

1 **An analysis of Species Conservation Action Plans in Guinea**
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25

26 **Abstract**

27 To achieve conservation success, we need to support the recovery of threatened species. Yet,
28 <5% of plant species listed as threatened on the IUCN Red List have Species Conservation
29 Action Plans (CAPs). If we are to move from a Red List to a Green List for threatened plant
30 species, CAPs need to be devised and implemented. Guinea is one of the most botanically
31 diverse countries in West Africa. Recent research found that nearly 4000 vascular plants
32 occur in Guinea, a 30% increase from previous estimates. 273 of these plant species are now
33 assessed as threatened with global extinction. There is increasing pressure on the
34 environment from the extractive industry and a growing population. In parallel with
35 implementation of an Important Plant Area programme in Guinea, CAPs were developed for
36 20 threatened plant species. These plans elaborate conservation efforts needed first to
37 safeguard threatened species both *in situ* and *ex situ* and then to support their recovery. We
38 document the approach used to assemble the Species Conservation Action Plans, and we
39 discuss the importance of having up to date field information, IUCN Red List assessments,
40 and use of a collaborative approach. The need for these plans is increasingly important with
41 recent calculations suggesting a third of African plants are threatened with extinction. This
42 paper outlines initial detailed plant conservation planning in Guinea and offers a template for
43 conservation practitioners in other tropical African countries to follow.

44

45 **Key words:** Important Plant Areas, IUCN Red List, Species Conservation Action Plans,
46 Guinea, threatened species.

47 **Introduction**

48 The goal of conservationists is to protect globally threatened species and achieve success
49 through species recovery, eventually recording this on the Green List (Akcakaya et al. 2018).
50 Yet, of the 15,774 threatened plant species treated on the global Red List, only 753 (4.78 %)
51 are reported to have Species Conservation Action Plans (CAPs) in place (IUCN 2019). To
52 help address this massive deficit, we offer an approach to developing CAPs for threatened
53 plant species which has succeeded in Guinea (West Africa), as a template for conservation
54 practitioners in other Tropical African countries.

55 Guinea is one of the most botanically diverse countries in West Africa. It has nearly
56 4000 vascular plant species (G. Gosline et al. unpubl. data), a significant increase from the c.
57 3000 listed in the *Flore (Angiospermes) de la République de Guinée* by Lisowski (2009).
58 This increase reflects an extensive searches over the last five years to inventory the flora of
59 Guinea through the digitisation and georeferencing of historical herbarium records
60 (Magassouba et al. 2014, GBIF 2019) complemented by targeted field expeditions to
61 understudied areas of Guinea by the National Herbarium of Guinea (HNG) and the Royal
62 Botanic Gardens, Kew (RBGK) (Cheek et al. 2018a). As a result of efforts to find additional
63 localities for rare species, we determined at least one likely extinction (*Inversodicraea*
64 *pygmaea* G.Taylor) due to a hydroelectric dam (Cheek 2018c). A total of 74 published
65 endemic species have been recorded for Guinea, all of which are threatened (G. Gosline et al.
66 unpubl. data, Rokni 2017, 2018, Larridon 2018). Recent estimates of endemism for Guinea
67 ranged from 2.6% (Lisowski, based on a species list) to 4.7% (Sosef et al. 2017 inferred from
68 the RAINBIO dataset. The number of endemic species is set to increase with recent
69 discoveries; several descriptions of new species to science are in progress. The comparatively
70 high plant diversity in Guinea is in part due to the highland areas found in the central and
71 eastern parts of the country. The central Fouta Djallon highlands have many endemic plant

72 species found in a variety of habitats such as sandstone cliffs, sandstone and lateritic bowal
73 (treeless hardpan), and submontane forest (Couch et al. 2019a). However, over past centuries
74 this area has undergone a dramatic change with the expansion of cattle ranging and
75 development of agricultural systems. The submontane forest has become extremely degraded
76 and intact submontane forest has practically disappeared over all of the Fouta Djallon. A
77 recent three year project to identify Tropical Important Plant Areas in Guinea (Couch et al.
78 2019a) showed that of 35 threatened species not seen for 60 years or more, and not
79 rediscovered during the project, 25 are globally endemic to Guinea and the majority occur in
80 the Fouta Djallon. The Fouta Djallon historically shared some species with the mountain
81 chains of Simandou and Nimba in eastern Guinea, such as *Habenaria jaegeri* Summerh. and
82 *Kotschya lutea* (Portères) Hepper. Both species are likely to be locally extinct in the Fouta
83 Djallon, as they have not been seen despite targeted searches there for 57 and 82 years
84 respectively.

85 The Tropical Important Plant Areas (TIPAs) of Guinea project recently identified nine
86 threatened habitats and 22 TIPAs (Couch et al. 2019a, Couch et al, 2017). TIPAs are assessed
87 using three criteria: the presence of (1) Threatened species, (2) Botanical richness (including
88 socio-economic species), and (3) Threatened habitats (Darbyshire et al. 2017). Each TIPA
89 assessment also documents past, present and future threats as well as the current protection
90 given to the proposed TIPA site. A variety of threats imperil the flora of Guinea, not least
91 from the mining sector. Guinea is one of the leading exporters of bauxite, producing 95% of
92 African bauxite and 15% of the global share, based on tonnes exported (Alcircle, 2018). It
93 also has considerable reserves of iron ore, gold and diamonds, with smaller reserves of other
94 minerals including nickel, copper, cobalt, manganese and uranium (Guinean Ministry of
95 Mines and Geology, 2016). However, for many of the habitats, in particular the lowland
96 evergreen forest and submontane forest (including gallery forest), the main threats are the

97 unsustainable slash and burn agricultural practices and the cutting of wood for charcoal. A
98 study by Sayer et al. (1992) documented that 96% of original forest had already disappeared
99 from Guinea. In the bowal areas, the main threats are from cattle-ranging and linked
100 management practices causing increases in fire frequency, and from housing development.

101 New large-scale projects, for example in the mining sector and for hydroelectric
102 power, require companies to carry out detailed Social and Environmental Impact
103 Assessments (SEIAs). These studies should highlight threatened plant species in their
104 concessions. Until now, only 7% of all plant species have been assessed globally for the
105 IUCN Red List (Bachman et al. 2019), including c. 5% of the Guinean flora, making it
106 difficult for environmentalists to demonstrate that protection or mitigation is needed. A
107 GBIF-BID funded project (reference number AF2015-0042-NAC) entitled ‘Towards a Red
108 Data Book for Guinea’ in collaboration with the Darwin Initiative funded TIPAs project
109 (Darwin Project 23-002), has assessed c. 200 plant species from Guinea (using the IUCN
110 2012 guidelines). This is a considerable achievement. However, the review and publishing
111 process of IUCN Red List assessments are time-consuming. These delays were accentuated
112 because until recently there was no IUCN specialist group available to review most West
113 African plant assessments. In June 2019, the West Africa Plant Red List Authority
114 (WAPRLA) was accepted by the IUCN Species Survival Commission. It is expected that the
115 new RLA will reduce the delays in publication of IUCN Red List assessments of West
116 African plants and will also unite plant conservation efforts and promote red listing across the
117 West African region. A preliminary list of threatened plant species for Guinea was published
118 in PeerJ Preprints in 2017, and updated over the course of the projects described above
119 (Couch et al. 2019b) to keep conservation practitioners up to date ahead of the publication of
120 a full plant Red Data Book for Guinea 2020. This will also feed into updating the
121 *Monographie Nationale* (Guinea’s National Biodiversity Management Action Plan) which

122 has not been revised since 1997. As part of the red listing process, ongoing and required
123 conservation actions are recorded. However, these are high level actions with little or no
124 detail generally given.

125 As part of the GBIF-BID ‘Towards a Red Data Book for Guinea’ project, and as a
126 first step towards detailed plant conservation planning in Guinea, individual Species
127 Conservation Action Plans were developed for 20 plant species assessed as Critically
128 Endangered (CR), Endangered (EN) or Vulnerable (VU). These plans document the
129 conservation efforts needed to safeguard each of these threatened species both *in situ* and *ex*
130 *situ*.

131 In this paper, we outline the approach used to assemble the Species Conservation
132 Action Plans, and we discuss the importance of having up to date species field information
133 and IUCN Red List assessments. We also discuss the advantages of a collaborative approach
134 and outline the next stages for implementing these species action plans on the ground in
135 Guinea.

136

137 **Materials and Methods**

138 Several points need to be considered before a Species Conservation Action Plan can be
139 written. Firstly, who should be involved in this process? To address this and the assessment
140 of the Tropical Important Plant Areas, a joint working group on TIPAs and Conservation
141 Action Plans (CAPs) was formed in May 2018. The working group consists of
142 representatives from the National Herbarium of Guinea (HNG), the Royal Botanic Gardens,
143 Kew, UK (RBGK), the Guinean Ministry of Environment, Water and Forests (MEEF), the
144 National Parks and Reserves office (MEEF-OGuiPAR), the Centre for Biological
145 Observations and Monitoring (MEEF-COSIE), environmental NGOs Guinée Ecologie (GE)
146 and Protection et Gestion de l’Environnement (PEG), the Centre for Environmental Research

147 Studies at the Université Gamal Abdel Nasser de Conakry (UGANC-CERE), and the Sereidou
148 Herbarium (Institut de Recherche Agronomique de Guinée (IRAG) acronym SERG). This
149 was the first time that these organisations had united to support the prioritisation of
150 threatened plant conservation in Guinea. The working language of the group is French. The
151 working group meets every 2 months and conducts business over email inbetween meetings,
152 discusses and agrees what should be included in the CAPs and which designated members are
153 to be charged with collating the information and writing the plans.

154 The protocol for preparing the conservation action plans was developed and approved
155 by the working group (available on the National Herbarium of Guinea website) and was
156 based in part on the *Conservation Action Planning Handbook* by The Nature Conservancy
157 (TNC 2007). The format and style of the Conservation Action Plans drew upon previously
158 drafted species recovery plans for non-Guinean taxa (e.g. JNCC UK priority species pages
159 2010a, 2010b, Panjabi et al. 2011) together with constant from conservation actions
160 identified in the IUCN Red List process.

161 A shortlist was drawn up by the HNG and RBGK members of the group from the preliminary
162 list of threatened species of Guinea (Couch et al. 2019b). Twenty species were chosen that
163 meet the following selection criteria: 1) listed as CR, EN or VU in the preliminary checklist,
164 2) have a published or reviewed IUCN Red List assessment, 3) cover a range of life forms,
165 and 4) are found over a range of threatened habitats. The decision to prepare CAPs only for
166 species with formal IUCN assessments was made in part because there is more information
167 available for these species, but also because their assessed conservation status was unlikely to
168 change in the near future. With species that have yet to be formally assessed or reviewed
169 there is the risk that the IUCN Red List status may change. The species chosen included a
170 mixture of life forms i.e. trees, shrubs, lianas and herbs (Table 1).

171 With the protocol drafted and the short list of species agreed, two members of the group took
172 the lead on collating species information and drafting the plans. All members of the group
173 contributed to review and refinement of the plans. This work took place over a period of 9
174 months and involved an estimated 152 person working days.

175 The first part of each CAP sets out the context for each species. It is imperative that
176 each species is properly researched and clearly circumscribed based on sound taxonomy. This
177 is especially necessary since any existing documentation, particularly in Guinea, is often out
178 of date. Until recently, there was little published on the Guinean flora. The *Flore*
179 (*Angiospermes*) *de la Guinée* by Lisowski, was published posthumously in 2009, with
180 taxonomy not updated since Lisowski submitted it for publication in 2000. As a result, many
181 names in Lisowski's *Flore de la Guinée* are out of date (Cheek et al. 2015), and since its
182 publication about 20 newly discovered species (e.g. Cheek & Haba 2016, Cheek et al. 2018b)
183 and many new range extensions have been recorded in Guinea. Where a recently discovered
184 species was chosen for a CAP, the protologue (original scientific publication) has been used
185 as the source for the taxonomic information. Names have been checked against the African
186 Plant Database (2019), the International Plant Names Index (2019) and Plants of the World
187 Online (2019). Descriptions of the plant species were taken from either Lisowski (2009), the
188 *Flora of West Tropical Africa* (Keay & Hepper 1954-72) or the protologue. Details about the
189 ecology, phenology and habitat where known, have also been documented.

190 The working group decided that each CAP should include as much information as is
191 available for the species including i) past and present collection data, this information has
192 largely been collated from herbarium specimen label data and species accounts in the works
193 cited above. If the species is known to be used by people, these uses are also documented; ii)
194 geographical distribution, particularly within Guinea to focus conservation efforts and, iii)
195 where known, the number of individuals in the population. Specimen-based distribution maps

196 for each species have been produced based on records collected for the Red Listing
197 programme, examples can be seen in Fig. 1. Distribution maps were made using ArcGIS Pro
198 software with simple XY coordinates uploaded and mapped onto a world basemap.

199 Information on threats both past and present, direct and indirect, is listed. This
200 information was gathered partly through literature but also during recent fieldwork. As part of
201 the Darwin Initiative funded project on Tropical Important Plant Areas in Guinea 2016-2019,
202 over 20 field expeditions were carried out targeting rare species and priority threatened
203 habitats. These field expeditions were invaluable to gather current information on rare
204 species, their distribution and uses, and on the current threats.

205 The second part of the CAP document sets out a summary plan for the management
206 and conservation of the species based on current knowledge. The first section, of the second
207 part, details all known research or suggests what research is required. *In situ* and *ex situ*
208 conservation actions are then proposed for the protection of the species.

209 *In situ* conservation actions detail any protected areas in which the species is currently
210 found, and whether the species is found within any of the newly designated Tropical
211 Important Plant Areas (Couch et al. 2019a). The total size of the population and details of the
212 sites where the species is found are recorded so that these data can be presented to the local
213 authorities and ultimately support the legal protection of the sites and species. The CAP also
214 emphasises that this documentation process must always be undertaken with support from
215 local communities especially when a species (sub)population occurs within a community
216 forest or sacred forest or in an area outlined for housing development, e.g. as is the case for
217 *Vernonia djalonensis* A.Chev. Without community support, conservation efforts will have
218 little long-term effect on the survival of species on the ground.

219 *Ex situ* conservation actions focus on the propagation of the species outside its range,
220 seed collection and banking where applicable, and the potential for translocation to another

221 protected area or botanical garden. The results of any experiments previously completed are
222 also documented. Each CAP also recommends sensitization of the local population to the
223 importance of plant species conservation and to the protection of the national plant heritage
224 of Guinea.

225

226 **Results**

227 Of the twenty CAPs produced (see Online Resources 1-20), 11 are for species endemic to
228 Guinea; this represents 15% of the total 74 published endemic plant species of Guinea. The
229 threats to the CAP species vary. All species have one or more associated threats. Fig. 2 shows
230 the percentage of species per threat type. The threats affecting most CAP species are
231 uncontrolled fires (75%), mining or quarrying (60%) and infrastructure / urbanisation (50%).
232 Two of the species are directly threatened by pollution and all of the woody species (9) are
233 threatened by deforestation or clearance of habitat through slash and burn agriculture, which
234 is also a threat to 40% of the CAP species overall.

235 Nine of the twenty CAP species are found in a current protected area and all of the
236 species are found within one or more of the newly designated TIPAs (Couch et al. 2019a).
237 However, these protected areas either lack management plans or have management plans
238 which are outdated. Within these management plans, specific species conservation actions,
239 especially for plants, are usually absent.

240 Eight of the CAP species have seed collections made and banked at the Simfer base in
241 the Simandou mountains or Herbiere National de Guinee, and the Millennium Seed Bank at
242 RBGK, UK, though none have reached the recommended seed banking target threshold of
243 10,000 seeds (Way & Gold 2014). Some seed collections are small because there are few
244 known individuals or individuals do not produce many seeds each season. Some species have
245 large seeds, expected to be recalcitrant, i.e. they are unsuitable for conventional seed banking,

246 the seeds dying when dried. *Talbotiella cheekii* Burgt is one such species (Burgt et al, 2018).
247 Some Rubiaceae species are also known to be recalcitrant so *Tarenna hutchinsonii* Bremek.
248 and *Keetia susu* Cheek may also prove to be unsuitable for conventional seed banking, but as
249 yet they remain untested.

250 For the majority of the CAP species no propagation information is available and so
251 experimentation will be required to fill this knowledge gap. However, for a quarter of the
252 species propagation protocols are available, due to their association with a mining project.
253 These protocols were researched at RBGK using a variety of methods, e.g. micropropagation
254 for *Habenaria jaegeri* (Cheek 2017), and cuttings for *Tarenna hutchinsonii* (Cheek et al
255 2015) and *Marsdenia exellii* C.Norman (Cheek 2013).

256 Currently, only five of the 20 species have been identified as suitable for potential
257 reintroduction. Two transplant experiments have already been carried out with *Eriosema*
258 *triformum* Burgt. Transplantation of tubers, from the Simandou mountains to Mt Béro in May
259 2012, was unsuccessful as the tubers were mostly eaten by squirrels and rock hyrax, and
260 ultimately, all died (Cheek et al, 2017). Translocation of *Eriosema triformum* seed to the Mts
261 Nimba Strict Nature Reserve and also to Mt Tibe was attempted in April 2019. Results of
262 these transplants are to be evaluated in 2020 (X. van der Burgt, pers. comm.). Rhizomes of
263 *Stylochaeton pilosus* Bogner were successfully translocated in 2013 (C. Couch, pers. obs.).

264

265 **Discussion**

266 The BID-GBIF funded project “Towards a Red Data book for Guinea” and the Darwin
267 Initiative funded project identifying “Tropical Important Plant Areas of Guinea” have the
268 attracted attention of both national and international audiences to the threatened and unique
269 plant species of Guinea. The Species Conservation Action Plans resulting from these projects
270 are the first to be written for threatened plant species in Guinea and are a result of the

271 collaboration between the HNG, RBGK, Guinean government departments and NGOs
272 focussed on plant conservation. The partnerships and expertise on plant conservation built
273 during these projects did not previously exist. Conservation of endemic and near-endemic
274 plant species had not been on the national agenda. In contrast, the conservation of large
275 mammals such as the chimpanzee have had high levels of attention (Sugiyama & Soumah
276 1988, Brugière et al. 2005, Fleury-Brugière & Brugière 2010, Humle et al. 2011). Following
277 the conclusion of the Darwin and GBIF-BID projects in March 2019, the working group has
278 continued to collaborate to address, review and update 1) Guinea's CITES list and 2) the
279 second edition of the Guinean National Biodiversity Action Plan. The collaboration has
280 gained support from all sectors concerned with plant conservation and together with the
281 recently identified Tropical Important Plant Areas (Couch et al. 2019a), it is pushing plant
282 conservation in Guinea further up the national agenda. To the best of our knowledge this is
283 the first time that a programme of plant conservation action plans for globally threatened
284 plant species has been devised and acted upon in a West African country.

285 The 20 Species Conservation Action Plans have highlighted the importance of fieldwork to
286 provide up to date information on the target species. IUCN Red List assessments can be
287 written based on literature and herbarium records, but knowing the current status of a
288 population and the real threats that they face is invaluable when writing a CAP. The CAPs
289 draw on fieldwork undertaken over the past 10 years, largely by HNG and RBGK.

290 Implementation of these plans will need further action. One of the plans, for *Vernonia*
291 *djalonensis* (Online Resource 19), was the basis of a successful funding bid to the
292 Mohammed bin Zayed Species Conservation Fund and is being used to guide on-the-ground
293 conservation actions for this species, which was recently elected as the national flower of
294 Guinea (Couch 2018). We have engaged with the local authorities and local plant nurseries to

295 protect and propagate this species. In early 2020, we are planning to engage with students and
296 youth groups.

297 There is a growing need for documentation on the plants of Guinea, not only because there
298 has been so little published, but also because much of the documentation is out of date. The
299 need for national scale CAPs for individual priority species is ever more important as original
300 habitat is lost due to human activities. One in five of the world's plant species were reported
301 as threatened (RBG Kew 2016), and Stévant et al. (2019) infer that one in three African plant
302 species are at risk of extinction. With 96% loss of original forest reported in 1992 (Sayer et
303 al. 1992), many of Guinea's most threatened plant species need tailored CAPs if they are not
304 to follow *Inversodicraea pygmaea* into global extinction.

305 Guinea has over 270 threatened species of which 74 are endemic. Given the person
306 hours required to write 20 CAPs for threatened species, some endemic species might be more
307 effectively treated by local area action plans, for example based on the 22 identified TIPAs,
308 provided they adequately cover the species encompassed (Monteiro et al. 2018). Broader
309 action plans for example a comprehensive action plan that treats all Guinean threatened tree
310 species might be more effective than individual CAPs. This would reduce the timeframe
311 needed to develop conservation action plans enabling efficient implementation.

312 Increased development in Guinea is resulting in an increase in environmentally damaging
313 projects e.g. mining, hydroelectric dams and quarrying. However, development does not have
314 to mean wholesale destruction of the environment and global extinction of species. Good
315 management based on solid data and analysis can lead to much better industry practices.

316 Guinea's mining projects are implicated in the conservation of the plant species found in their
317 concessions, but they do not always make this data available. There is a vital need to have up
318 to date information freely available for those assessing the environmental impact of such
319 projects and the possible mitigation that can be achieved. Most of the existing conservation

320 efforts in Guinea are focussed on mammals, birds, ecosystem services, commercial trade or
321 large-scale landscape protection e.g. trans-boundary areas such as the Nimba Mountains
322 (STEWART 2008, Nganje et al. 2014, Brugière & Kormos 2008, Brugière 2012, Brugière et
323 al. 2005, Correia et al. 2010, Samoura et al. 2007). TIPAs aside, most of the currently
324 protected areas in Guinea do not overlap with concentrations of threatened plant species
325 (Couch et al. 2019a). The majority of the Classified Forests (CF) were designated for forestry
326 services, are not protected within the National Parks and Reserves network, and are
327 considered as unprotected by the Guinea Government. In those few cases where a CF is
328 considered protected, it will have a second designation e.g. ‘Reserve Intégrale’ or National
329 Park. Where management plans are in place for protected areas, these do not include
330 protection of individual threatened plant species or their specific habitats for example the
331 1995-2014 Management plan for the forest of Ziama (PROGERFOR, 1994).

332 The 20 species CAPs will be used to target plant conservation and funding, not just in
333 protected areas. They also have the potential to form the basis of conservation planning and
334 mitigation strategies for the extractive industries in those cases where project footprints
335 intersect with those of the threatened plant species. With 20 species CAPs written of 273
336 threatened species in Guinea, this is merely the beginning. On the ground implementation of
337 the 20 CAPs will assist in updating and modifying the CAP protocol to make it a useful and
338 relevant tool in future conservation planning in Guinea.

339

340 **Author Contributions**

341 Writing and compilation of supplementary materials: CC and DM; Contribution and revision
342 of CAPs: all members of the working group; Revision of content and supplementary
343 materials: XvdB, IL, MC, EL. Writing of BID funding proposal: ID, MC.

344

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356 writing IUCN Red List assessments for Guinean plant species. This work has been enabled
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358 since 2008.

359

360 **Conflicts of interest**

361 None.

362

363 **Ethical standards**

364 This research was carried out in accordance with the *Oryx* code of conduct.

365

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Tables

Table 1. List of species chosen for Conservation Action Plans. IUCN status: CR = Critically Endangered, EN = Endangered, VU = Vulnerable.

Family	Species	IUCN status	Growth form
Acanthaceae	<i>Anisotes guineensis</i> Lindau	EN	Shrub
Apocynaceae	<i>Marsdenia exellii</i> C.Norman	EN	Liana
Apocynaceae	<i>Xysmalobium samoritourei</i> Goyder	EN	Herb
Araceae	<i>Stylochaeton pilosus</i> Bogner	EN	Herb
Asteraceae	<i>Vernonia djalonensis</i> A.Chev.	CR	Herb
Bromeliaceae	<i>Pitcairnia feliciana</i> (A.Chev.) Harms & Mildbr.	CR	Herb
Cyperaceae	<i>Scleria guineensis</i> J.Raynal	CR	Herb
Ebenaceae	<i>Diospyros feliciana</i> Letouzey & F.White	EN	Tree
Euphorbiaceae	<i>Acalypha guineensis</i> J.K.Morton & G.A.Levin	VU	Herb
Lamiaceae	<i>Plectranthus linearifolius</i> (J.K.Morton) B.J.Pollard & A.J.Paton	EN	Herb
Leguminosae-Detarioideae	<i>Talbotiella cheekii</i> Burgt	EN	Tree
Leguminosae-Papilionoideae	<i>Pterocarpus erinaceus</i> (DC.) Polhill & Wiens	EN	Tree
Leguminosae-Papilionoideae	<i>Eriosema triformum</i> Burgt	CR	Herb

Melastomataceae	<i>Cailliella praerupticola</i> Jacq.-Fél.	EN	Shrub
Orchidaceae	<i>Habenaria jaegeri</i> Summerh.	EN	Herb
Podostemaceae	<i>Inversodicraea pepehabai</i> Cheek	EN	Herb
Rubiaceae	<i>Keetia susu</i> Cheek	EN	Shrub/Tree
Rubiaceae	<i>Tarenna hutchinsonii</i> Bremek.	CR	Shrub/Tree
Rutaceae	<i>Vepris felicis</i> Breteler	CR	Shrub
Sapotaceae	<i>Tieghemella heckelii</i> (A.Chev.) Pierre ex Dubard	EN	Tree

Figure legends

Fig. 1 Species distribution maps for four endemic Guinean species. **A** *Anisotes guineensis*, **B** *Talbotiella cheekii*, **C** *Diospyros feliciana*, and **D** *Eriosema triformum*.

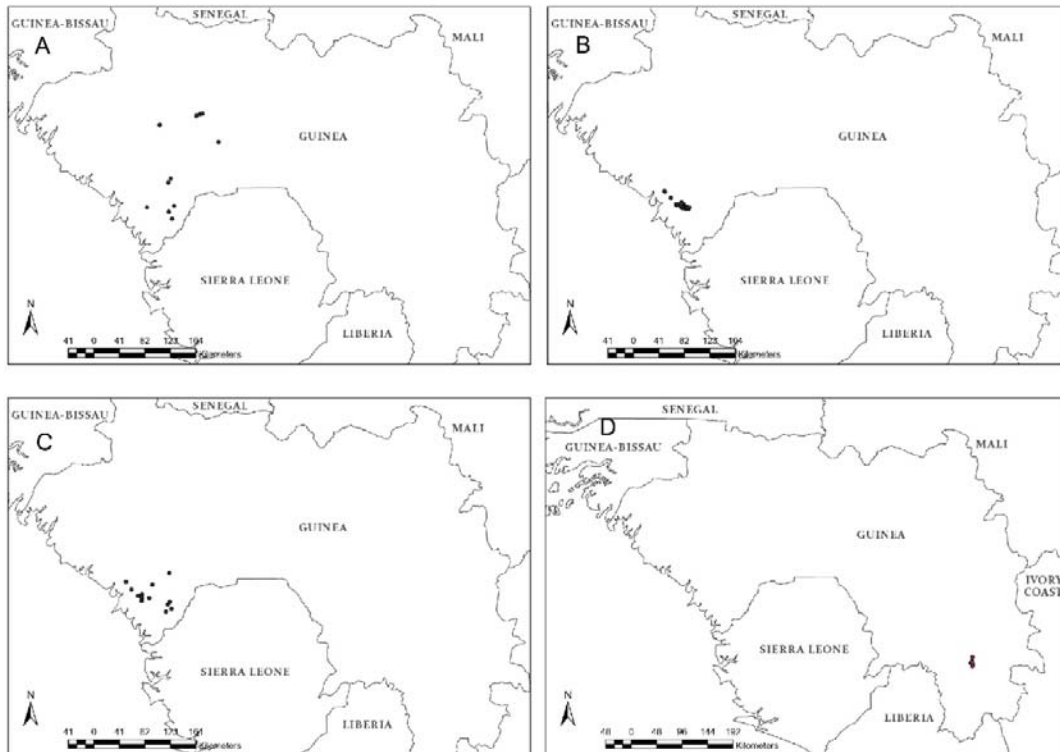
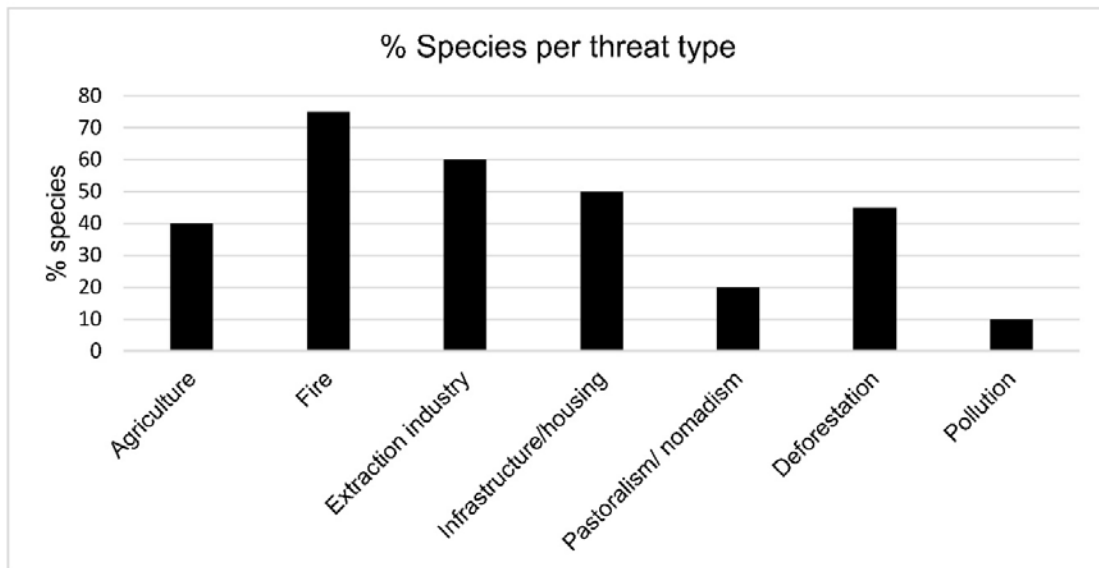


Fig. 2 Graph showing the percentage of the 20 Conservation Action Plan species per threat type.



Supplementary files

Conservation Action Plans for 20 threatened Guinean plant species can be found

following the links below:

CAP 1. *Acalypha guineensis* J.K.Morton & G.A.Levin DOI: [10.13140/RG.2.2.34363.36648](https://doi.org/10.13140/RG.2.2.34363.36648)

CAP 2. *Anisotes guineensis* Lindau DOI: [10.13140/RG.2.2.25974.75845](https://doi.org/10.13140/RG.2.2.25974.75845)

CAP 3. *Cailliella praerupticola* Jacq.-Fél. DOI: [10.13140/RG.2.2.34363.36648](https://doi.org/10.13140/RG.2.2.34363.36648)

CAP 4. *Diospyros feliciana* Letouzey & F.White DOI: [10.13140/RG.2.2.15824.87047](https://doi.org/10.13140/RG.2.2.15824.87047)

CAP 5. *Eriosema triformum* Burgt DOI: [10.13140/RG.2.2.35957.5296](https://doi.org/10.13140/RG.2.2.35957.5296)

CAP 6. *Habenaria jaegeri* Summerh. DOI: [10.13140/RG.2.2.11630.56644](https://doi.org/10.13140/RG.2.2.11630.56644)

CAP 7. *Inversodicraea pepehabai* Cheek DOI: [10.13140/RG.2.2.25052.33925](https://doi.org/10.13140/RG.2.2.25052.33925)

CAP 8. *Keetia susu* Cheek DOI: [10.13140/RG.2.2.18341.45280](https://doi.org/10.13140/RG.2.2.18341.45280)

CAP 9. *Marsdenia exellii* C.Norman DOI: [10.13140/RG.2.2.28407.78244](https://doi.org/10.13140/RG.2.2.28407.78244)

CAP 10. *Pitcairnia feliciana* (A.Chev.) Harms & Mildbr.

DOI: [10.13140/RG.2.2.21696.89609](https://doi.org/10.13140/RG.2.2.21696.89609)

CAP 11. *Plectranthus linearifolius* (J.K.Morton) B.J.Pollard & A.J.Paton

DOI: [10.13140/RG.2.2.35118.66880](https://doi.org/10.13140/RG.2.2.35118.66880)

CAP 12. *Pterocarpus erinaceus* (DC.) Polhill & Wiens DOI: [10.13140/RG.2.2.30085.50401](https://doi.org/10.13140/RG.2.2.30085.50401)

CAP 13. *Scleria guineensis* J.Raynal DOI: [10.13140/RG.2.2.23374.61767](https://doi.org/10.13140/RG.2.2.23374.61767)

CAP 14. *Stylochaeton pilosus* Bogner DOI: [10.13140/RG.2.2.36796.39049](https://doi.org/10.13140/RG.2.2.36796.39049)

CAP 15. *Talbotiella cheekii* Burgt DOI: [10.13140/RG.2.2.30164.14728](https://doi.org/10.13140/RG.2.2.30164.14728)

CAP 16. *Tarenna hutchinsonii* Bremek. DOI: [10.13140/RG.2.2.20097.81766](https://doi.org/10.13140/RG.2.2.20097.81766)

CAP 17. *Tieghemella heckelii* (A.Chev.) Pierre ex Dubard

DOI: [10.13140/RG.2.2.33519.59047](https://doi.org/10.13140/RG.2.2.33519.59047)

CAP 18. *Vepris felicis* Breteler DOI: [10.13140/RG.2.2.18420.09606](https://doi.org/10.13140/RG.2.2.18420.09606)

CAP 19. *Vernonia djalonensis* A.Chev. DOI: [10.13140/RG.2.2.15064.65289](https://doi.org/10.13140/RG.2.2.15064.65289)

CAP 20. *Xysmalobium samoritourei* Goyder DOI: [10.13140/RG.2.2.28486.42561](https://doi.org/10.13140/RG.2.2.28486.42561)