinervis* Hutch. & Dalziel**	Herb.		
Menispermaceae	***Tiliacora leonensis* (Scott-Elliot) Diels**			Herb.
Moraceae	*Antiaris toxicaria* (Rumph. ex Pers.) **Leschen.**			-X-
Moraceae	*Ficus barteri* Sprague			Herb.
Moraceae	*Ficus elasticoides* De Wild.			Herb.
Moraceae	*Ficus leonensis* Hutch.		Herb.	
Moraceae	*Ficus lingua* Warb. ex De Wild. & T.Durand subsp. *lingua*			Herb.
Moraceae	*Ficus natalensis* Hochst. subsp. *leprieurii* (Miq.) C.C.Berg	Herb.		
Moraceae	***Ficus pachyneura* C.C.Berg**		Herb.	
Moraceae	*Ficus sansibarica* Warb.	Herb.		
Moraceae	*Ficus saussureana* DC.		Herb.	
Moraceae	*Ficus umbellata* Vahl			Herb.
Moraceae	*Ficus vogeliana* (Miq.) Miq.			Herb.
Moraceae	***Milicia regia* (A.Chev.) C.C.Berg**		Herb.	
Moraceae	*Musanga cecropioides* F.Br.	-X-	-X-	-X-
Moraceae	***Myrianthus libericus* Rendle**	Herb.		
Moraceae	*Streblus usambarensis* (Engl.) C.C.Berg	Herb.		
Moraceae	*Treculia africana* Decne.	Herb.		Herb.
Moraceae	*Trilepisium madagascariense* Thouars ex DC.	Herb.		
Myristicaceae	*Pycnanthus angolensis* (Welwitsch) Warb.	-X-		-X-
Ochnaceae	***Campylospermum amplectens* (Stapf) Farron**		Herb.	
Ochnaceae	*Campylospermum congestum* (Oliv.) Farron	Herb.		
Ochnaceae	*Campylospermum duparquetianum* (Baill.) Tiegh.			Herb.
Ochnaceae	*Campylospermum glaberrimum* (P.Beauv.) Farron		Herb.	
Ochnaceae	*Campylospermum schoenleinianum* (Klotzsch) Farron	Herb.	Herb.	Herb.
Ochnaceae	***Campylospermum subcordatum* (Stapf) Farron**	Herb.	Herb.	
Ochnaceae	*Lophira alata* Banks ex Gaertn.		-X-	-X-
Ochnaceae	*Ochna membranacea* Oliv.	Herb.		
Ochnaceae	*Rhabdophyllum calophyllum* (Hook.f.) Tiegh.	Herb.		
Olacaceae	*Coula edulis* Baill.			Herb.
Olacaceae	*Heisteria parvifolia* Sm.		-X-	Herb.
Olacaceae	*Olax gambecola* Baill.	Herb.		
Olacaceae	***Ptychopetalum anceps* Oliv.**		Herb.	Herb.

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Family	Species	North Lorma	Gola	Grebo
Olacaceae	*Strombosia pustulata* Oliv.		Herb.	Herb.
Oleaceae	*Jasminum pauciflorum* Benth.	Herb.		
Oleandraceae	*Arthropteris palisotii* (Desv.) Alston			Herb.
Oleandraceae	*Nephrolepis biserrata* (Sw.) Schott	Herb.		
Orchidaceae	*Angraecum birrimense* Rolfe	Herb.		
Orchidaceae	*Angraecum distichum* Lindl.		Herb.	
Orchidaceae	*Angraecum podochiloides* Schltr.		Herb.	
Orchidaceae	*Angraecum subulatum* Lindl.	Herb.		
Orchidaceae	*Bulbophyllum magnibracteatum* Summerh.		Herb.	
Orchidaceae	*Bulbophyllum oreonastes* Rchb.f.		Herb.	
Orchidaceae	*Calyptrochilum christyanum* (Rchb.f.) Summerh.			Herb.
Orchidaceae	*Chamaeangis odoratissima* (Rchb.f.) Schltr.			Herb.
Orchidaceae	*Habenaria macrandra* Lindl.	Herb.		
Orchidaceae	*Nervilia* sp.	Photo		
Orchidaceae	*Oeceoclades maculata* (Lindley) Lindley	Photo		
Orchidaceae	*Polystachya* Hook.			Herb.
Orchidaceae	*Polystachya polychaete* Kraenzl.		Herb.	
Orchidaceae	*Tridactyle bicaudata* (Lindl.) Schltr.		Herb.	
Orchidaceae	*Vanilla africana* Lindl.	Herb.		
Palmae	*Eremospatha* sp.		-X-	
Palmae	*Laccosperma* sp.		-X-	
Palmae	*Raphia hookeri* Mann & Wendl.			-X-
Palmae	***Raphia palma-pinus* (Gaertn.) Hutch.**	-X-		
Pandaceae	*Microdesmis keayana* J.Léonard	Herb.		-X-
Pandaceae	*Panda oleosa* Pierre			Herb.
Passifloraceae	*Adenia cissampeloides* (Planch. ex Benth.) Harms			Herb.
Passifloraceae	*Adenia lobata* (Jacq.) Engler			-X-
Passifloraceae	*Adenia mannii* (Mast.) Engl.			Herb.
Passifloraceae	***Androsiphonia adenostegia* Stapf**		Herb.	
Passifloraceae	***Crossostemma laurifolium* Planch. ex Benth.**	Herb.		
Passifloraceae	*Smeathmannia pubescens* Sol. ex R.Br.	Herb.		
Piperaceae	*Peperomia rotundifolia* (L.) H.B.& K.	Herb.		
Piperaceae	*Piper guineense* Schum. & Thonning	-X-	-X-	-X-
Piperaceae	*Piper umbellatum* L.			-X-
Polygalaceae	*Carpolobia alba* G.Don	Herb.		
Polygonaceae	*Afrobrunnichia erecta* (Asch.) Hutch. & Dalziel	-X-		Herb.
Polypodiaceae	*Drynaria laurentii* (Christ) Hieronymus			-X-
Polypodiaceae	*Microgramma lycopodioides* (L.) Copel.			Herb.
Polypodiaceae	*Microsorium punctatum* (L.) Copeland	-X-		-X-
Polypodiaceae	*Phymatosorus scolopendria* (Burm.f.) Pic.Serm.			Herb.
Polypodiaceae	*Platycerium stemaria* (P.Beauv.) Desvaux	-X-		Photo
Pteridaceae	*Pityrogramma calomelanos* (L.) Link			-X-
Pteridaceae	*Pteris burtonii* Baker		Herb.	

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Family	Species	North Lorma	Gola	Grebo
Putranjivaceae	*Drypetes gilgiana* (Pax) Pax & K.Hoffm.	Herb.	Herb.	
Putranjivaceae	*Drypetes inaequalis* Hutch.	Herb.		
Putranjivaceae	***Drypetes* sp. nov.**			Herb.
Rapateaceae	***Maschalocephalus dinklagei* Gilg & K.Schum.**		Herb.	
Rhamnaceae	*Lasiodiscus fasciculiflorus* Engl.	Herb.	Herb.	
Rhamnaceae	*Lasiodiscus mannii* Hook.f.		Herb.	
Rhamnaceae	*Ventilago africana* Exell			Herb.
Rhizophoraceae	***Cassipourea nialatou* Aubrév. & Pellegr.**			Herb.
Rubiaceae	***Argocoffeopsis afzelii* (Hiern) Robbr.**	Herb.		
Rubiaceae	***Argostemma pumilum* Benn.**		Herb.	
Rubiaceae	*Bertiera bracteolata* Hiern			Herb.
Rubiaceae	*Bertiera breviflora* Hiern.	Herb.		
Rubiaceae	*Bertiera racemosa* (G.Don) K.Schum.			Herb.
Rubiaceae	***Bertiera spicata* (C.F.Gaertn.) K.Schum.**		Herb.	
Rubiaceae	***Cephaelis micheliae* J.-G.Adam**		Herb.	
Rubiaceae	*Chassalia afzelii* (Hiern) K.Schum.			Herb.
Rubiaceae	***Chassalia corallifera* (A.Chev. ex De Wild.) Hepper**		Herb.	
Rubiaceae	***Chassalia* sp. nov.**		Herb.	
Rubiaceae	*Corynanthe pachyceras* K.Schum.			Herb.
Rubiaceae	*Craterispermum caudatum* Hutch.			Herb.
Rubiaceae	*Cremaspora triflora* (Thonn.) K.Schum.			Herb.
Rubiaceae	*Gaertnera longevaginalis* (Hiern) E.M.A.Petit	Herb.		
Rubiaceae	*Gaertnera* sp.		Herb.	
Rubiaceae	*Gardenia nitida* Hook.	Herb.		
Rubiaceae	*Geophila afzelii* Hiern	Herb.		Herb.
Rubiaceae	*Geophila obvallata* (Schumach.) F.Didr.	Herb.		
Rubiaceae	*Heinsia crinita* (Afzel.) G.Taylor	-X-	Herb.	-X-
Rubiaceae	*Hutchinsonia barbata* Robyns		Herb.	
Rubiaceae	*Hymenocoleus neurodictyon* (K.Schum.) Robbr.	Herb.		
Rubiaceae	*Hymenocoleus* sp. 1		Herb.	
Rubiaceae	*Hymenocoleus* sp. 2		Herb.	
Rubiaceae	***Ixora aggregata* Hutch.**			Herb.
Rubiaceae	***Ixora nimbana* Schnell**	Herb.		
Rubiaceae	***Keetia bridsoniae* Jongkind**	Herb.		
Rubiaceae	*Keetia leucantha* (Krause) Bridson			Herb.
Rubiaceae	***Keetia obovata* Jongkind**		Herb.	
Rubiaceae	*Keetia rufivillosa* (Robyns ex Hutch. & Dalziel) Bridson	Herb.		Herb.
Rubiaceae	*Keetia* sp.		Herb.	
Rubiaceae	*Lasianthus batangensis* K.Schum.	Herb.	Herb.	
Rubiaceae	*Lasianthus repens* Hepper	Herb.		
Rubiaceae	*Massularia acuminata* (G.Don) Bullock ex Hoyle	Herb.		
Rubiaceae	***Mussaenda chippii* Wernham**		Herb.	
Rubiaceae	***Mussaenda grandiflora* Benth.**			Herb.

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Family	Species	North Lorma	Gola	Grebo
Rubiaceae	*Nauclea diderrichii* (De Wild. & Th.Dur.) Merrill	-X-		-X-
Rubiaceae	*Nauclea vanderguchtii* (De Wild.) Petit		Herb.	
Rubiaceae	*Nichallea soyauxii* (Hiern) Bridson			Herb.
Rubiaceae	*Oxyanthus formosus* Hook.f. ex Planch.	Herb.		
Rubiaceae	*Parapentas setigera* (Hiern) Verdc.	Herb.		
Rubiaceae	*Pauridiantha sylvicola* (Hutch. & Dalziel) Bremek.	Herb.	Herb.	Herb.
Rubiaceae	*Pavetta* sp.		Herb.	
Rubiaceae	*Poecilocalyx stipulosa* (Hutch. & Dalziel) N.Hallé		Herb.	
Rubiaceae	*Psychotria biaurita* (Hutch. & Dalziel) Verdc.	Herb.		
Rubiaceae	*Psychotria gabonica* Hiern			Herb.
Rubiaceae	***Psychotria kwewonii* Jongkind ined.**			Herb.
Rubiaceae	***Psychotria ombrophila* (Schnell) Verdc.**		Herb.	
Rubiaceae	*Psychotria peduncularis* (Salisb.) Verdcourt			-X-
Rubiaceae	*Psychotria* sp. 1	Herb.		
Rubiaceae	*Psychotria* sp. 2			Herb.
Rubiaceae	*Psychotria* sp. 3			Herb.
Rubiaceae	*Psychotria* sp. 4			Herb.
Rubiaceae	***Psychotria yapoensis* (Schnell) Verdc.**			Herb.
Rubiaceae	*Rothmannia whitfieldii* (Lindl.) Dandy		Herb.	
Rubiaceae	*Rytigynia canthioides* (Benth.) Robyns			Herb.
Rubiaceae	***Sabicea ferruginea* Benth.**		-X-	Herb.
Rubiaceae	*Sabicea rosea* Hoyle			Herb.
Rubiaceae	***Schizocolea linderi* (Hutch. & Dalziel) Bremek.**	Herb.	Herb.	
Rubiaceae	***Sericanthe adamii* (N.Hallé) Robbr.**		Herb.	
Rubiaceae	***Sherbournia calycina* (G.Don) Hua**			Herb.
Rubiaceae	***Stelechantha ziamaeana* (Jacq.-Fél.) N.Hallé**	Herb.	Herb.	Herb.
Rubiaceae	*Tarenna fusco-flava* (K.Schum.) S.Moore			Herb.
Rubiaceae	*Tarenna* sp.		Herb.	
Rubiaceae	*Tricalysia pallens* Hiern			Herb.
Rubiaceae	*Tricalysia reflexa* Hutch.		Herb.	
Rubiaceae	*Tricalysia* sp. nov.		Herb.	
Rubiaceae	*Trichostachys aurea* Hiern	Herb.		-X-
Rubiaceae	*Uncaria africana* G.Don		-X-	-X-
Rubiaceae	*Virectaria procumbens* (Sm.) Bremek.		Herb.	Herb.
Rubiaceae	*Virectaria* sp.		Herb.	
Rutaceae	*Vepris* sp.		Herb.	
Rutaceae	*Vepris verdoorniana* (Exell & Mendonça) W.Mziray	Herb.		
Rutaceae	***Zanthoxylum psammophilum* (Aké Assi) Waterman**		Herb.	
Rutaceae	*Zanthoxylum* sp.	-X-		
Sapindaceae	*Allophylus* sp.		Herb.	
Sapindaceae	*Chytranthus carneus* Radlk.	Herb.	Herb.	Herb.
Sapindaceae	*Chytranthus* sp.	Herb.		
Sapindaceae	*Eriocoelum racemosum* Baker		Herb.	

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Family	Species	North Lorma	Gola	Grebo
Sapindaceae	*Pancovia* sp.	Herb.		
Sapindaceae	*Paullinia pinnata* Linné	-X-		
Sapindaceae	***Placodiscus pseudostipularis* Radlk.**		Herb.	
Sapotaceae	*Chrysophyllum africanum* A.DC.	Herb.	Herb.	Herb.
Sapotaceae	*Chrysophyllum subnudum* Baker	Herb.		
Sapotaceae	*Chrysophyllum welwitschii* Engl.	Herb.		Herb.
Sapotaceae	*Delpydora gracilis* A.Chev.		Herb.	
Sapotaceae	*Englerophytum* sp.		Herb.	
Sapotaceae	*Gluema ivorensis* Aubrév. & Pellegr.		Herb.	
Sapotaceae	*Ituridendron bequaertii* De Wild.			Herb.
Sapotaceae	*Manilkara* sp.		Herb.	
Sapotaceae	*Neolemonniera* sp. Heine	Herb.		
Sapotaceae	*Pouteria aningeri* Baehni	Herb.		Herb.
Scytopetalaceae	*Scytopetalum tieghemii* Hutch. & Dalziel			Herb.
Selaginellaceae	*Selaginella cathedrifolia* Spring	Herb.	Herb.	
Selaginellaceae	*Selaginella myosurus* (Swartz) Alston			-X-
Selaginellaceae	*Selaginella soyauxii* Hieron.	Herb.		
Selaginellaceae	*Selaginella versicolor* Spring	Herb.		
Simaroubaceae	*Hannoa klaineana* Pierre ex Engl.	Herb.		
Solanaceae	*Solanum terminale* Forssk.	Herb.		
Sterculiaceae	***Cola buntingii* Baker f.**		Herb.	Photo
Sterculiaceae	***Cola caricifolia* (G.Don) K.Schum.**			-X-
Sterculiaceae	*Cola heterophylla* (P.Beauv.) Schott. & Endl.	Herb.		
Sterculiaceae	*Cola lateritia* K.Schum.			-X-
Sterculiaceae	*Cola* sp.	Herb.		
Sterculiaceae	***Heritiera utilis* Sprague**	Herb.	Herb.	-X-
Sterculiaceae	***Leptonychia occidentalis* Keay**			Herb.
Sterculiaceae	*Sterculia* sp.			Herb.
Sterculiaceae	*Triplochiton scleroxylon* K.Schum.			-X-
Thelypteridaceae	*Cyclosorus striatus* (Schum.) Ching	Herb.		
Thymelaeaceae	*Dicranolepis* sp.	-X-		-X-
Tiliaceae	*Desplatsia chrysochlamys* (Mildbr. & Burret) Mildbr. & Burret	Herb.		Herb.
Tiliaceae	*Grewia malacocarpa* Mast.	Herb.		
Tiliaceae	*Grewia pubescens* P.Beauv.	Herb.		
Urticaceae	*Urera* sp.	-X-		
Verbenaceae	***Vitex phaeotricha* Mildbr. ex W.Piep.**			Herb.
Violaceae	*Decorsella paradoxa* A.Chev.		Herb.	Herb.
Violaceae	*Rinorea brachypetala* (Turcz.) Kuntze	Herb.		
Violaceae	*Rinorea breviracemosa* Chipp	Herb.	Herb.	
Violaceae	*Rinorea ilicifolia* (Welw. ex Oliv.) **Kuntze**	Herb.		Herb.
Violaceae	***Rinorea microdon* M.Brandt**	Herb.	Herb.	
Violaceae	*Rinorea oblongifolia* (C.H.Wright) Marquand ex Chipp	Herb.		
Violaceae	*Rinorea* sp.			Herb.

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Family	Species	North Lorma	Gola	Grebo
Vitaceae	*Cissus diffusiflora* (Baker) Planch.	Herb.		
Vitaceae	***Cissus miegei* Tchoumé**			Herb.
Vitaceae	*Cissus producta* Afzel.			Herb.
Vitaceae	*Cissus smithiana* (Baker) Planch.			Herb.
Vitaceae	*Cissus* sp.	Herb.		
Vitaceae	*Leea guineensis* G.Don			-X-
Vittariaceae	*Antrophyum mannianum* Hook.	Herb.		
Vittariaceae	*Vittaria guineensis* Desv.	Herb.		
Zingiberaceae	*Aframomum* sp.		-X-	
Zingiberaceae	***Renealmia longifolia* K.Schum.**		Herb.	

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Appendix 2

Checklist of Odonata recorded from Liberia and neighboring areas.

Klaas-Douwe B. Dijkstra

RL: Unpublished global or western African (between brackets) Red List assessment made by the author (assessed May, evaluated August 2006).

Biology (preferences are inferred from observations during the fieldwork, augmented with previous experience):
B: biogeography of the species. **A:** all over tropical Africa including savannahs, **G:** confined to Guineo-Congolian forest, **N:** associated with northern African savannah (Senegal to Ethiopia), **U:** confined to Upper Guinean forest (Sierra Leone to Togo), **W:** confined to western Africa forest (Senegal to Cameroon).
L: preferred landscape. **F:** forest, **O:** open habitats.
W: preferred water type. **R:** running; **S:** standing.

Liberian records (type locality lies in Liberia if species marked with asterisk):
NL, Go, Gr: North Lorma, Gola and Grebo National Forests.
A: adult voucher obtained; **L:** larval voucher obtained; **S:** adults caught for identification or seen only; records obtained nearby but outside the national forest are given between brackets.
Li: country records after Lempert (1988) and current survey. **1:** species found in current survey (! indicates new national record), **2:** found by Lempert, **3:** found by Lempert, but identification requires confirmation, **4:** literature record listed by Lempert; **5:** not listed by Lempert, but by Pinhey (1984). Species with old or dubious records (probable misidentifications) that are removed from the list until confirmed are: *Sapho orichalcea* McLachlan, 1869; *Umma puella* (Sjöstedt, 1917); *Ceriagrion ignitum* Campion, 1914; *Trithemis nuptialis* Karsch, 1894.

Neighboring areas (type locality lies in stated area if species marked with asterisk):
SL: Sierra Leone records after Carfi and D'Andrea (1994) and Marconi and Terzani (2006). **1:** authors' material; **2:** authors' material, identification requires confirmation; **3:** Aguesse (1968) records; **4:** other literature records. Omitted are: *Stenocnemis pachystigma* (Selys, 1886); *Elattoneura pruinosa* (Selys, 1886); *Agriocnemis forcipata* Le Roi, 1915; *Pseudagrion nubicum* Selys, 1876; *Anaciaeschna triangulifera* McLachlan, 1896; *Anax speratus* Hagen, 1867; *Diastatomma* sp. Gambles, 1987; *Phyllogomphus aethiops* Selys, 1854; *Phyllomacromia monoceros* (Förster, 1906); *Orthetrum caffrum* (Burmeister, 1839); *Orthetrum machadoi* Longfield, 1955; *Porpax asperipes* Karsch, 1896; *Trithemis dorsalis* (Rambur, 1842).
MN: Mt Nimba (Guinean side) records after Legrand (2003). **1:** author's material; **2:** author's material, identification requires confirmation; **3:** uncertain records, mostly personal communication P. Aguesse. Omitted are: *Lestes tridens* McLachlan, 1895; *Phyllomacromia aequatorialis* Martin, 1907; *Trithemis furva* Karsch, 1899.
Si: Simandou (Guinea) records after Legrand and Girard (1992). **1:** identification reliable; **2:** identification requires confirmation.
TF: Tai Forest (Côte d'Ivoire) records after Legrand and Couturier (1985): 1.

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Taxa	Notes	RL	Biology			Liberian records				Neighboring areas			
			B	L	W	NL	Go	Gr	Li	SL	MN	Si	TF
Calopterygidae													
Phaon camerunensis Sjöstedt, 1900	1.		G	F	R	A		A	1	2	1	1	1
Phaon iridipennis (Burmeister, 1839)			A	O	R	A	A		1	1	1	1	1
Sapho bicolor Selys, 1853			G	F	R	A	A	S	1	1	1	1	1
Sapho ciliata (Fabricius, 1781)			W	F	R	A	A	A	1	1	1	1	1
Sapho fumosa Longfield, 1932	2.	NT	U	F	R		A		1	3*	1		
Umma cincta (Hagen in Selys, 1853)			G	F	R	A	A	S	1		1	1	1
Chlorocyphidae													
Chlorocypha curta (Hagen in Selys, 1853)			G	O	R				2	1	1	1	
Chlorocypha dispar (Palisot de Beauvois, 1807)			G	F	R	A	A	A	1	1	1	1	1
Chlorocypha luminosa (Karsch, 1893)	3.		U	F	R				2		1		
Chlorocypha pyriformosa Fraser, 1947	4.		G	F	R	A		S	1	1			1
Chlorocypha radix Longfield, 1959	5.		W	F	R	A	S	A	1	1	1	1	1
Chlorocypha rubida (Hagen in Selys, 1853)			W	F	R				2	1	3		1
Chlorocypha selysi (Karsch, 1899)			G	F	R	A	A	A	1	1	1	1	1
Lestidae													
Lestes dissimulans Fraser, 1955			A	O	S						1		1
Platycnemididae													
Mesocnemis singularis Karsch, 1891			A	O	R	S	S	A	1	1	1		1
Mesocnemis tisi Lempert, 1992	6.	EN	U	F	R				2*				
Platycnemis guttifera Fraser, 1950			W	F	R	A		A	1				1
Platycnemis sikassoensis (Martin, 1912)			G	O	R				2	1	1	1	1
Protoneuridae													
Chlorocnemis elongata Hagen in Selys, 1863			W	F	R	A	S	A	1	1	1	1	
Chlorocnemis flavipennis Selys, 1863	7.		W	F	R		A	A	1	1	1	1	
Chlorocnemis subnodalis (Selys, 1886)	8.		W	F	R	A	A	A	1	1	1		1
Elattoneura balli Kimmins, 1938			W	F	R	A	A	A	1	1*	1	1	1
Elattoneura dorsalis Kimmins, 1938		VU	U	F	R					1*			
Elattoneura girardi Legrand, 1980	9.		W	F	R				2	1	1		1
Elattoneura nigra Kimmins, 1938			G	O	R					1	1		
Prodasineura villiersi Fraser, 1948			U	F	R	A	A	A	1		1		1
Coenagrionidae													
Aciagrion africanum Martin, 1908			G	O	S				2		1		
Aciagrion gracile (Sjöstedt, 1909)			A	O	S						1		1
Africallagma subtile (Ris, 1921)	10.		A	O	S					1	1	1	
Agriocnemis angustirami Pinhey, 1974		VU	U	?	S				2*	1			
Agriocnemis exilis Selys, 1872			A	O	S				2	1			
Agriocnemis maclachlani Selys, 1877			G	F	S			A	1	3	1		1
Agriocnemis victoria Fraser, 1928	11.		G	O	S				2	1	3		
Agriocnemis zerafica Le Roi, 1915			A	O	S				2				
Argiagrion leoninum Selys, 1876	12.	DD	U	?	?					4*			
Ceriagrion bakeri Fraser, 1941			G	O	S			A	1	1	2		1

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Taxa	Notes	RL	Biology			Liberian records				Neighboring areas			
			B	L	W	NL	Go	Gr	Li	SL	MN	Si	TF
Ceriagrion corallinum Campion, 1914			G	O	S		A		1	1*			
Ceriagrion glabrum (Burmeister, 1839)			A	O	S	S	S		1	1	1	1	1
Ceriagrion rubellocerinum Fraser, 1947			G	F	S	A		A	1	1	1		1
Ceriagrion suave Ris, 1921	13.		A	O	S				3	1	2		
Ceriagrion tricrenaticeps Legrand, 1984		(DD)	G	?	S				2				
Ceriagrion whellani Longfield, 1952			A	O	S				2	3	1		
Ischnura senegalensis (Rambur, 1842)			A	O	S				2	1			
Pseudagrion aguessei Pinhey, 1964			N	O	R					3*			
Pseudagrion camerunense (Karsch, 1899)	14.		W	O	R				2	1			
Pseudagrion epiphonematicum Karsch, 1891			G	F	R	A	A	A	1	3	1	1	
Pseudagrion gigas Ris, 1936			N	?	R					3	1		
Pseudagrion glaucescens Selys, 1876			A	O	S				2	1	3		
Pseudagrion glaucoideum Schmidt in Ris, 1936			G	F	S	S			1				
Pseudagrion glaucum (Sjöstedt, 1900)	15.		G	O	S				2				
Pseudagrion hamoni Fraser, 1955			A	O	S					1		2	
Pseudagrion hemicolon Karsch, 1899	16.		G	F	R	A	A	A	1	1		1	1
Pseudagrion kersteni Gerstäcker, 1869			A	O	R					1			
Pseudagrion mascagnii Terzani & Marconi, 2004		CR	U	?	?					1*			
Pseudagrion melanicterum Selys, 1876			G	O	R	A	A	A	1	1	1	1	1
Pseudagrion sjoestedti Förster, 1906			A	O	R		A	S	1	1			1
Pseudagrion sublacteum (Karsch, 1893)			A	O	S				2	1		2	1
"*Pseudagrion*" *cyathiforme* Pinhey, 1973	17.		W	F	R				2	1			
"*Pseudagrion*" *malagasoides* Pinhey, 1973	18.		W	F	R				2				
Aeshnidae													
Anax chloromelas Ris, 1911			A	O	S					4			
Anax imperator Leach, 1815			A	O	S	S			1			1	
Anax tristis Hagen, 1867			A	O	S				2		3		
Gynacantha africana (Palisot de Beauvois, 1807)			G	F	S								1
Gynacantha bullata Karsch, 1891			G	F	S	S		A	1	1	1	1	1
Gynacantha cylindrata Karsch, 1891			G	F	S				2	1	3		1
Gynacantha manderica Grünberg, 1902			A	O	S					1	3		
Gynacantha nigeriensis (Gambles, 1956)	19.		G	F	S					1			
Gynacantha sextans McLachlan, 1896			G	F	S						1		1
Gynacantha sp. indet.	20.		?	?	?				3				
Gynacantha vesiculata Karsch, 1891			G	F	S				2	1	3		
Heliaeschna fuliginosa Karsch, 1893	21.		G	F	S		A	A	1	1			1
Heliaeschna cf. *cynthiae* Fraser, 1939	22.		?	?	?				3				
Gomphidae													
Diastatomma gamblesi Legrand, 1992	23.		U	F	R				2		1*		
Gomphidia bredoi (Schouteden, 1934)	24.		N	O	R								1
Gomphidia gamblesi Gauthier, 1987			W	F	R			S	1		1		
Ictinogomphus ferox (Rambur, 1842)			A	O	R					1	3		
Ictinogomphus fraseri Kimmins, 1958			W	F	R					1*			

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Lestinogomphus africanus (Fraser, 1926)		DD	?	F	R					4*			
Lestinogomphus matilei Legrand & Lachaise, 2001	25.		U	F	R				2				
Lestinogomphus n. sp. 1	26.		U	F	R				3				
Lestinogomphus n. sp. 2	27.		U	F	R				3				
Lestinogomphus sp. indet.			?	F	R	S		L	1				
Microgomphus jannyae Legrand, 1992			U	F	R						1*		
Microgomphus sp. indet.	28.		?	F	R	A			1				
Onychogomphus xerophilus Fraser, 1956	29.	(DD)	U	F	R					2	2		
Paragomphus genei (Selys, 1841)			A	O	S				2	1			
Paragomphus kiautai Legrand, 1992		DD	U	F	R						1*		
Paragomphus mariannae Legrand, 1992	30.	DD	U	F	R				2		1*		
Paragomphus nigroviridis Cammaerts, 1968			G	F	R		A		1!				
Paragomphus serrulatus (Baumann, 1898)	31.		N	F	R				2	1			
Paragomphus tournieri Legrand, 1992	32.	DD	U	F	R				2		1*		
Paragomphus n. sp. cf. *elpidius* Ris, 1921	33.		U	F	R				2				
Paragomphus sp. indet.			?	F	R	L	L		1				
Phyllogomphus bartolozzii Marconi, Terzani & Carletti, 2001	34.	DD	U	F	R					1*			
Phyllogomphus helenae Lacroix, 1921		DD	U	F	R					4*			
Phyllogomphus moundi Fraser, 1960			W	F	R		A	S	1!		1		
Phyllogomphus n. sp.	35.		U	F	R				2				
Tragogomphus christinae Legrand, 1992	36.	DD	U	F	R				2		1*		
Tragogomphus sp. indet.			?	F	R		L		1				
Corduliidae													
Idomacromia lieftincki Legrand, 1984			G	F	R				2		1		
Idomacromia proavita Karsch, 1896			G	F	R						1		1
Neophya rutherfordi Selys, 1881			G	F	R				2	1	1		
Phyllomacromia aeneothorax (Nunney, 1895)		(DD)	G	F	R				2	4	1	1	
Phyllomacromia contumax Selys, 1879	37.		A	O	R				2				
Phyllomacromia funicularioides (Legrand, 1983)		NT	U	F	R				2		1*		
Phyllomacromia hervei (Legrand, 1980)			G	F	R	A		A	1				
Phyllomacromia kimminsi (Fraser, 1954)			A	F	R					1*			
Phyllomacromia lamottei (Legrand, 1993)	38.	DD	U	F	R				2		1*		
Phyllomacromia melania (Selys, 1871)	39.		G	F	R	A	A		1	4	1		
Phyllomacromia occidentalis (Fraser, 1954)		(DD)	U	F	R				2				
Phyllomacromia sophia (Selys, 1871)			U	F	R		A		1	4	1		1
Libellulidae													
Acisoma panorpoides Rambur, 1842			A	O	S	S	S	(S)	1	1	1		1
Acisoma trifidum Kirby, 1889			G	O	S	S	S	(S)	1	1	1		
Aethiothemis bella (Fisher, 1939)	40.	(DD)	G	F	?					3			
Aethiothemis solitaria Martin, 1908			A	O	S					2			
Aethriamanta rezia Kirby, 1889			A	O	S	S	S	S	1		1		
Atoconeura luxata Dijkstra, 2006	41.	(VU)	G	F	R					1	1		

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			B	L	W	NL	Go	Gr	Li	SL	MN	Si	TF
Brachythemis lacustris (Kirby, 1889)			A	O	S				2				
Bradinopyga strachani (Kirby, 1900)			N	O	S		A		1	1	3		
Chalcostephia flavifrons Kirby, 1889			A	O	S	S	S	S	1	1	1		
Crocothemis divisa Baumann, 1898	42.		A	O	S				5	1	1		
Crocothemis erythraea (Brullé, 1832)			A	O	S	S	S	(S)	1	1	3		
Crocothemis sanguinolenta (Burmeister, 1839)			A	O	R		(S)		1	1	1	1	
Cyanothemis simpsoni Ris, 1915			G	F	R	A	S	S	1	4*	1		1
Diplacodes deminuta Lieftinck, 1969	43.	(DD)	A	O	S				2				
Diplacodes lefebvrii (Rambur, 1842)			A	O	S		A	(S)	1	1	1		
Diplacodes luminans (Karsch, 1893)	44.		A	O	S				2	1	3		
Eleuthemis buettikoferi Ris, 1910			G	F	R			S	1*	2	2		
Eleuthemis n. sp.			U	F	R		A		1				
Hadrothemis camarensis (Kirby, 1889)	45.		G	F	S	S	A	A	1	1	1		1
Hadrothemis coacta (Karsch, 1891)			G	F	S			A	1		3		1
Hadrothemis defecta (Karsch, 1891)			G	F	S	S	A	S	1	1	1		
Hadrothemis infesta (Karsch, 1891)			G	F	S	A	A	S	1	4	1		1
Hadrothemis versuta (Karsch, 1891)			G	F	S	S	A		1		1		
Hemistigma albipunctum (Rambur, 1842)			A	O	S		A		1	1	3		
Lokia incongruens (Karsch, 1893)	46.		W	F	R				2				
Malgassophlebia bispina Fraser, 1958			G	F	R				2		1		
Micromacromia camerunica Karsch, 1890	47.		G	F	R	A			1	4			
Micromacromia zygoptera (Ris, 1909)	48.		G	F	R			A	1	1	1		1
Neodythemis campioni Ris, 1915	49.	NT	U	F	R				2	4*	2		
Neodythemis klingi (Karsch, 1890)	50.		G	F	R		A	A	1	1	1		1
Nesciothemis minor Gambles, 1966			N	O	R			(A)	1!	1	1		
Nesciothemis nigeriensis Gambles, 1966			N	O	S					3			
Nesciothemis pujoli Pinhey, 1971	51.		N	O	S				4	1	2		
Notiothemis robertsi Fraser, 1944			G	F	S		S		1		1		
Olpogastra lugubris Karsch, 1895			A	O	R		A	S	1	3	1	1	
Orthetrum abbotti Calvert, 1892			A	O	S	A	A		1	1	1		
Orthetrum africanum (Selys, 1887)			G	F	R				2	4	1		
Orthetrum angustiventre (Rambur, 1842)			A	O	S				2	1			
Orthetrum austeni (Kirby, 1900)			G	O	S	S	S	S	1	1*	1		1
Orthetrum brachiale (Palisot de Beauvois, 1817)			A	O	S		A		1	1	3		1
Orthetrum chrysostigma (Burmeister, 1839)			A	O	S				2	1	3		
Orthetrum guineense Ris, 1910			A	O	R				4	1	1		
Orthetrum hintzi Schmidt, 1951			A	O	S		A	S	1	1	1		1
Orthetrum icteromelas Ris, 1910	52.		A	O	S				2	4			
Orthetrum julia Kirby, 1900			A	O	R	A	A	S	1	1*	1	1	1
Orthetrum latihami Pinhey, 1966	53.		N	O	?					1	1		
Orthetrum microstigma Ris, 1911			G	O	S	A	A	S	1	1	1	1	1
Orthetrum monardi Schmidt, 1951			A	O	S					1			
Orthetrum sagitta Ris, 1915		NT	U	?	?					2*			

continued

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Taxa	Notes	RL	Biology			Liberian records				Neighboring areas			
			B	L	W	NL	Go	Gr	Li	SL	MN	Si	TF
Orthetrum stemmale (Burmeister, 1839)			A	O	S	A	A		1		3	1	1
Oxythemis phoenicosceles Ris, 1910			G	F	S				2				
Palpopleura deceptor (Calvert, 1899)			A	O	S		A		1!	4			
Palpopleura jucunda (Rambur, 1842)			A	O	S					1			
Palpopleura lucia (Drury, 1773)			A	O	S	S	S	S	1	1	1	1	1
Palpopleura portia (Drury, 1773)	54.		A	O	S	S	A	S	1	1	1	1	1
Pantala flavescens (Fabricius, 1798)			A	O	S	S	S	(S)	1	1	1		
Parazyxomma flavicans (Martin, 1908)			G	O	S	S			1				
Porpax bipunctus Pinhey, 1966		(VU)	G	F	?				2				1
Rhyothemis fenestrina (Rambur, 1842)			A	O	S	S	A	(S)	1	4			
Rhyothemis notata (Fabricius, 1781)			G	O	S			(A)	1	4	1		
Rhyothemis semihyalina (Desjardins, 1832)			A	O	S				2	1			
Sympetrum navasi Lacroix, 1921			A	O	S				2	3			
Tetrathemis camerunensis (Sjöstedt, 1900)	55.		G	F	S	A	A	S	1		3	1	1
Tetrathemis godiardi Lacroix, 1921			W	F	S		A	A	1		1		
Tetrathemis polleni (Selys, 1869)			A	O	S	S			1!				
Thermochoria equivocata Kirby, 1889			G	F	S				2	1	1		1
Tholymis tillarga (Fabricius, 1798)			A	O	S		A	A	1	1	1		1
Tramea basilaris (Palisot de Beauvois, 1817)			A	O	S	S	S	(S)	1	1			
Tramea limbata (Desjardins, 1832)			A	O	S	S	A	(S)	1!	1			
Trithemis aconita Lieftinck, 1969	56.		A	O	R	A	A	A	1	1	1	1	1
Trithemis africana (Brauer, 1867)		NT	U	F	R		A		1	1*			
Trithemis annulata (Palisot de Beauvois, 1807)			A	O	S				2	1	3		
Trithemis arteriosa (Burmeister, 1839)			A	O	S	A	A	S	1	1	1		1
Trithemis basitincta Ris, 1912			W	F	R		A		1				
Trithemis bredoi Fraser, 1953			N	O	S					1			
Trithemis dichroa Karsch, 1893			G	O	R				2	1	1		
Trithemis dejouxi Pinhey, 1978	57.		N	O	R				3				
Trithemis grouti Pinhey, 1961	58.		G	O	R	A	A	S	1	1	1	1	1
Trithemis hecate Ris, 1912	59.		A	O	?				3	1			
Trithemis kalula Kirby, 1900			N	O	?					1*	1		
Trithemis kirbyi Selys, 1891			A	O	S				2		3		
Trithemis monardi Ris, 1931	60.		A	O	S		A		1!	1			
Trithemis pruinata Karsch, 1899			G	F	R						1		
Trithemis stictica (Burmeister, 1839)			A	O	R				2	1			
Urothemis assignata (Selys, 1872)			A	O	S	S			1		1		
Urothemis edwardsii (Selys, 1849)			A	O	S				2	1			
Zygonyx chrysobaphes Ris, 1915			U	F	R			S	1	4*	1		
Zygonyx flavicosta (Sjöstedt, 1900)	61.		G	F	R	L	A		1	1	1		
Zygonyx geminunca Legrand, 1997	62.		U	F	R				3		1*		
Zygonyx torridus (Kirby, 1889)			A	O	R				2	1*	1		
Zyxomma atlanticum Selys, 1889			A	O	S		S	S	1				

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Notes:
1. Includes Lempert's (1988) "*Phaon* cf. *fraseri* Pinhey, 1961";
2. The author's study of type specimens of *Sapho fumosa* and *Umma infumosa* Fraser, 1951 in the Natural History Museum in London suggest the two are synonymous;
3. Formerly known as *C. sharpae* Pinhey, 1972;
4. Formerly known as *C. mutans* Legrand & Couturier, 1986, misidentified as *C. neptunus* (Sjöstedt, 1899) by Carfi & D'Andrea (1994);
5. Formerly listed as *C. glauca radix* or just *C. glauca* (Selys, 1879);
6. "*Mesocnemis* sp.nov." in Lempert (1988);
7. *C. rossii* Pinhey, 1969, treated as a good species by Legrand (2003) is considered a synonym of *C. flavipennis* by the author;
8. Formerly placed in *Isomecocnemis*;
9. Misidentified as *E. acuta* Kimmins, 1938 by Carfi & D'Andrea (1994);
10. Formerly placed in *Enallagma*;
11. Misidentified as *A. forcipata* Le Roi, 1915 by Carfi & D'Andrea (1994);
12. Single female holotype from Sierra Leone is unlike any known African species and may pertain to a mislabelling.
13. Includes *C. moorei* Longfield, 1952;
14. Formerly known as *P. angelicum* Fraser, 1947;
15. Formerly known as *P. basicornu* Schmidt in Ris, 1936;
16. Formerly known as *P. flavipes* Sjöstedt, 1899 or *P. f. leonense* Pinhey, 1964;
17. Described as *Aciagrion walteri* by Carfi & D'Andrea (1994);
18. This and the previous species probably belong to an unnamed genus;
19. Formerly known as *G. sevastopuloi* (Pinhey, 1961), identification by Carfi & D'Andrea (1994) confirmed;
20. Lempert's (1988) "*Gynacantha* sp." female could not be assigned to a known species;
21. Misidentified as "*Gynacantha* cfr. *usambarica* Sjöstedt, 1909" by Carfi & D'Andrea (1994);
22. Female published by Lempert (1988) as *H. fuliginosa*;
23. "*Diastatomma* sp. nov." in Lempert (1988);
24. Formerly known as *G. madi* Pinhey, 1961:
25. "*Lestinogomphus* sp. 2" in Lempert (1988);
26. "*Lestinogomphus* sp. 1" in Lempert (1988);
27. "*Lestinogomphus* sp. 3" in Lempert (1988);
28. Includes Lempert's (1988) "*Microgomphus* sp." females;
29. Records of *O. quirkii* Pinhey, 1964 and *O. supinus* Hagen in Selys, 1854 listed under this name, the only one for this type of *Onychogomphus* from West Africa;
30. "*Paragomphus* sp. nov. 3" in Lempert (1988);
31. Formerly known as *P. bredoi* (Schouteden, 1934) includes records by that name and "*Paragomphus* sp. nov. 2" by Lempert (1988) and misidentified as *P. cognatus* (Rambur, 1842) by Carfi & D'Andrea (1994);
32. "*Paragomphus* sp. nov. 4" in Lempert (1988);
33. "*Paragomphus* sp. nov. 1" in Lempert (1988);
34. May be the same as *P. moundi* and *P. helenae*;
35. Lempert's (1988) "*Phyllogomphus* sp." male is unlike known species;
36. Identified as *T. tenaculatus* (Fraser, 1926) by Lempert (1988);
37. Formerly known as *P. bifasciata* Martin, 1912;
38. Lempert's (1988) "*Macromia* sp. nov." is this species;
39. Formerly known as *P. funicularia* (Martin, 1907);
40. Formerly known as *Sleuthemis diplacoides* Fraser, 1951 and *Monardithemis leonensis* Aguesse, 1968;
41. Formerly mistaken for *A. biordinata* Karsch, 1899;
42. Misidentified as *C. saxicolor* Ris, 1921 by Carfi & D'Andrea (1994), old Liberian record of that species also included here;
43. Three specimens published by Lempert (1988) as *D. lefebvrii*;
44. Formerly placed in *Philonomon*;
45. Misidentified (partly) as *Lokia incongruens* by Carfi & D'Andrea (1994);
46. Several records accidentally excluded by Lempert (1988);
47. Some records may requires reexamination following confusion with *M. zygoptera*;
48. Formerly placed in *Eothemis*;
49. Formerly placed in *Allorrhizucha*, probably misidentified as *Neodythemis scalarum* Pinhey, 1964 by Legrand (2003);
50. Formerly placed in *Allorrhizucha*;
51. All western African specimens of *N. farinosa* (Förster, 1898) examined by author pertained to *N. pujoli*;
52. Single Liberian female among material not noted previously by Lempert (1988);
53. Identification by Carfi & D'Andrea (1994) confirmed;
54. *P. lucia* and *P. portia* were not separated by Lempert (1988), but both present in material;
55. Includes *T. bifida* Fraser, 1941;
56. Misidentified as *T. bifida* Pinhey, 1970 and *T. basitincta* by Carfi & D'Andrea (1994);
57. "*T. donaldsoni* (Calvert, 1899)" in Lempert (1988);
58. Formerly known as *T. atra* Pinhey, 1961, misidentified as *T. nuptialis* Karsch, 1894 by Carfi & D'Andrea (1994);
59. Identification by Marconi & Terzani (2006) confirmed, Lempert's (1988) "*T.* cf. *hecate*" is probably also correct;
60. Includes *T. imitata* Pinhey, 1961;
61. Includes *Z. fallax* (Schouteden, 1934);
62. Lempert's (1988) "*Zygonyx* sp." may be this species, but the specimen is lost.

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Appendix 3

Locality list and short description of habitats investigated in North Lorma National Forest/ Wologizi (WOL), Gola National Forest (GO) and Grebo National Forest (GRE).

Annika Hillers and Mark-Oliver Rödel

Site	Latitude (N)	Longitude (W)	Date	Description
WOL1	8°01.741'	9°44.119'	20.11.2005	Primary forest with small stream
WOL2	8°01.929'	9°44.161'	20.11.2005	Dry primary forest on hill above big river
WOL3	8°01.434'	9°44.414'	21.11.2005	Primary forest, one part slightly swampy area, other part brook, next to big river
WOL4	8°01.523'	9°44.226'	21.11.2005	Dry forest over river, many lianas, thick undergrowth
WOL5	8°02.043'	9°43.970'	22.11.2005	Forest around stream with rocks and stones, further in forest sandy, and slightly swampy area with temporary puddles
WOL6	8°02.023'	9°44.143'	22.11.2005	Forest over river, on one side stream with small waterfall, many shrubs and bushs
WOL7	8°02.509'	9°43.682'	23.11.2005	Dry forest with big rocks and stones
WOL8	8°02.391'	9°43.750'	23.11.2005	Swampy area in forest, with Raffia and Marantaceae, partly open canopy
WOL9	8°01.722'	9°44.124'	24.11.2005	Forest with streams and partly swampy area
GO1	7°27.178'	10°41.522'	28.11.2005 & 1.12.2005	Hilly primary forest with stream, stream with rocks and sand
GO2	7°27.272'	10°41.548'	29.11.2005	Dry forest on hill, with some rocks
GO3	7°27.376'	10°41.736'	29.11.2005 & 1.12.2005	Old diamond mines and ponds within forest, partly open area, and forest around this area
GO4	7°27.293'	10°41.632'	29.11.2005	Dry forest on hill
GO5	7°27.352'	10°41.483'	30.11.2005	Valley within forest with small brook, partly swampy area and forest around, partly on hill
GO6	7°26.781'	10°39.063'	2.12.2005	Big pond near SLC village
GO7	7°26.404'	10°39.150'	2.12.2005	Small pond next to big river Mano, with stones and a few trees
GRE1	5°24.108'	7°44.011'	7.12.2005	Mature secondary forest, partly thick undergrowth, with sandy stream and temporary puddles
GRE2	5°24.358'	7°44.106'	8.12.2005 & 10.12.2005	Swampy area in forest with small stream, with many treefall gaps and lianas, forest around the swampy area
GRE3	5°24.535'	7°44.276'	8.12.2005	Dry forest
GRE4	5°24.285'	7°43.786'	9.12.2005	Swampy area within secondary forest near stream with many lianas and shrubs, thick leaf litter coverage
GRE5	5°24.334'	7°43.631'	9.12.2005	Dry forest on hill
GRE6	5°23.857'	7°42.536'	10.12.2005	Big pond next to old logging road in mature secondary forest
GRE7	5°24.083'	7°42.892'	10.12.2005	Pond next to old logging road in mature secondary forest
GRE8	5°24.286'	7°42.954'	10.12.2005	Small pond next to old logging road in mature secondary forest
GRE9	5°24.127' & 5°23.827'	7°43.965' & 7°44.160'	9.12.2005 & 11.12.2005	On or next to old logging road in mature secondary forest

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