WSP

REPORT

New International Airport of Cabinda (NAIC Project) - Angola

Environmental and Social Impact Assessment - Chapter 7 - Baseline Conditions Biodiversity

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Distribution List

WSP Italia

ASGC

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7.0   BASELINE CONDITIONS – BIOLOGICAL AND ECOLOGICAL RESOURCES

This section describes the existing baseline conditions within the Project area of influence for the biological and ecological components. The Site knowledge combines the review of secondary information and "grey" literature with primary data and observation from field survey carried out by local consultants (namely, Saioz Engenharia Ambiental) along the year 2023. Field observations have added an extra value to the desktop analysis to characterize the biological and ecological elements that the site presents, as shown in the results (Results) and in the critical habitat determination (Critical Habitat Assessment) according to the IFC Performance Standards 6 (IFC PS6).

7.1   Study area identification

As part of this ESIA, two study areas have been identified considering the direct Project footprint, including related and associated facilities, the Project's Area of Influence (AoI) and potentially beyond, to provide a specific and detailed picture on biodiversity and ecological resources.

7.1.1   Regional

A biogeographic realm is a distinctive assemblage of flora and fauna species, natural communities, and environmental conditions, and it was identified to assess the species and habitats characterizing the Project's AoI.

The Project area falls entirely in the South Congolian bioregion "Western Congolian forest-savanna mosaic" (*AT13, ID ecoregion 63*)[1], located in the Equatorial Afrotropic subrealm, and is dominated by the Congolian forest and forest-savannas, extending westward from the Gulf of Guinea, and including large mangroves along the coast, as shown in Figure 1 (Burgess, et al., 2004) (Olson, et al., 2001). The flora of mangroves in Angola is richest in Cabinda, with species richness decreasing further south along the coast. The mangroves are elements that stabilize and protect the coastline and contribute to soil formation: with the deposition and capture of alluvial sediments on the fringe of the mangroves, ecological conditions are created that allow the advance of soil from the continent towards the sea. Mangroves are a resource exploited by people living in coastal areas.

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[1] https://www.oneearth.org/ecoregions/western-congolian-forest-savanna/
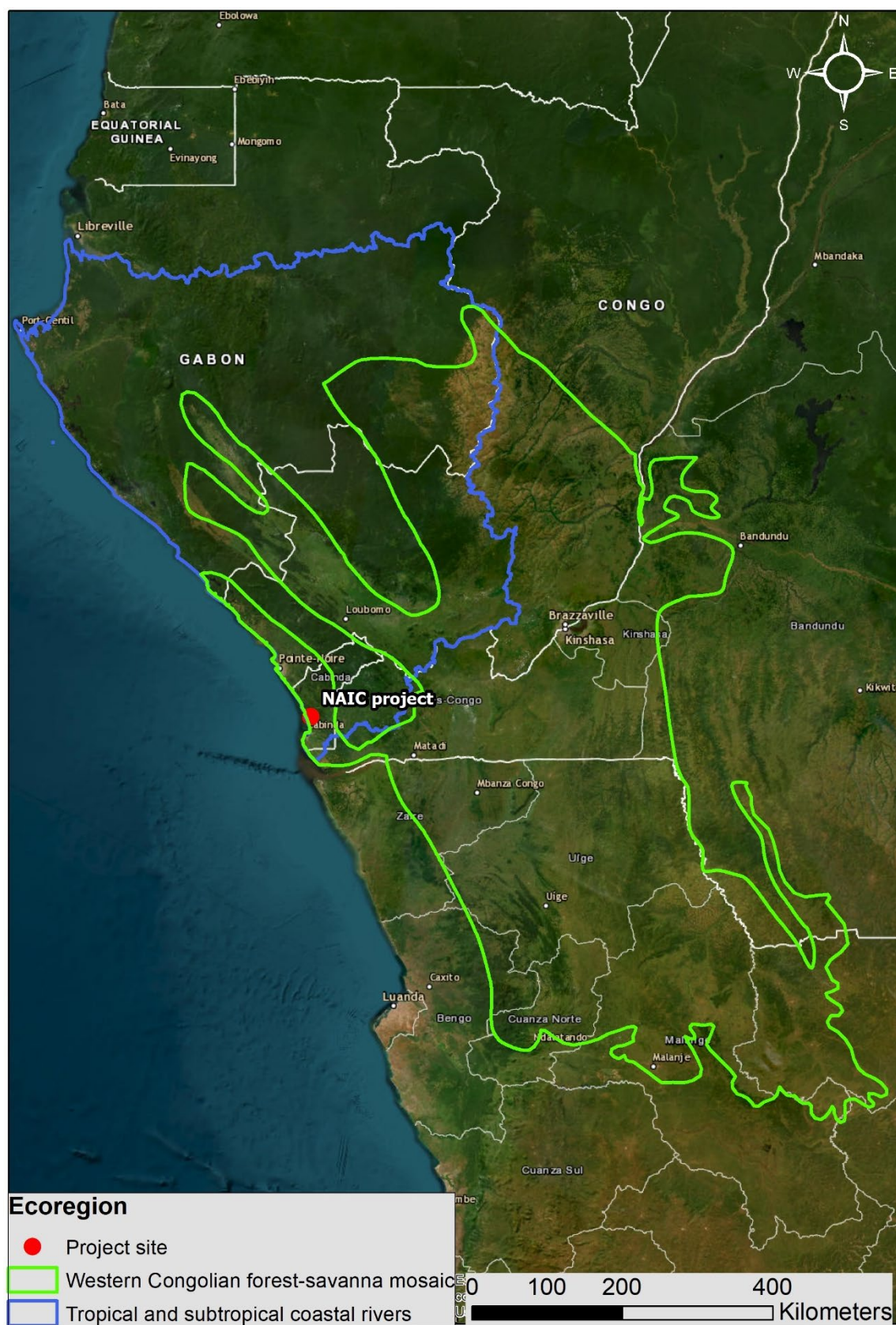
Figure 1: Terrestrial (*green area*) and freshwater (*blue area*) bioregion characterizing the Project area (*red dot*).

On the coast, Cabinda is in the Guinea Current Large Marine Ecosystem (LME), ranked among the most productive coastal and offshore waters in the world with rich fishery resources. However, pollution from domestic and industry sources, habitat destruction and poorly planned and managed coastal developments and near-shore activities are resulting in a rapid depletion of the rich fisheries resources and degradation of vulnerable coastal and offshore habitats putting the economies, productivity, and health of the populace at risk (Ukwe, et al., 2006).

In addition, the Project area is located within the "Tropical and subtropical coastal rivers (532)" [2] freshwater ecoregion (Figure 1, see above). The ecoregion extends from northern Gabon through the eastern portion of Congo and Cabinda (Angola) and ends above the Congo River Basin in Democratic Republic of Congo. Its boundaries are defined by the basins of the Kouilou-Niari and Nyanga rivers and the mainstem of the Ogooué River. The Chiloango River flows in the northern side of the Project AoI and it enters the Atlantic Ocean just north of the town of Cacongo (Figure 2). The Chiloango river as well as lake Massabi represent a significant water resource. The waters of this rainforest ecoregion are exceptionally rich in freshwater species. About one-quarter of the fish species are endemic to this ecoregion but few data are available to describe the biodiversity of this ecoregion's freshwater systems.
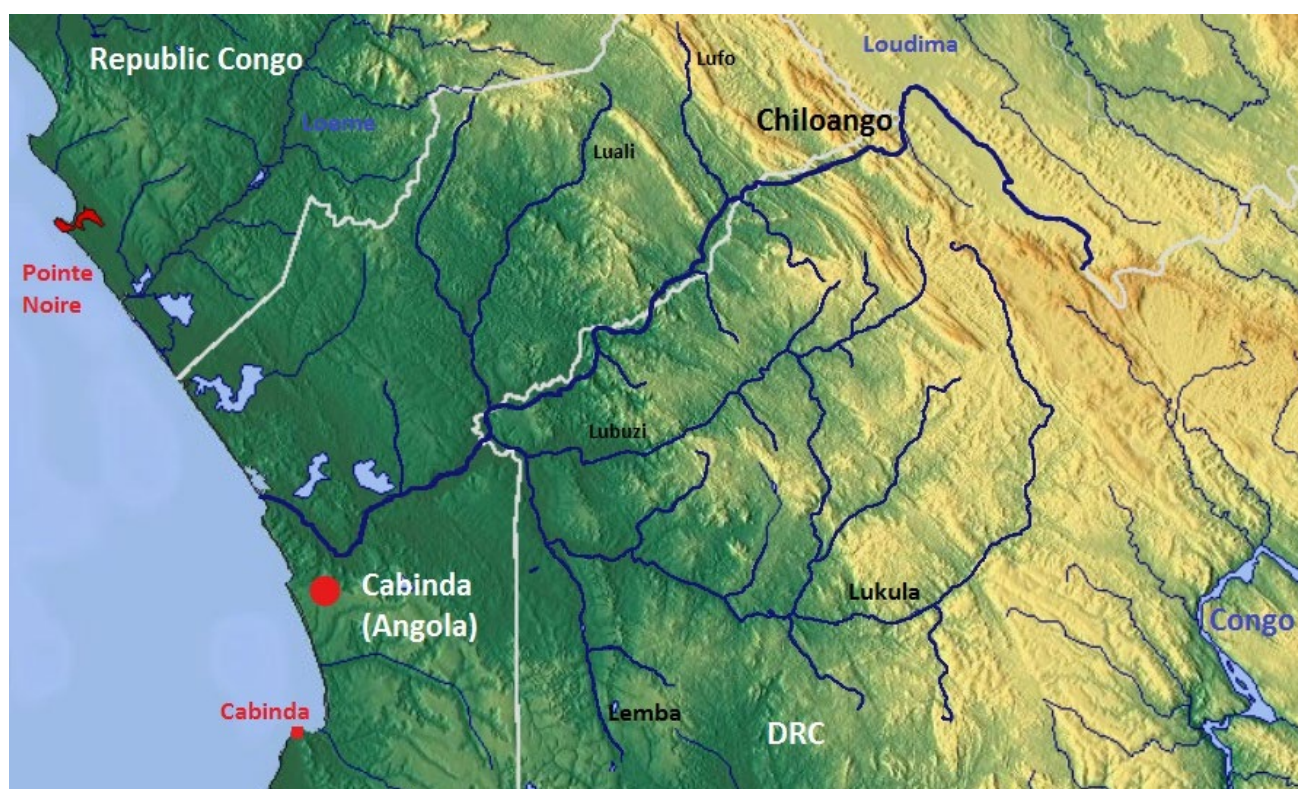
Figure 2: Main rivers and water resource in the proximity of the Project area (*red dot*).

This ecoregion, thanks to its climatic history and landscape mosaic, supports moderate species richness in all taxonomic groups and it has a medium level of biodiversity significance (Hill, et al., 2019).

Guineo-Congolian semi-evergreen forests extend many kilometers into the savanna habitats along the broad valleys of the Congo River tributaries. Ranging from closed forest (with key vegetation type genera are *Celtis* and *Albizia*) and thicket-forest mosaic (with key vegetation type genera are *Annona*, *Piliostigma*, *Andropogon* and *Hyparrhenia*) many places where the primary forest has been cleared, secondary forest or agricultural lands

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[2] https://www.feow.org/ecoregions/details/532

now occur (Barbosa, 1970). Dry grasslands predominate on sandy soils near the coast. More inland and in the north, around Koulamoutou and Lastourville, the moist forest extends interspersed with secondary forest[3]. The evergreen forests are particularly well developed in the interior of the province of Cabinda, the most emblematic and well-known case being the Maiombe Forest, which forms part of the Congo Forest, the second largest in the world, after the Amazon.

This ecoregion is among the most biodiverse forests[4], providing a multitude of ecosystem services and habitats for mammal species internationally under threat such as: African forest elephant (*Loxodonta cyclotis*), western gorilla (*Gorilla gorilla*) and chimpanzee (*Pan troglodytes*). Even if Angola is among Africa's ornithologically least-known countries it hosts the Western Angola endemic avifauna[5].

The main threat of this ecoregion comes from degradation of wildlife habitats due to subsistence farming, where close to dense urban centers woodlands are being exploited to supply charcoal to the urban market. Timber is also harvested for local use and for export, with a significant timber industry operating in the forest patches in this ecoregion. Mammal populations have been dramatically reduced in many areas due to human-wildlife conflict and hunting pressures. Logging and oil industries facilitate hunting, poaching and the trade in bushmeat of large mammals, by providing markets, transport, and access to remote forests (Mbete, et al., 2011; Lindsey, et al., 2013). Civil warfare has affected parts of this ecoregion in Angola, Republic of Congo, and DRC (Hoekstra, 2019; Butsic, et al., 2015).

The current climate is tropical with limited seasonality, and it is classified with the Köppen-Geiger climate classification as "As/Aw" subtype (*tropical savanna climate*). Cabinda's rainy season lasts from October-May and is characterized as hot and humid. The rains coincide with the warmest months of the year with average temperatures ranging from 25-27°C. The dry season, known as "Cacimbo," occurs from June-September and is the coolest time of the year, with average temperatures between 22-24°C (Figure 3). From 2000 to 2021 the average annual temperature increased from 24.91 to 25.78 °C[6].

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[3] https://www.oneearth.org/ecoregions/western-congolian-forest-savanna/

[4] Primary forest: Mature natural humid tropical forest cover that has not been completely cleared and regrown in recent history.

[5] http://datazone.birdlife.org/eba/factsheet/85

[6] https://climateknowledgeportal.worldbank.org/country/angola.
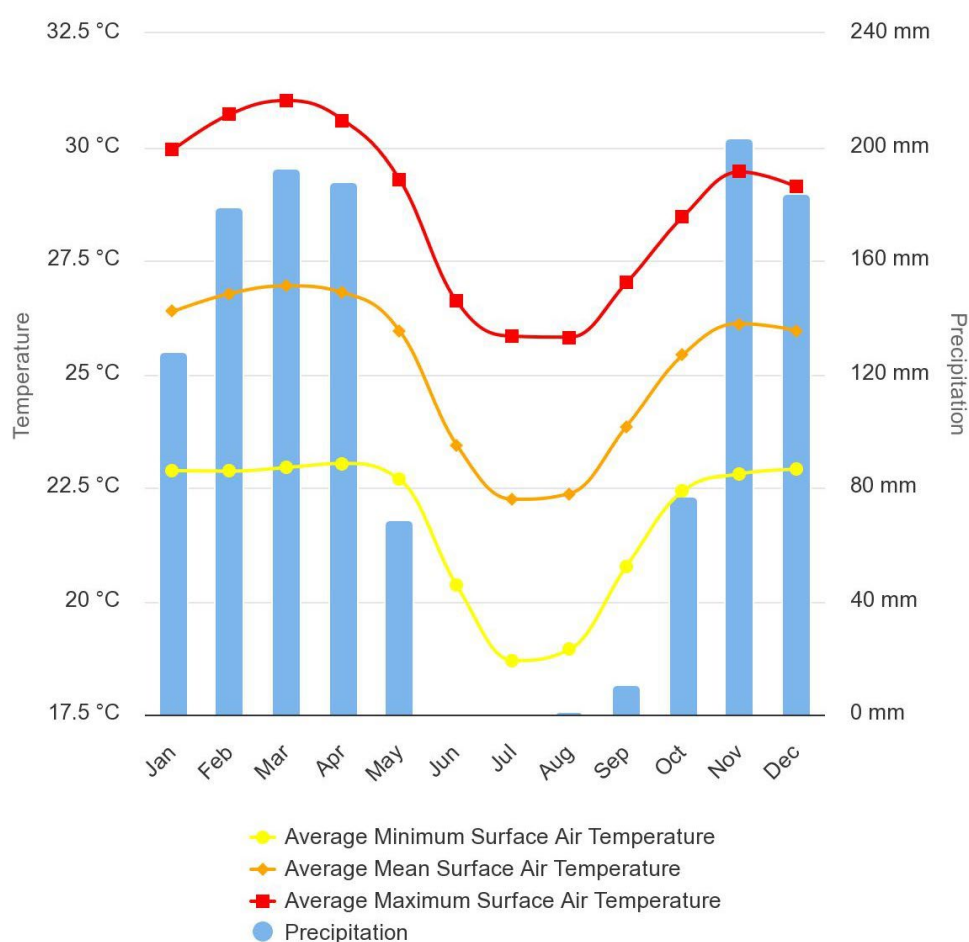
Figure 3: Monthly climatology of average surface air temperature and precipitation from 1991-2020 in Cabinda, Angola.

Precipitation is about 1324 mm per year, the driest month is July when is registered only 6 mm of precipitation, meanwhile the greatest amount of precipitation occurs in March and December, with an average of 180 and 166 mm respectively (Figure 4).[7]

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[7] https://en.climate-data.org/africa/angola/cabinda/cabinda-3481
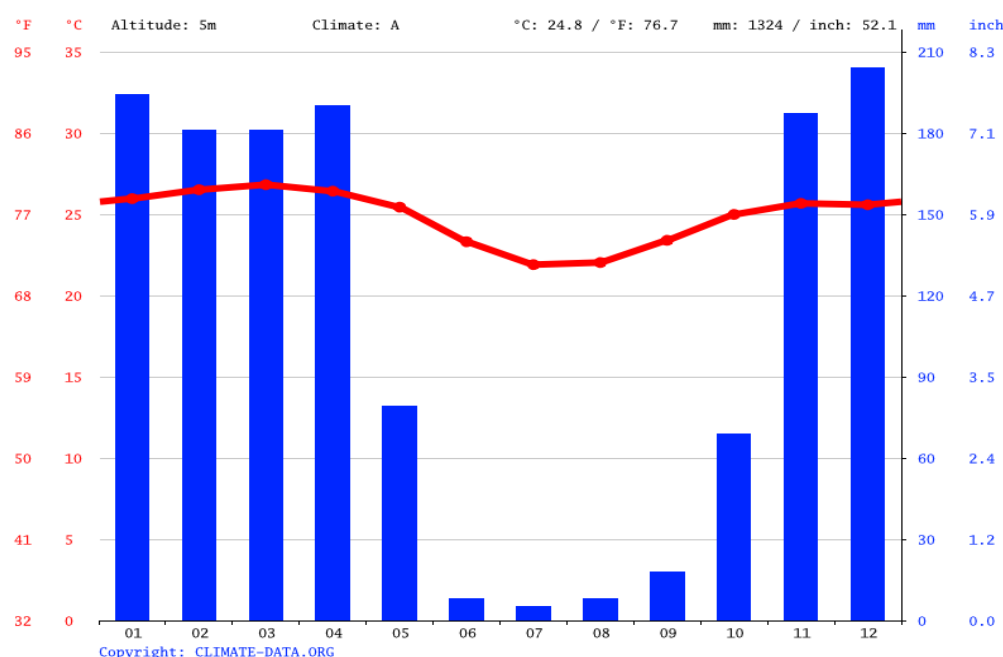
Figure 4: Monthly climatology of mean-temperature and precipitation in Cabinda.

7.1.2   Local

The biodiversity study area was identified for the Project to include all its components, and temporary facilities. For the aim of the current biodiversity baseline investigations and impact assessment, this study area is considered to correspond to the Area of Influence (AoI) for biodiversity beyond which no detectable effects are expected on the biodiversity component.

According to the IFC Performance Standard 1 "*…where the project involves specifically identified physical elements, aspects, and facilities that are likely to generate impacts, environmental and social risks and impacts will be identified in the context of the project's area of influence (AoI)*", which is defined as to encompass the following (IFC, 2012):

■   "*The area likely to be affected by: (i) the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.*"

■   "*Associated facilities, which are facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable.*"

■   "*Cumulative impacts that result from the incremental impact, on areas or resources used or directly affected by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.*"

In the light of this definition, and due to the nature of the Project, three AoI have been designed specifically at 2 km, 5 km, and 50 km (Figure 5) to carry out a solid and robust field survey and consequently the biodiversity baseline. These AoI also represents an appropriate ecological unit to support the design of a Biodiversity Management Plan (BMP) and for the Invasive Alien Species Management Plan (IASMP).

Different areas have been drawn for the assessment of Critical Habitats. Further information on the Ecologically Appropriate Area of Analysis (EAAA) defined, are available on the paragraph Critical Habitat Assessment.

Figure 5: Study Area for the biodiversity component (Area of Influence).

7.2   Methodology and approach

7.2.1   Desktop study

Before fieldwork, literature review and desktop activities were conducted. This resulted in the following:

■ Definition of a preliminary list of flora and fauna species potentially present within the project's area and its surrounding, applying reasoned buffer zones in relation to the taxa. Information on the species taxonomy, IUCN Global Conservation status, the national protection and conservation status and the global distribution of the species. Given the nature of the Projects, a good preliminary analysis has been made on wildlife migration.

■ Collection and analysis of cartographic materials to set up a preliminary habitat map of Natural and Modified habitats[8] presented within the AoI, based on the Land Cover Maps produced by the Copernicus Global Land Service (CGLS).

■ Identification of protected areas and internationally recognized areas of biodiversity importance present within 50 km from the AoI; and

■ assessment of the presence of potential Critical Habitats (CH) within the AoI.

The literature review focused on documenting available information on local and global distribution, conservation status, ecological niche, phenology, life cycle etc. of species and ecological features of conservation concern. Scientific literature and "grey" literature were considered to give an overview of the biodiversity sensitive elements potentially present in the area. The literature review considered the following sources and documents:

■ Terrestrial Ecoregions of the World (TEOW): *https://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world.*

■ Freshwater ecoregions of the world (FEOW): *https://www.feow.org.*

■ Copernicus Global Land Cover: *http://www.land.copernicus.eu/global.*

■ Google Earth Pro.

■ The Global Forest Watch: *https://www.globalforestwatch.org.*

■ Key Biodiversity Areas: *http://www.keybiodiversityareas.org/home.*

■ World Database on Protected Areas (WDPA): *https://www.protectedplanet.net/en.*

■ The IUCN Red List of Threatened Species - Version 2021-1: *https://www.iucnredlist.org.*

■ Bird Life International: *https://www.birdlife.org* and Avibase *https://avibase.bsc-eoc.org.*

■ Angola National legislation: *Environmental Framework Law, Law 5/98; National Forest Policy, Wild Fauna and Conservation Areas Resolution No. 1/10, of 14th January*; *National Strategy for Combating poverty, food and nutrition Security*; *Aquatic Biological Resources Law, Land on Lands, Water Law, Law on Territory Planning and Urbanism, Law on Environmental Protection associations*; *Convention on Biological Diversity of which Angola is a state party (CBD, CMS, CITES and CCD).*

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[8] *Natural Habitat* are defined as "areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition" (IFC 2012, PS 6.13). On the contrary, *Modified habitats* are defined as "areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition" (IFC 2012, PS 6.11).

- National Institute of Biodiversity and Conservation Areas (INBAC) established by Presidential Decree No.10/11 of 7th January to ensure the implementation of the biodiversity conservation policy and the management of the national network of conservation areas.

- 5th National Report on Biodiversity in Angola 2007-2012, Biodiversity of Angola 2019, and National Biodiversity-Strategy and Action Plan 2019-2025 Presidential Decree No. 26/20, of February 6th.

7.2.2　Habitat mapping

A preliminary habitat map (at 1:20.000 scale) was created using the Land Cover Maps (Version 3.0.1) produced by the Copernicus Global Land Service (CGLS), analyzing, and comparing data with satellite images from Google Earth and observation from the Global Forest Watch. These Land Cover Maps follow the UN-FAO's Land Cover Classification System (LCCS) which defines 23 classes: six types closed forest, six types open forest, shrub, herbaceous vegetation, herbaceous wetland, moss and lichen, bare / sparse vegetation, cultivated and managed vegetation (cropland), urban / built-up, snow and ice, permanent inland water bodies, missing data and, open sea. At this stage of the analysis, the closed forest and the open forest are of unknown type (as shown in the following Figure 6).

The habitat map will be the basis for the determination of Critical Habitat (CH) and for the definition of the likely distribution of key flora and fauna species. CH (*confirmed* or *potential*) will be identified in accordance with the criteria set out by IFC PS6 (see section 7.4).

Based on a desktop analysis, the closed and open forest patches (of unknow type) within a buffer zone of 2 km are assumed to be remnants of primary forests that is "mature natural humid tropical forest cover that has not been completely cleared and regrown in recent history" (Turubanova, et al., 2018; Anon., s.d.).

Primary forests play a crucial role in ecosystem services, including carbon sequestration, climate and water cycle regulation, and maintenance of biodiversity. Primary humid tropical forests have the highest biodiversity of terrestrial ecosystems and resulting disproportionate risk of biodiversity loss and are deemed irreplaceable in terms of conservation value (Gibson, et al., 2011; Turubanova, et al., 2018). As a result, tropical forests are a target of many policy initiatives, for example the United Nations Framework Convention on Climate Change (UNFCCC) Reducing Emissions from Deforestation and forest Degradation (REDD+) program.
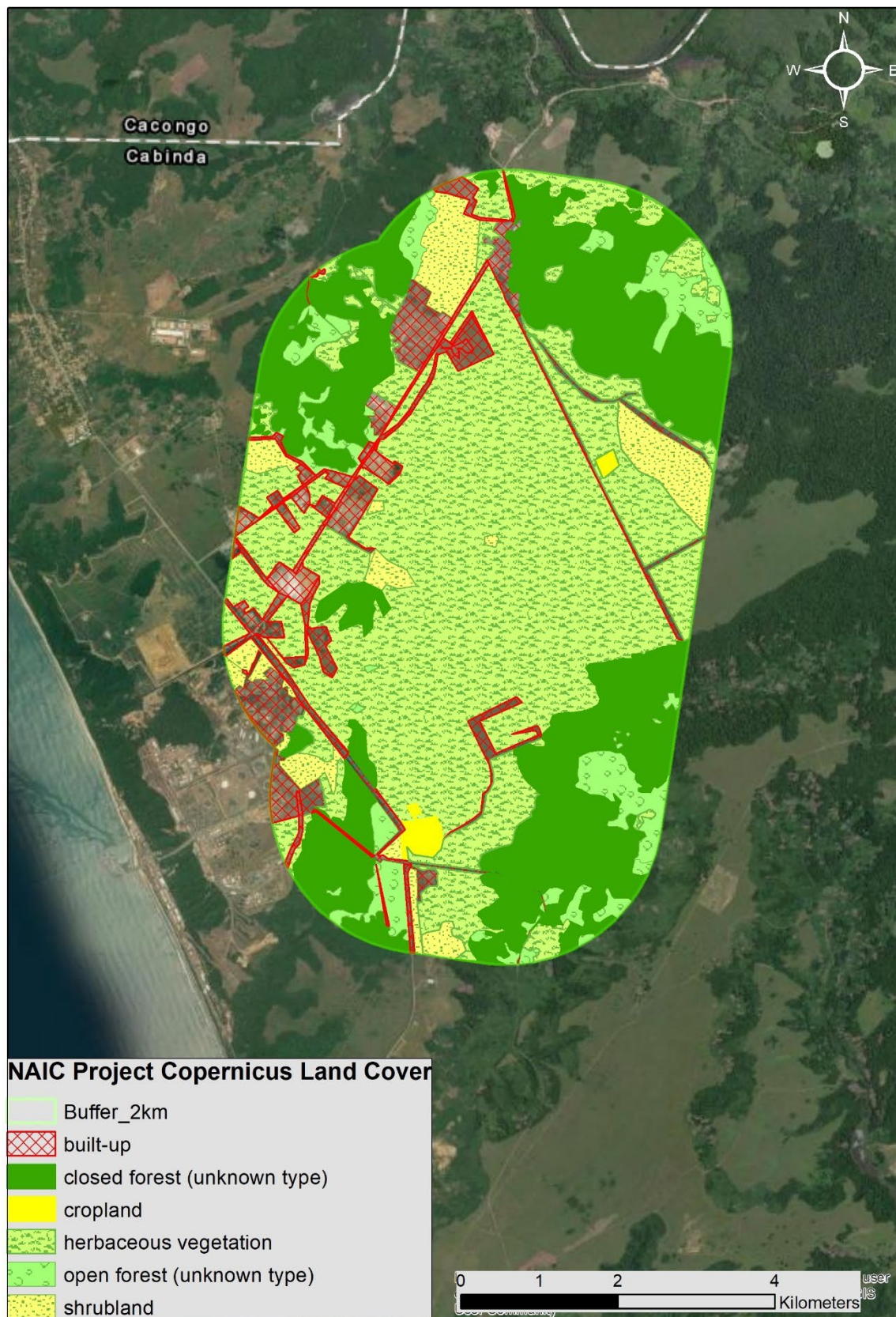
Figure 6: Preliminary habitat map with a buffer zone of 2 km.

7.2.3   Field surveys

Habitat, flora, and fauna field work was conducted through two surveys within differentiate AoI of the Project according to the ecology and ethology of the species.

The first field survey was carried out in 2023, from the end of March to the beginning of April, which corresponds to the final part of the rainy season. All the data collection was carried out by Saioz's experts under WSP direction and supervision and the results were delivered according to formats provided by WSP. An induction workshop was held on the 27th of February 2023, with all Saioz field surveyors, and the field work was carried out from the 29th of March until the 3rd of April.

The results documents are found in the folder: ANNEX A - Baseline Supporting Data, under PART 2 – Results of the Biological Baseline-Sub-part A – First campaign results.

The second field survey was carried out in 2023, between October and November, representative of the beginning of the rainy season. Based on the knowledge acquired during the first field season and the set of difficulties, from logistic to the safety of people and equipment, the second field survey was preceded by a longer planning phase (in September and during the field activities from remote), in conjunction with WSP biodiversity expert, which included the review of the methodological approach and sample design, as well as holding a series of meetings and workshops between WSP and SAIOZ experts. On the 4th and 5th October, before the technicians and equipment mobilization phase, several meetings took place with the local chiefs, local government, and authorities, to obtain permits, protection, and support during the entire survey (Figure 7). The field work started for all the biological component on the 6th of October and ended on the 22nd of October, except for the camera traps that were planned to be in place for 30 consecutive days.

The results documents are found in the folder: ANNEX A - Baseline Supporting Data, under PART 2 – Results of the Biological Baseline-Sub-part B – Second campaign results.

Figure 7: Fieldwork with armed security.

During the two field surveys, some sampling point being adjusted in the field, depending on the difficulties encountered, such as inaccessibility of locations, the presence of minefields or the possibility of armed threats.

When new points were established, it was always used a criterion of proximity and similarity of the ecological values.

The primary goal was to evaluate the baseline conditions of the biological components within different and reasoned buffer zones, to support the preparation and refinement of the habitat map and, of the lists of fauna and flora species potentially present, along with some important data, such as their habitat type, distribution, their abundance, phenology, and main threat/disturbance presence. More specifically, field surveys were conducted to:

■ verify the initial habitat types present within 2 km buffer zone, through a designed habitat screening on the field, with particular attention for the *Natural Habitats* and/or *Modified Habitats.*

■ Identify the main potential existing threats/disturbances (*e.g.*: grazing, soil erosion, dust deposition, human activities...) for habitats, the disturbance level, and the conservation status.

■ Collect data and information for flora and fauna species in differentiated buffer zones (2 km, 5 km, and 50 km), and investigate the potential presence of *Target Species*[9].

■ Estimate the vegetation cover, composition and diversity, abundance (or relative abundance), and dominance of the species, identifying the presence of threatened (*e.g.*: CR, EN and VU according to the IUCN Red List and Angola National legislation) and endemic and/or restricted range flora species, and,

■ identifying the presence of threatened (*e.g.*: CR, EN and VU according to the IUCN Red List and to Angola National legislation) and endemic and/or restricted range fauna species.

The surveys were categorized into four different categories: flora and habitat 7.2.3.10, herptile and freshwater species 7.2.3.2, birds and bats 7.2.3.3, and mammals 7.2.3.4; and it was carried out during the first field survey by two expert biologists Dr. Amândio Gomes and Dr. Isabel Luís supported by two field technicians Mr. Dealdino Lemos and Mr. Baptista Cassipeio. In the second field work, the surveys were carried out from two teams, the fauna team composed by Dr. António Bunga (fauna team leader), Mr. Timóteo Júlio and Mr. Roger Canda (fauna field assistant and expert) Figure 8; the flora team composed by Dr. Amândio Gomes (flora team leader) and Mr. Dealdino Chipita (flora field assistant and expert) Figure 9.

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[9] *Target species* are defined as: species identified as vulnerable (VU), endangered (EN) or critically endangered (CR) according to the Global IUCN Red List or according to National Red List and/or legislation, endemic (local or regional endemic) or restricted range species (EOO less than 50,000 km^2).

Figure 8: Fauna's team during the visit of the survey points and assembly of the Sherman traps for the mammals survey.

Figure 9: Flora's team during the survey of flora and habitat.

7.2.3.1   Flora and Habitat

The first field survey of Flora and Habitat was carried out between the 29th of March and 3rd April 2023, the second one between October 6th and 11th, 2023.

In situ observations were conducted starting from Survey Points, previously selected based on the desktop habitats' studies and identified at a minimum distance of 800-1000 meters and maximum distance of 2500 meters. These points were selected to ensure a representative coverage of the entire AoI (buffer 2km). The field survey was preceded by extensive bibliographical research referring to the phytogeography of the region and especially the area occupied by the Project, which had set the basis for the field work.

At each Survey Points (FLO_00) prior to the beginning of the field studies, a transect of approximately 200m was carried out in the direction of each cardinal point, to obtain a better perspective of the location, select which plot to study and at the same time maximize the chances of detecting other data of interest, such as the presence of rare species, sources of disturbance, etcetera. Upon, the surveyors have assessed habitat type and quality (with phytosociological and phyto pathological indicators) through plot surveys, with direct observation. For each habitat type a plot survey was investigated. An adequate size was chosen *in situ*, and the plot size has been large enough to represent the pattern or community to be investigated (*i.e.,* grassland 25m^2 or more accurate 5m^2) (Andrade, et al., 2019; Rejmanek, et al., 2016). A survey of the flora was also carried out, considering its stratum or form of growth (tree, shrub, herbaceous, vine or geoxylic suffrutice). To obtain the representativeness of each of the points, all species identified within a radius of 50 meters were also included, as well as others that, due to their relevance, were found in adjacent areas. Species identification was carried out in the field and at the office with the aid of credible and available guides and databases (Costa, et al., 2009; Figueiredo & Smith, 2012; Lathan, et al., 2021). Abundance/dominance was estimated according to the Braun-Blanquet scale. The conservation status of each species was determined based on the Angola Red List (LVA) and the International Union for Conservation of Nature (IUCN) Red List.

Information and coordinates (Decimal degrees, GCS_WGS_1984) of the Survey Points are reported in Table 1, and their locations are shown in Figure 10. Due to access difficulties, it was not possible to access all locations, so new points were established during the field study, using proximity and similarity of the ecological values, as a selection criterion.

Table 1: Flora and Habitat Survey Points (SPs) coordinates.

ID	Coordinates (Decimal degrees, GCS_WGS_1984)					
	Desktop pre-analysis		Fist survey		Second survey	
	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude
FLO_01	12,22582	-5,326807	12,229578	-5,389997	12,22826	-5,32675
FLO_02	12,24989	-5,332094	12,246667	-5,336667	12,24968	-5,33046
FLO_03	12,223872	-5,338912	12,225278	-5,340278	12,22517	-5,33790
FLO_04	12,24029	-5,337242	12,241389	-5,336389	12,24031	-5,33727
FLO_05	12,256569	-5,348234	12,256667	-5,348333	12,25625	-5,34814
FLO_06	12,257782	-5,332172			12,25786	-5,33205
FLO_07	12,214294	-5,350559			12,20776	-5,34210
FLO_08	12,222396	-5,368601	12,219444	-5,366389	12,22239	-5,36860
FLO_09	12,237027	-5,358723	12,236944	-5,358611	12,23712	-5,35866
FLO_10	12,229089	-5,364322	12,229167	-5,364444	12,22910	-5,36431

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| ID | Coordinates (Decimal degrees, GCS_WGS_1984) | | | | | |
| | Desktop pre-analysis | | Fist survey | | Second survey | |
	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude
FLO_11	12,249	-5,373246	12,248889	-5,373333	12,24898	-5,37323
FLO_12	12,25229	-5,381236	12,252222	-5,381111	12,25238	-5,38127
FLO_13	12,25464	-5,392134	12,252222	-5,386944	12,25463	-5,39214
FLO_14	12,243351	-5,397209	12,237778	- 5,395000	12,25335	-5,39934
FLO_15	12,235296	-5,404617	12,235000	-5,407500	12,23532	-5,40464
FLO_16	12,22414	-5,399362			12,22847	-5,33920
FLO_17	12,222341	-5,391783			12,22404	-5,38622
FLO_18	12,215251	-5,339114			12,21530	-5,33891
FLO_19	12,249303	-5,323398	12,238611	-5,317500	12,24930	-5,32340
FLO_20	12,229197	-5,389276	12,229444	-5,390000	12,22927	-5,38965

Figure 10: Flora and Habitat Survey Points.

For every Survey Point a standard field datasheet was compiled and at the end of each day were transferred to a digital model and stored in duplicate, using an online backup. On the datasheet were reported information on

habitat and vegetation characteristics, floristic observations, main disturbances and degree of fragmentation, photographic documentation (in four cardinal point), other incidental observations of fauna and any other information considered useful. Any further relevant information from interviewing people living nearby was taken in count (Figure 11).

Figure 11: Example of standard field datasheet used from the local team during the flora and habitat survey.

7.2.3.2 Herptile and freshwater species

During the first season, a herptile and freshwater species survey was carried out between the 29th and 30th March 2023.

Amphibians, terrestrial reptiles (excluding marine turtles), arthropods, fish and mollusks were surveyed using a combination of underlined visual encounter survey (VES), audio encounter survey (AES) and dip netting (NET).

At each Survey Points (FRE_00) VES, AES and NET surveys were conducted in selected habitat, targeting micro-habitats suitable for the presence of herptiles and freshwater species (especially *Target Species*), to investigate its actual presence within the Project Area of Influence (2 km).

Information and coordinates (Decimal degrees, GCS_WGS_1984) of the Survey Points are reported in Table 2, and their locations are shown in Figure 12. However, in the three sampling points defined during the preparatory office study, no aquatic ecosystems were found, so three new locations were defined *in situ* with ecological values for herptiles and freshwater species within a AoI of 5 km.

Table 2: Herptile and freshwater species sampling points (SPs) coordinates and information

ID	Old coordinates (Decimal degrees, GCS_WGS_1984)		New Sampling Points (Decimal degrees, GCS_WGS_1984)	
	Longitude	Latitude	Longitude	Latitude
FRE_01	12,24283	-5,32801	12.270000	-5.313611
FRE_02	12,24156	-5,3269	12.244167	-5.296944
FRE_03	12,24267	-5,32531	12.243889	-5.325278
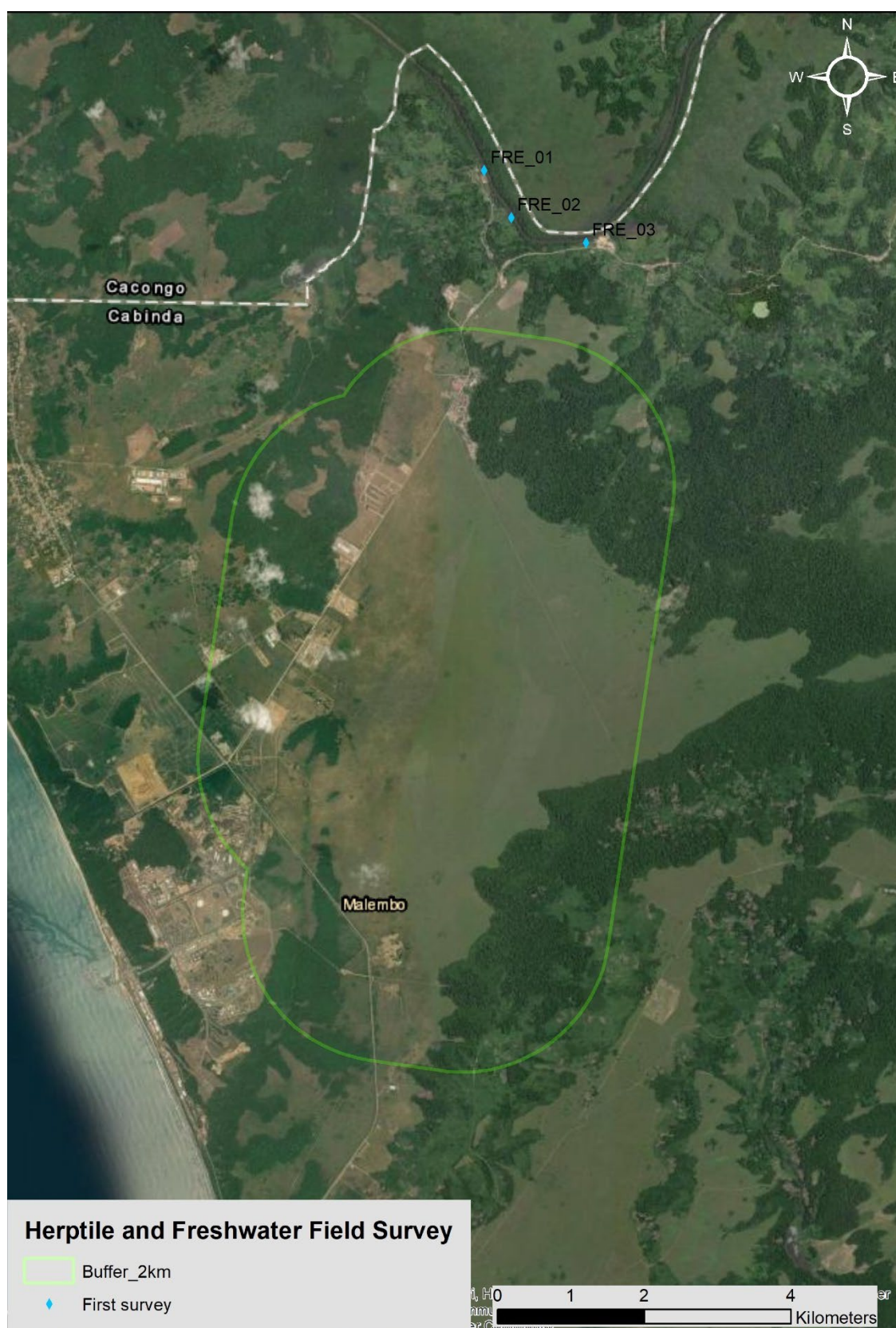
Figure 12: Herptile and Freshwater species Survey Points

For every Survey Point a standard field datasheet was compiled and at the end of each day were transferred to a digital model and stored in duplicate, using an online backup. On the datasheet were reported information on

fauna observations, main disturbances, photographic documentation, other incidental observations of fauna and any other information considered useful. Any further relevant information from interviewing people living nearby was taken in count (Figure 13).

Figure 13: Example of standard field datasheet used from the local team during the herptile and freshwater species survey.

The second field survey for the herpetofauna was carried out between October 6th and 17th 2023, during day and night periods. Contrary to what was carried out during the first field survey and given the terrain conditions that were found the first time, for the second field survey it was decided to carry out this sampling at the same survey points defined for the mammals, to maximize the coverage of the study area. The field surveyor aimed for direct or indirect signs of the presence, including vocalization listening, and search for spawn clumps and mats, as well as other presence signs, including captures by local people. For this study, any observations were registered in the pre-defined field forms related with the mammals, at all sampling points, which at the end of each day were transferred to the digital model and stored in duplicate, using an online backup.

7.2.3.3   Birds and bats

The first Birds and Bats survey was carried out between the 29th of March and 3rd April 2023, the second one between the 6th and the 22nd of October 2023.

Birds had been surveyed using <u>vantage points</u> where at each Survey Points (BAB_00) observation were made from a fixed and specific position. The position of the <u>vantage points</u> has been determined in situ, taking into consideration the area of possible inspection, within a buffer zone of 50 km from the Project. Given the elusiveness of some species, bird surveys start half an hour before dawn and half an hour after dusk. Even if <u>nocturnal survey</u> is important to detect nocturnal species, due to high safety risk for the team, this methodology was not possible to achieve.

Bats had been surveyed using a combination of internal and external visit to possible roosting places. At each Survey Points (BAB_00) the surveys were conducted in form of slow walking along the four cardinal points (each transect 500 m long or more, depending on accessibility), focusing on finding habitats with the highest potential for hosting bats (especially *Target Species*) to investigate its actual presence within the Project Area of Influence (50 km). In addition, and during the second field survey, nocturnal echolocation was carried out using a bat detector (ECHO METER TOUCH 2 PRO), from Wildlife Acoustics (Figure 14).

Figure 14: Nocturnal survey with the use of a bat detector, during the second field season.

Birds and bats surveys were conduct in selected habitat, stopping to scan priority habitat/features (*i.e.,* trees, abandoned house, dense hedgerows, …) that were more suitable for the presence of birds and bats (especially *Target Species*). The surveyors had examined direct or indirect signs of the presence of the species, and they focused on listening vocalization, identification of any other presence signs.

The feasibility of the Survey Points had been determinate also *in situ* taking in consideration the accessibility and avoiding risky and dangerous situations.

Information and coordinates (Decimal degrees, GCS_WGS_1984) of the Survey Points are reported in Table 3, and their locations are shown in Figure 15 and Figure 16.

Table 3: Birds and bats sampling points (SPs) coordinates.

ID	Coordinates (Decimal degrees, GCS_WGS_1984)					
	Desktop pre-analysis		First survey		Second survey	
	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude
BAB 01	12,225545	-5,327197	12,228056	-5,329444	12,225545	-5,327197
BAB 02	12,236794	-5,322778	12,236667	-5,322500	12,236744	-5,322648
BAB 03	12,243825	-5,324987			12,244108	-5,323554
BAB 04	12,257887	-5,335031			12,25786	-5,33503
BAB 05	12,21992	-5,339652	12,22	-5,339722	12,219887	-5,339603
BAB 06	12,252061	-5,345477			12,252082	-5,345433
BAB 07	12,239205	-5,348892			12,239175	-5,348869

WSP

ID	Coordinates (Decimal degrees, GCS_WGS_1984)					
	Desktop pre-analysis		First survey		Second survey	
	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude
BAB 08	12,253668	-5,368377	12,258889	-5,369444	12,25367	-5,36836
BAB 09	12,22434	-5,368578	12,224444	-5,368333	12,224388	-5,368596
BAB 10	12,22434	-5,383845			12,22432	-5,38383
BAB 11	12,250655	-5,377819	12,248889	-5,373333	12,24998	-5,37897
BAB 12	12,253066	-5,392684	12,252222	-5,381111	12,25350	-5,39208
BAB 13	12,236995	-5,395697	12,232222	-5,393889	12,23691	-5,39522
BAB 14	12,235388	-5,369382			12,23544	-5,36932
BAB 15	12,241816	-5,404737	12,235	-5,4075	12,24183	-5,40470
BAB 16	12,191464	-5,379596	12,191389	-5,379722	12,19324	-5,37392
BAB 17	12,211571	-5,424432			12,21003	-5,42579
BAB 18	12,187217	-5,359489	12,187222	-5,359444	12,18796	-5,36301
BAB 19	12,220755	-5,309509			12,21952	-5,31115
BAB 20	12,243114	-5,296245	12,243056	-5,296111	12,24312	-5,29632
BAB 21	12,253725	-5,306098	12,253611	-5,306111	12,25381	-5,30628
BAB 22	12,260547	-5,29814			12,26488	-5,28540
BAB 23	12,28518	-5,354985			12,28251	-5,35396
BAB 24	12,278358	-5,39364			12,27849	-5,39360
BAB 25	12,274569	-5,310646	12,274444	-5,310556	12,27461	-5,31056
BAB 26	12,156612	-5,681806	12,158889	-5,700278	12,15659	-5,68025
BAB 27	12,186046	-5,725183			12,16888	-5,70558
BAB 28	12,236136	-5,802642			12,21085	-5,71467
BAB 29	12,284677	-5,793863			12,24103	-5,68840
BAB 30	12,030431	-4,944503			12,08088	-5,00453
BAB 31	12,116805	-4,990902			12,11761	-5,00170
BAB 32	11,995453	-5,004465			12,04902	-5,02599
BAB 33	12,116805	-5,172931			12,10614	-5,10118
BAB 34	12,479435	-5,102261			12,45021	-5,17476
BAB 35	12,509416	-5,131528			12,48025	-5,16021
BAT 01					12,23958	-5,32976
BAT 02					12,24078	-5,33341
BAT 03					12,23950	-5,39844
BAT 04					12,23947	-5,32410
BAT 05					12,23958	-5,32285
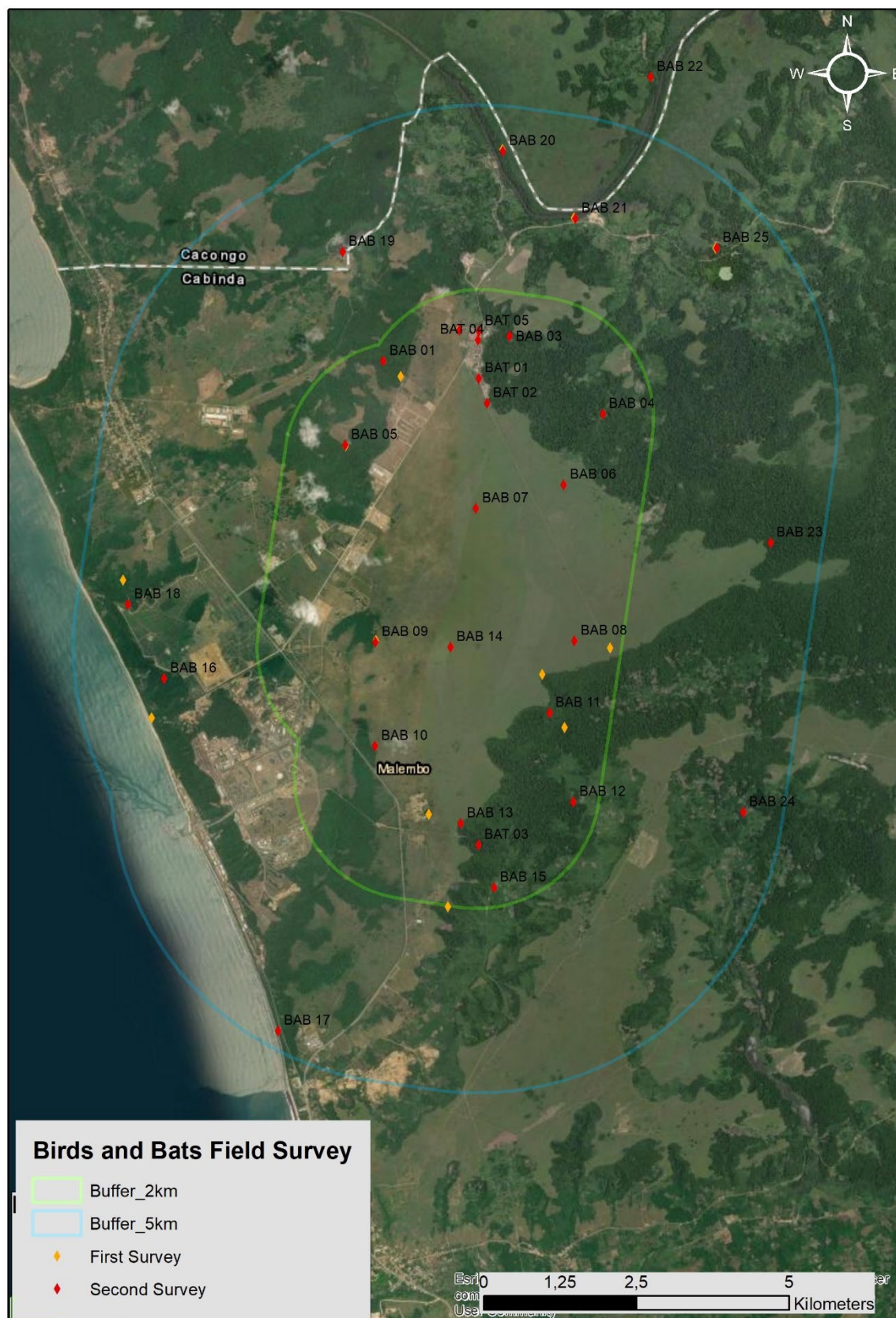
Figure 15: Bird and Bats Survey Points at 2 km and 5 km of buffer zones
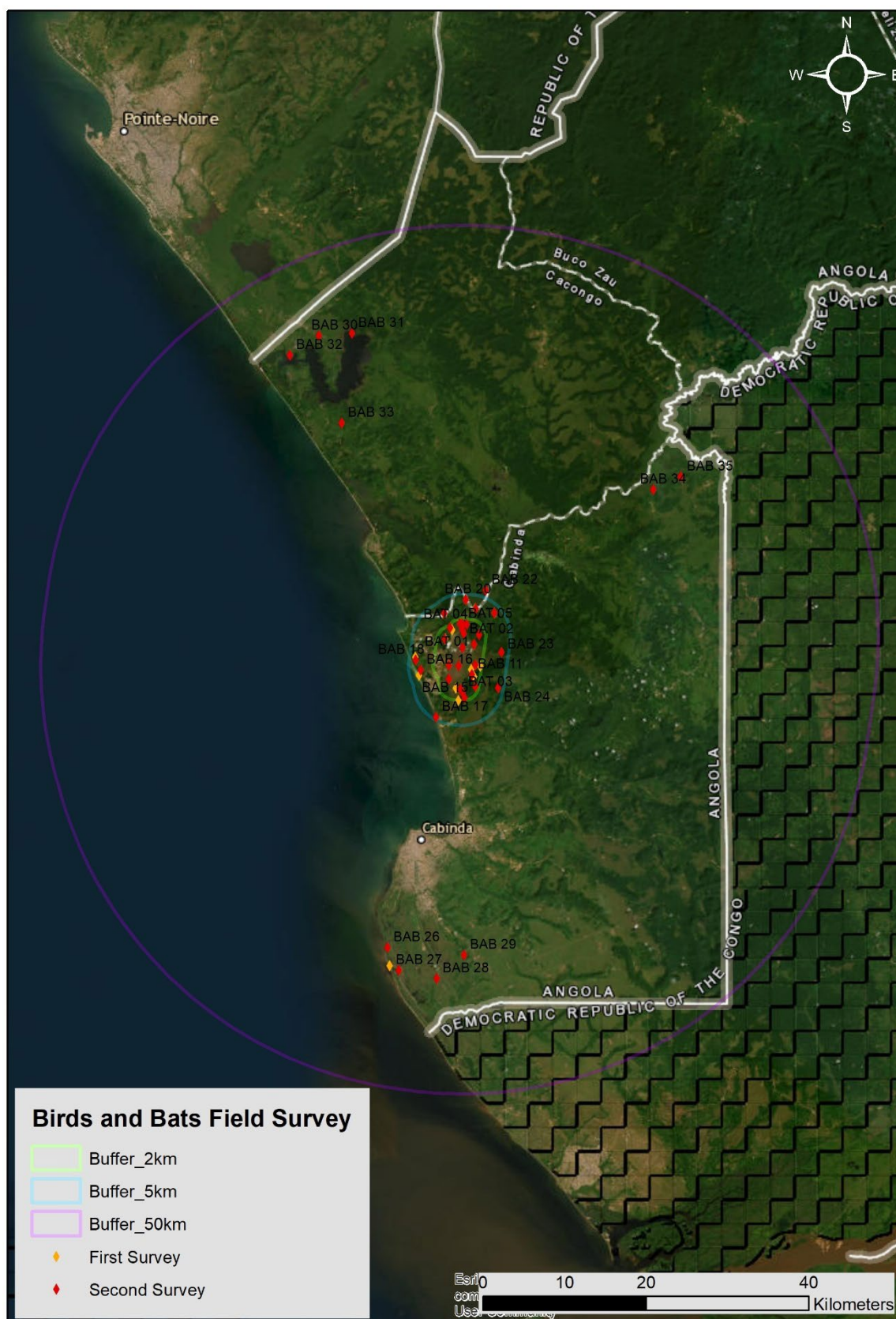
Figure 16: Bird and Bats Survey Points at 50 km of buffer zones
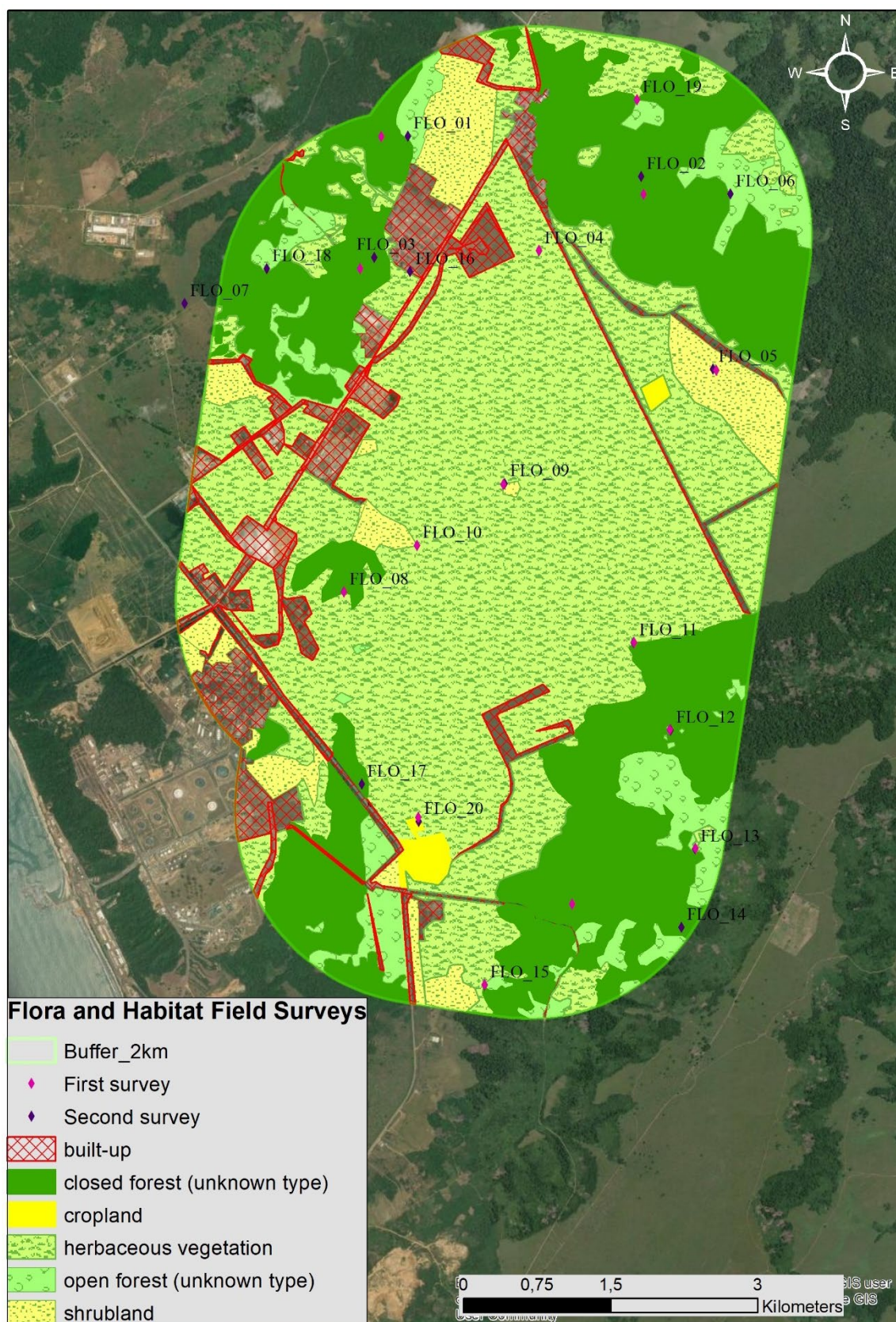
For every Survey Point a standard field datasheet was compiled and at the end of each day were transferred to a digital model and stored in duplicate, using an online backup. On the datasheet were reported information on

fauna observations, main disturbances, photographic documentation, other incidental observations of fauna and any other information considered useful. Any further relevant information from interviewing people living nearby was taken in count (Figure 17).

Figure 17: Example of standard field datasheet used from the local team during the birds and bts species survey.

7.2.3.4   Mammals

The first Mammal survey was carried out between the 29th of March and 3rd April 2023, and the second field survey from the 4th to the 19th of October 2023, except for the camera traps that were kept on site for 30 consecutive days.

Mammals and Micromammals were surveyed using a combination of <u>linear transect</u>, <u>camera trap</u>, <u>Sherman traps</u>, and any other incidental sightings during the above-mentioned field surveys.

At each Survey Points (MAM_00), direct and indirect observation were investigated through <u>linear transect</u> proceeded in the four cardinal directions (each transect of 500 m), however the feasibility and the length has been determinate *in situ*, taking in consideration the accessibility of the transect, climatic conditions and avoiding risky and dangerous situations. Surveys conducted in selected habitat, targeting micro-habitats suitable for the presence of mammals (especially *Target Species*). The surveyors had examined direct or indirect signs of the presence of the species, and focused on listening vocalization, identification of faces, food-remains, den and burrows, and any other signs of presence.

In addition, 12 <u>camera traps</u> (CAM_00) and two lines of 5 <u>Sherman traps</u> (LMM_00) had been placed within the Project area, focusing on finding habitats with the highest potential for hosting mammals (especially *Target Species*) to investigate its actual presence within the Project Area of Influence (5 km) (as shown in the Figure 18 and Figure 19). The cameras were placed *in situ* with appropriate specificities depending on the nature of the location, they were programmed to take 5 photos at an interval of 5s per sequence with a medium sensitivity level due to vegetation and to avoid false shots.

Figure 18: Placement by the fauna team expert of a camera trap during the second field survey.

Figure 19: Two Sherman traps located in LMM survey points.

Direct observations were made daily from 7 am to 5 pm during the day and at night from 6 pm to 8 pm on average. Given the elusiveness and the nocturnal behaviour of some species, a <u>nocturnal transect</u> was planned, but due to high safety risk for the team, this methodology was possible to achieve only for some safer locations.

Information and coordinates (Decimal degrees, GCS_WGS_1984) of the Survey Points are reported in Table 4, while their locations are shown in Figure 20 and Figure 21, when not possible (due to risk areas or restricted access) these points were relocated to a nearby area with the same characteristics and similar habitats.

Table 4: Mammal sampling points (SPs) coordinates.

ID	Coordinates (Decimal degrees, GCS_WGS_1984)					
	Desktop pre-analysis		First survey		Second survey	
	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude
MAM_01 CAM_01	12,243762	-5,325248	12,243889	-5,325278	12,244108	-5,323554
MAM_02 CAM_12	12,214683	-5,341478	12,236667	-5,322500	12,215686	-5,338961
MAM_03 CAM_07	12,236999	-5,342155	12,243611	-5,337222	12,236999	-5,342155

| ID | Coordinates (Decimal degrees, GCS_WGS_1984) | | | | | |
| | Desktop pre-analysis | | First survey | | Second survey | |
	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude
MAM_04	12,261795	-5,337872			12,26179	-5,33787
MAM_05	12,256611	-5,370107	12,248889	-5,373333	12,25660	-5,37011
MAM_06 CAM_06	12,22122	-5,367853	12,219444	-5,366389	12,22114	-5,36781
MAM_07 CAM_03 CAM_08	12,220318	-5,396256			12,23990	-5,39844
MAM_08	12,251426	-5,384759	12,249722	-5,378056	12,251426	-5,384759
MAM_09	12,251426	-5,395354	12,238056	-5,395556	12,25529	-5,39331
MAM_10 CAM_10	12,241282	-5,403018			12,25529	-5,40345
MAM_11 CAM_11	12,185603	-5,361315	12,197778	-5,377778	12,18796	-5,36301
MAM_12 CAM_09	12,21085	-5,419249			12,20823	-5,42002
MAM_13 CAM_04	12,2645	-5,301579	12,264444	-5,315556	12,264500	-5,301579
MAM_14 CAM_02	12,219191	-5,306087			12,223731	-5,318159
MAM_15 CAM_05	12,244213	-5,296845	12,244167	-5,296944	12,243328	-5,296369
MAM_16	12,270136	-5,313526	12,270000	-5,313611	12,27021	-5,31353
MAM_17	12,272165	-5,34238			12,26527	-5,34019
MAM_18	12,283436	-5,369881			12,28344	-5,36988
MAM_19	12,278251	-5,395579			12,278577	-5,395176
MAM_20	12,266304	-5,375066	12,260833	-5,371944	12,266595	-5,375104
MAM_03*	12,236999	-5,342155			12,236999	-5,342189
MAM_06*	12,221220	-5,367853			12,221220	-5,367914
MAM_10*	12,241282	-5,403018			12,241282	-5,402672
MAM_16*	12,270136	-5,313526			12,270136	-5,312500

ID	Coordinates (Decimal degrees, GCS_WGS_1984)					
	Desktop pre-analysis		First survey		Second survey	
	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude
LMM_01					12,259692	-5,370963
LMM_02					12,237647	-5,339428
LMM_03					12,223783	-5,369307
LMM_04					12,236826	-5,387222
MAM_00: Mammals survey points; MAM_00*: Mammals nocturnal survey points; CAM_00: camera traps survey points. LMM_00: linear Sherman trap survey points.						

Figure 20: Mammals Survey Points at 5 km of buffer zones.
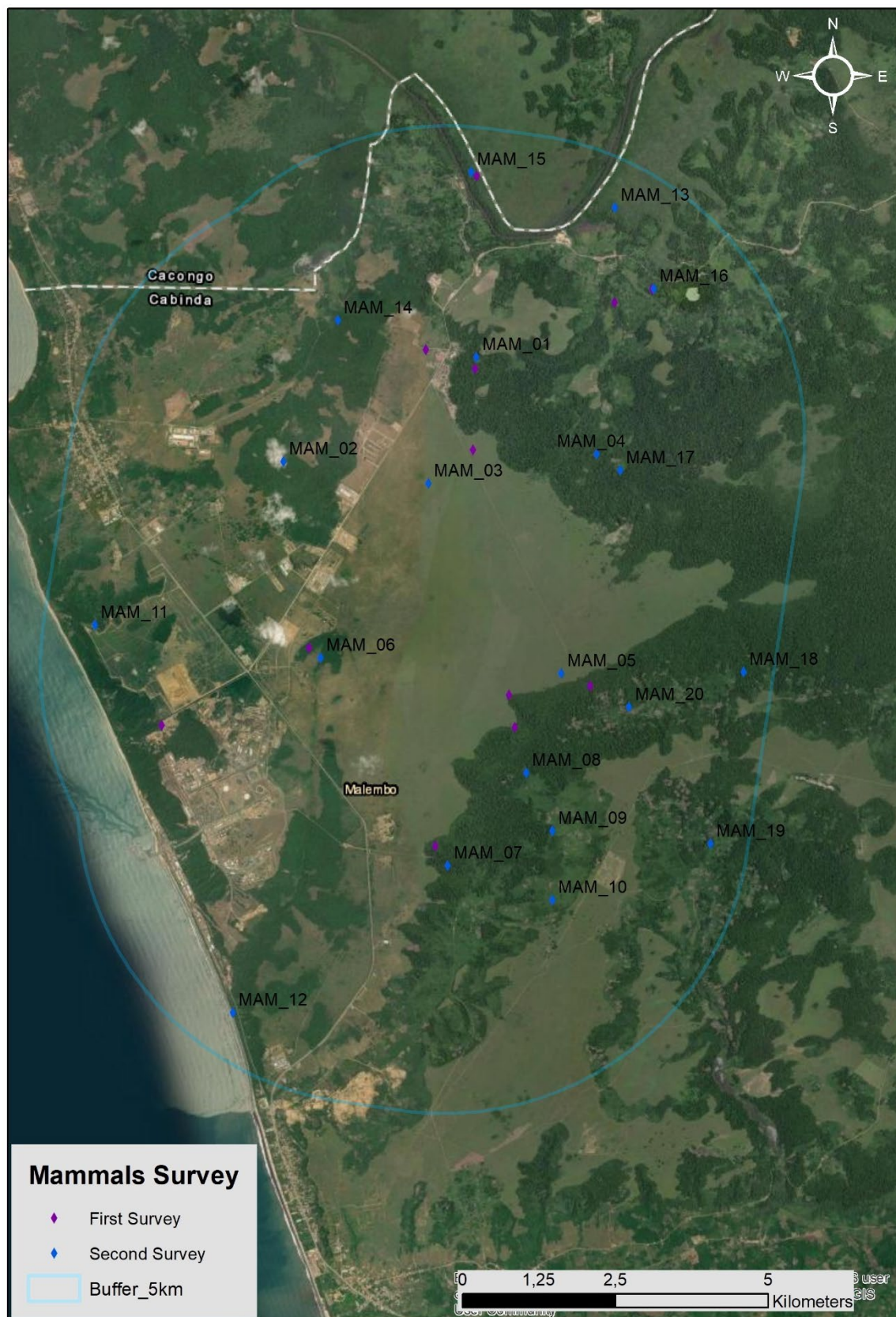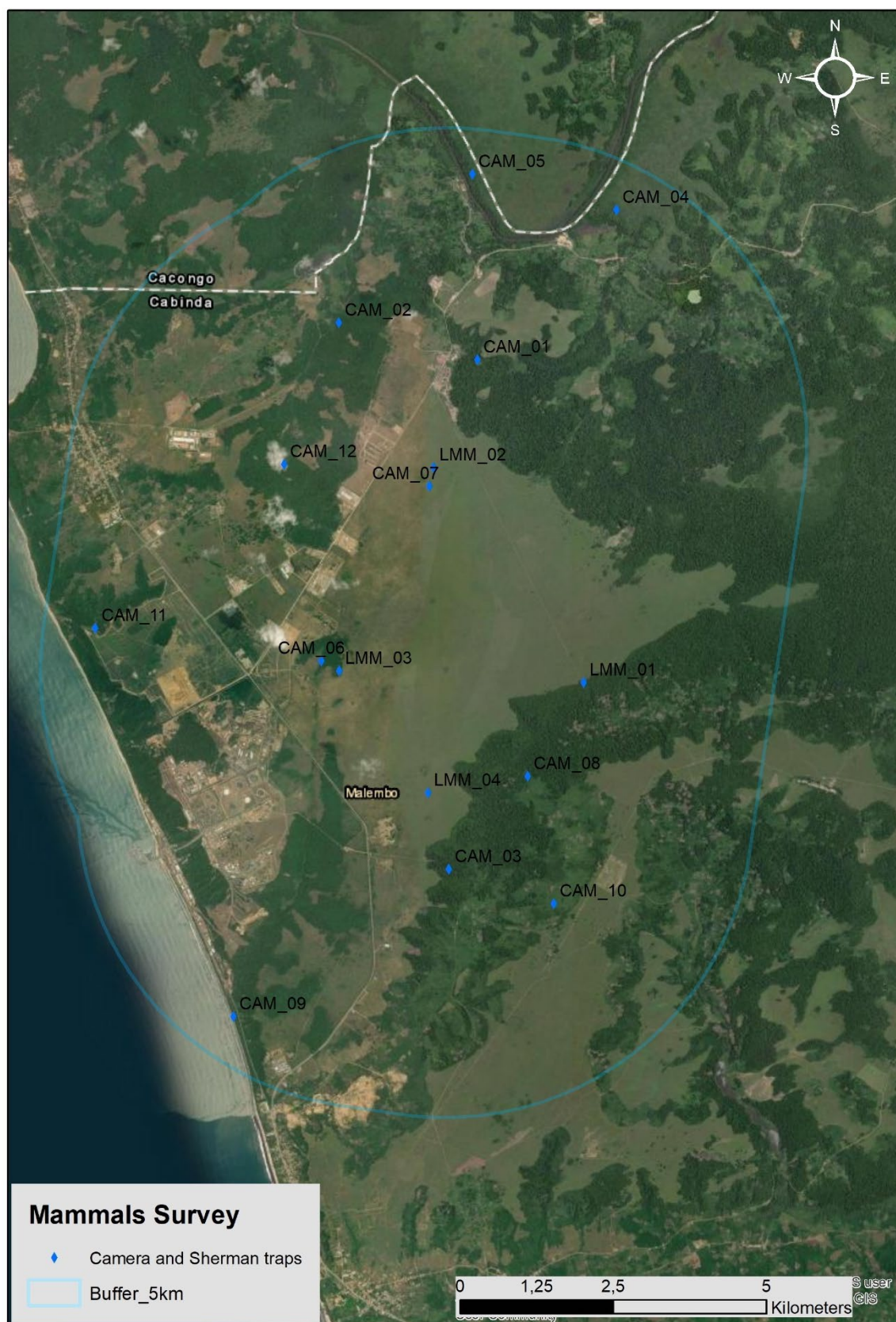
Figure 21: Camera and Sherman traps at 5 km of buffer zones, during the second field surveys.

For every Survey Point a standard field datasheet was compiled and at the end of each day were transferred to a digital model and stored in duplicate, using an online backup. On the datasheet were reported information on

fauna observations, main disturbances, photographic documentation, other incidental observations of fauna and any other information considered useful. Any further relevant information from interviewing people living nearby was taken in count (Figure 22).

Figure 22: Example of standard field datasheet used from the local team during the mammal species survey.

7.2.4   Identification of Critical Habitats

A screening based on available information was conducted to identify the potential presence of Critical Habitats (CHs) within the AoI according to IFC Performance Standard 6 (Guidance Note 6, PS6, 2019).

According to IFC PS6, the designation of Critical Habitat is triggered by the criteria reported below.

i)   Habitats of significant importance to Endangered and/or Critically Endangered species.

The presence of species having Endangered (EN) or Critically Endangered (CR) conservation status according to global IUCN criteria was considered. Species that are listed nationally/regionally as CR or EN were considered in consultation with competent professionals. In the absence of a Global IUCN assessment (*e.g.*, Not Evaluated NE, or Data Deficient DD) local assessments were considered.

For assessing the importance of the AoI for these species, the following thresholds were applied (Guidance Note 6, GN72, IFC 2019):

a)   areas that support globally important concentrations of an IUCN Red-listed EN or CR species (> 0.5% of the global population AND >5 reproductive units of a CR or EN species);

b)   areas that support globally important concentrations of an IUCN Red-listed VU species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN70(a);

c)   as appropriate, areas containing nationally/regionally important concentrations of an IUCN Red-listed EN or CR species.

ii)   Habitats of significant importance to endemic and/or restricted-range species.

The presence of endemic and/or restricted range species was considered. Restricted range refers to a limited extent of occurrence (EOO) less than 50,000 km^2 for terrestrial vertebrates and plants; global range of less than or equal to 500 km linear geographic span for coastal, riverine, and other aquatic species that do not exceed 200 km width at any point.

To assess the importance of the AoI for these species, the following threshold was applied (Guidance Note 6, GN75, IFC 2019):

a)   areas that regularly hold ≥10% of the global population size AND ≥10 reproductive units of a species.

iii)   Habitats supporting globally significant migratory and/or congregatory species.

The presence of Key Biodiversity Areas and Important Bird Areas identified for congregatory species and of Wetlands of International Importance designated under criteria 5 or 6 of the Ramsar Convention was considered. In addition, the presence of migratory and congregatory species was also considered.

To assess the importance of the AoI for these species, the following thresholds were applied (Guidance Note 6, GN78, IFC 2019):

a)   areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.

b)   areas that predictably support ≥10 percent of the global population of a species during periods of environmental stress.

iv)   Highly threatened and/or unique ecosystems.

Ecosystems that are at risk of significantly decreasing in area or quality, have a small spatial extent, and/or contain concentrations of biome-restricted species were considered for this criterion.

To assess the importance of the AoI for these habitats, the following thresholds were applied (Guidance Note 6, GN80, IFC 2019):

a)   areas representing ≥5% of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.

b)   Other areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.

v)   Areas associated with key evolutionary processes.

The presence of areas with landscape features that might be associated with evolutionary processes or populations of species that are especially distinct and may be of special conservation concern given their distinct evolutionary history was considered.

7.3   Results

7.3.1   Protected Areas and Internationally Recognized Areas

A Protected Area (PA) is a clearly defined geographical space, nationally or internationally recognized, dedicated, and managed, through legal or other means, to achieve the long-term conservation of nature with

associated ecosystem services and cultural values[10]. Sometimes, non-legally protected areas that are important for biodiversity may be defined by networks of internationally recognized environmental NGO's (*e.g.,* Important Bird Area (IBA) Birdlife International) based on solid standardized scientific criteria. Some of them may also overlap with PAs, while others remain often with no legal protection for a period until they can be eventually recognized as such by the local authorities.

The Project AoI is not located within any protected areas or internationally recognized areas (Figure 23).

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[10] https://www.iucn.org/our-work/topic/effective-protected-areas
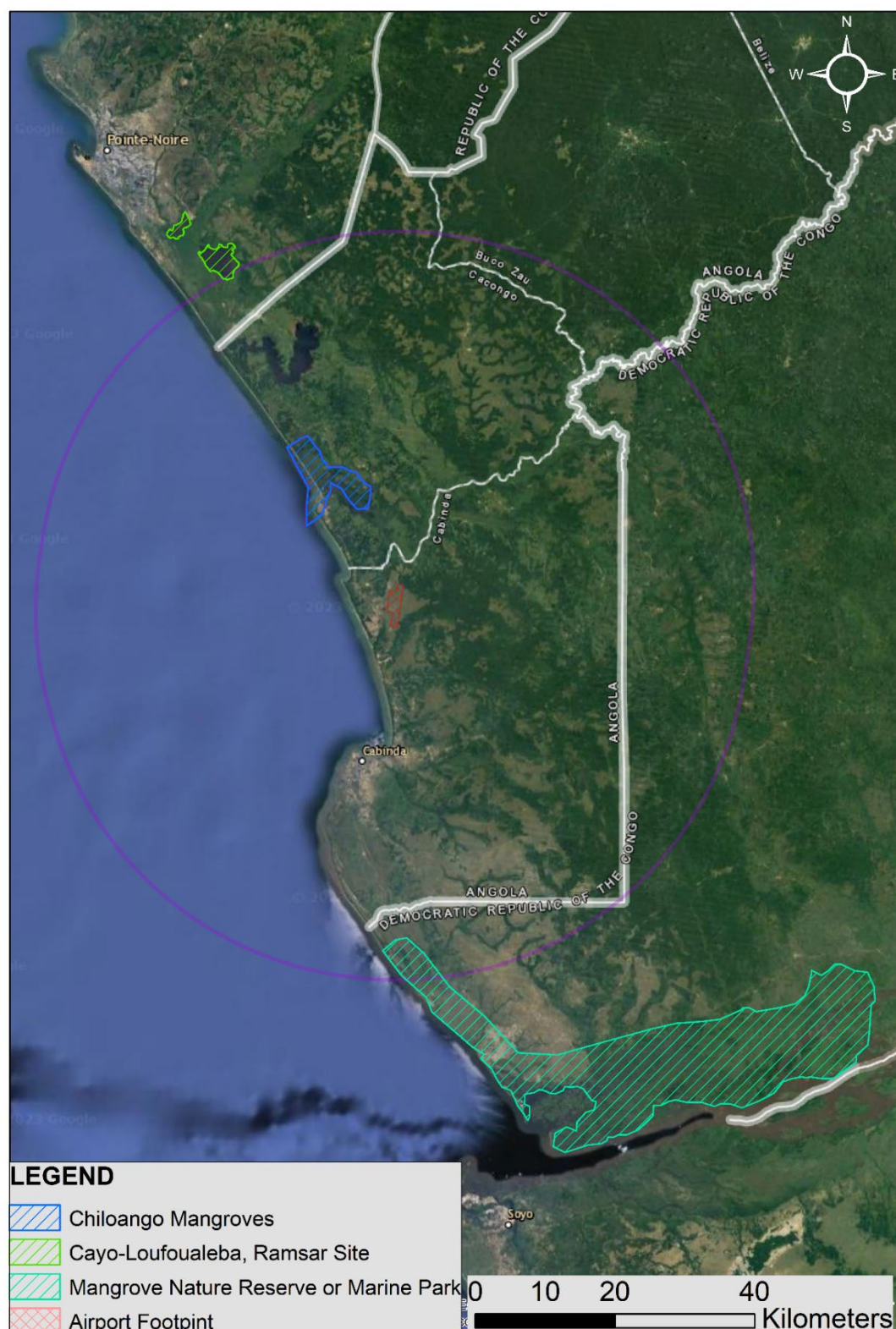
Figure 23: Protected areas and internationally recognized areas within 60 km from the Project Area of Influence.

Within the buffer zone of 20 km from the Project and heading northwest, we found the Chiloambo proposed PA, located approximately 5 km north-west of the site, a place dominated from the estuary of Chiloango river, with its lagoons, mangrove forest and Raphia swamps. An important project funded by UNEP and GEF that has

been recently implemented, to propose this ecosystem for protection[11]. The coastal wetland of Angola has suffered more disturbances than any other wetland in Angola. The coastal plain was extensively deforested during the colonial period and numerous small swamps were drained for health reasons and for freeing space for plantations and small-scale agriculture. The local people have always fished the rivers, lagoons, and ponds intensively, and have utilized the products of the riparian mangrove forest and swamps.

Within the buffer zone of 50 km from the Project and heading south, we found a portion of Mangrove National Park[12], located approximately at 50 Km south to the site, in the Congo river. It's a marine-oriented national park, and an important wetland under the Ramsar Convention. The park covers an area of 1000 km^2, in the Democratic Republic of the Congo. The wetlands of the national park are comprised of mangroves, lush forests, oak trees, walnut trees, red cedar, and African oak. Mixed in with the forest is a variety of brush vegetation and areas of grasslands. The Congo River and mangroves create a habitat that is supportive of crocodile, hippopotamus, and the endangered manatee. Above ground, there are also reedbuck, bushbuck, and a variety of reptiles, amphibians, and birds. The African fish eagle, greater flamingo, kingfisher, and goliath heron are some of the coveted bird sightings.

At last, within the buffer zone of 50 km from the Project is located to the north-west the Cayo-Loufouleba Ramsar Site, located approximately 50 km north west of the site, a complex terrestrial, marine and inland wetlands situated in Congo. It is an important refuge for the hippopotamus and chimpanzee, species of conservation concern. About 378 bird species (including about 284 breeding birds) and a significant number of waterbird species restricted to the Congo-Guinea biome have been spotted, thus contributing significantly to maintaining the biodiversity of the region. Meanwhile, always within the buffer zone of 50 km from the Project and heading northeast, it is designated the only official protected area in Cabinda: the Kakongo Forest Reserve, consisting of 650 km^2 of forest in the Maiombe region, close to the border with Congo, between the towns of Inhuca and Buco-Zau. However, this reserve was established in the 30s of the last centuries for reasons of forest exploitation and not nature conservation.

The Maiombe Forest Transboundary Initiative aims to protect the Maiombe forest region shared by Gabon, Congo, Democratic Republic of Congo, and Angola (Cabinda), is being implemented, with Angola establishing the Maiombe National Park to protect approximately 2000 km^2 of Maiombe forest within Cabinda's borders (Figure 24). It is an area of the Guineo-Congolian biome, covered mostly by secondary high dense tropical rainforest with small patches of climax rainforest, lowland drier forest, forest-woodland-savannah mosaics, and riverine gallery forests. It is home to iconic endangered wildlife species such as western lowland gorillas (*Gorilla gorilla gorilla*), central chimpanzees (*Pan troglodytes troglodytes*), forest elephants (*Loxodonta cyclotis*), giant ground pangolins (*Manis gigantea*), tree pangolins (*Manis tricuspis*), forest buffalos (*Syncerus caffer nanus*) and African grey parrots (*Psittacus erithacus*) as well as a number of other primates (white-nosed guenon, red-tailed guenon, golden potto, Bosman's potto), small antelopes (several duiker species, bushbuck, water chevrotain, sitatunga), red river hog, several mongoose species, otters, civets, genets, golden cat, among other species (Ron, 2017; Ron, 2011). The most important threats to this ecosystem are the unsustainable practice of slash-and-burn-based household cultivation for subsistence and small scale local commercial use, the bushmeat hunting for subsistence and small-scale commercial purposes using traditional methods, and the illegal wildlife trade within the province and across the border (targeting endangered iconic species)[13].

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[11]   https://www.unep.org/explore-topics/climate-action/what-we-do/climate-adaptation/ecosystem-based-adaptation/ecosystem-13   and https://cmr.mandela.ac.za/Research-Projects/EBSA-Portal/Angola/Chiloango-Mangroves

[12] https://national-parks.org/congo-dr/mangroves, https://www.protectedplanet.net/37044

[13] https://www.berggorilla.org/en/home/news-archive/article-view/the-struggle-for-survival-in-the-maiombe-forest-continues/

Figure 24: The Mayombe Forest Transfrontier Protected Area.

7.3.2   Natural and Modified Habitats

Based on the preliminary analysis, the habitat map was validated during the field surveys and classified into Modified or Natural Habitats in alignment with IFC PS6 definitions.

Natural Habitats occupy 30% of the total AoI and are represented by dense humid forests (26% of the AoI) and dense secondary forest (4% of the AoI). The mapping of watercourses and waterbodies have been difficult due to the poor quality of satellite imagery, tree cover and the impossibility of exploring in some areas. Therefore, their presence is not totally excluded in the forested areas.

The remaining 70% is covered by Modified Habitats, highly represented by shrub savanna (51% of the AoI), followed by a mosaic of cropland and forest (6% of the AoI), built-up and road areas (respectively 6% and 3% of the AoI), cropland (2% of the AoI), arboreal savanna and bare soil (both 1% of the AoI).

The area extension in meters square (mq^2) and the cover percentage (%) of each habitat are reported in Table 5 , while habitat distribution of the AoI according to the Copernicus Global Land Service and GLC2000 habitat classification system and revised with the field surveyor's evaluation is shown in Figure 25.

Table 5: Habitat types present in the AoI of 2 km.

Habitat types		Total AoI	
Habitat	**Preliminary habitat**	**Area (mq^2)**	**%**
Natural Habitats			
Dense humid forest	Closed forest (unknown type)	14409042,28	28

Habitat types		Total AoI	
Habitat	Preliminary habitat	Area (mq^2)	%
Dense secondary forest	Closed forest (unknown type) and open forest (unknown type)	784571,45	2
Natural habitats sub-total		*15193613,73*	*30*
Modified habitats			
Shrub savanna	Shrubland and herbaceous vegetation	26437208,22	51
Mosaic of cropland and forest	Open forest (unknown type) and herbaceous vegetation	3088724,34	6
Built-up	Built-up	3282788,22	6
Road	Built-up	1678629,68	3
Cropland	Cropland	786793,04	2
Arboreal savanna	Open forest and shrubland	587425,35	1
Bare soil	Built-up and herbaceous vegetation	683173,29	1
Modified habitats sub-total		*36544742,14*	*70*
Total		51738355,87	100
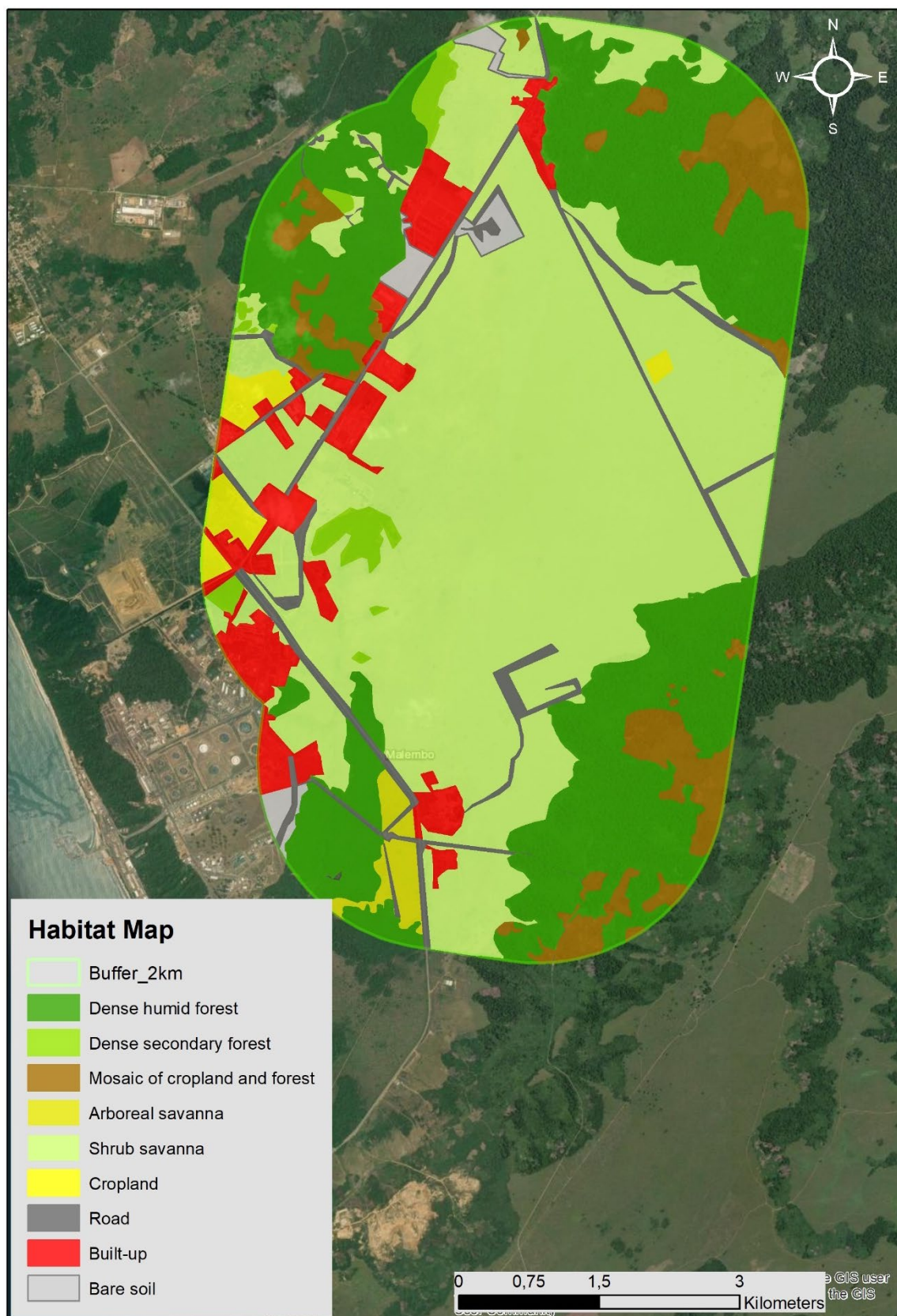
Figure 25: Definitive habitat map of the AoI.

In the following paragraphs are described the habitats surveyed and monitored during the two-field survey, according to GLC 2000 habitat classification system (*reported in bracket*). In addition to natural habitat, modified habitats are described where natural vegetation has been observed recolonizing them.

The full description of each surveyed point (FLO_01 to FLO_20) is available in the APPENDIX B

Dense humid forest *(closed evergreen lowland forest)*

The dense humid forest is typically on land up to 1000 metres a.s.l. with a tree canopy cover greater than 70% and height greater than 5 metres.

In a recurring way, these forests are within a geological context with a series of gorges and ravine terrain. The arboreal stratum is made up of large trees, over 50 meters tall, among which stand out *Albizia adiantifolia*, *Anthocleita schweinfurthii*, *Cola diversifolia*, *Dracaena mannii*, *Markhamia obtusifolia*, *Musanga cecropioides*, *Piptadeniastrum africanum*, *Pycnanthus angolensis*, *Pteleopsis myrtifolia*, *Ricinodendron heudelotii*, *Oncoba welwitschii*, among others (Figure 26). The shrub layer is constituted by shade-tolerant species, such as *Combretum racemosum, Dichapetalum lujae, Psychotria* sp., *Rourea coccinea, Tabernanthe iboga* and others. The herbaceous layer is also made up of shade species such as *Anchomanes difformis*, *Brillantaisia owariensis* and a wide variety of ferns, mosses, and mushrooms. The difficult access, due to the landmine's threats, the lack of road and some fencing around the areas, keeps the vegetation in a natural state.
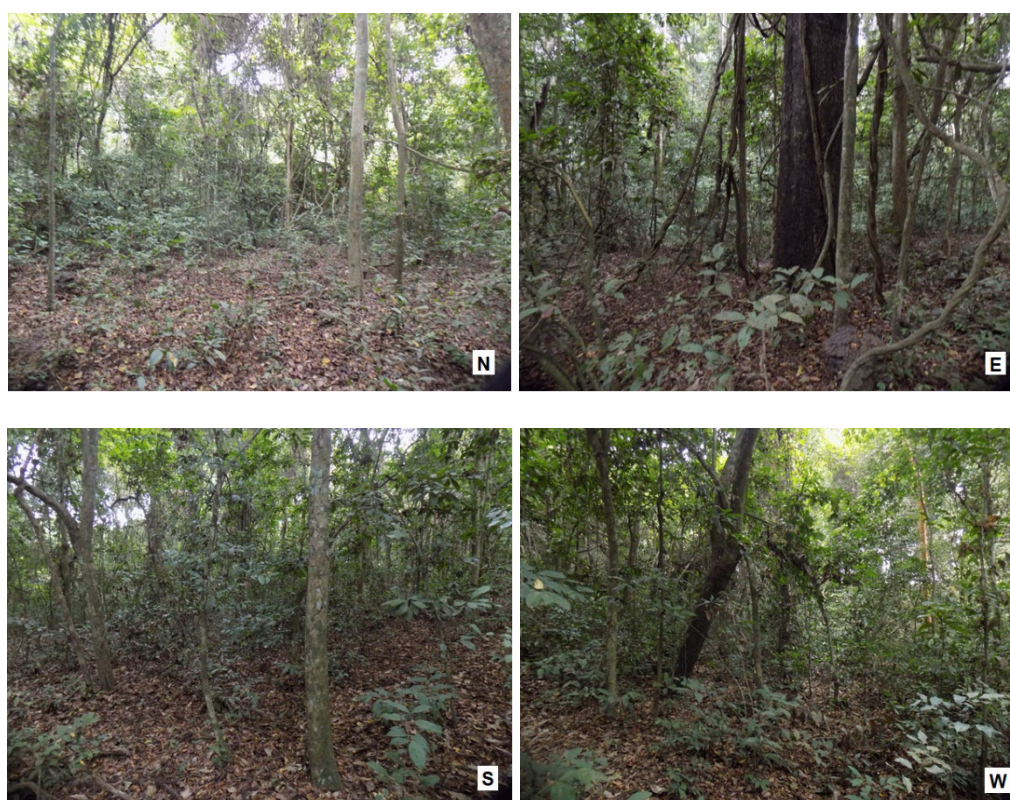
Figure 26: Dense humid forest (closed evergreen lowland forest GLC2000 habitat) observed within the AoI at FLO02 Survey Point.

Dense secondary forest *(degraded evergreen forest)*

This forest classes on land up to 1000 metres above the sea level, with tree canopy cover is between 40% and 70% and height greater than 5 metres.

The characteristic vegetation of this point is of the secondary growth dense forest type, consisting of a great heterogeneity of arboreal and shrubby elements, many of which are in regeneration, distributed in a variable way, with emphasis on the large number of vines that hang over the trees and bushes*.*

A very common species in this habitat is *Hymenocardia ulmoides*. The tree layer is dominated by medium-sized trees, and the main species identified are: *Albizia gummifera*, *Dracaena mannii*, *Hymenocardia ulmoides*, *Lannea welwitschia*, *Macaranga gilletii*, *Oncoba welwitschii*, *Pteleopsis myrtifolia*, *Pteleopsis anisoptera, Ricinodendron heudelotii*, *Spondias mombim*, *Trema guineensis*, *Vernonia conferta* and others.

Density in the shrub layer is considerable, consisting of many trees in regeneration, vines and others that occupied the gaps left by the large trees. The main species identified in shrub layer are *Albizia gummifera, Alchornia cordifolia*, *Cnestis corniculate, Cnestis ferruginea*, *Dalhousiea africana*, *Dracaena viridifolia*, *Harungana madagascariensis*, *Macaranga* sp., *Oncoba welwitschii*, *Sterculia tragacantha*, *Trema guineensis*, *Vernonia conferta* among others. In the transition with the savannah predominate: *Bridelia micrantha*, *Heinsia crinite* and *Hymenocardia ulmoides*. Several climbing species hang over the trees, especially *Calopogonium mucunoides*, *Cnestis corniculate*, *Dioscorea sp, Landolphia spp.*, *Mondia whitei*, *Mucuna pruriens*, and *Salacia sp.* stand out (Figure 27).

Due to anthropic degradation, in some places there is a great invasion by *Chromolaena odorata*, one of the main invasive species in Angola that occupies sites generally abandoned after anthropogenic intervention. Generally, the vegetation presents a medium level of degradation, due to the use of the area for agriculture and/or logging. Fragments of the natural formation are restricted to places of difficult access, such as ravines.
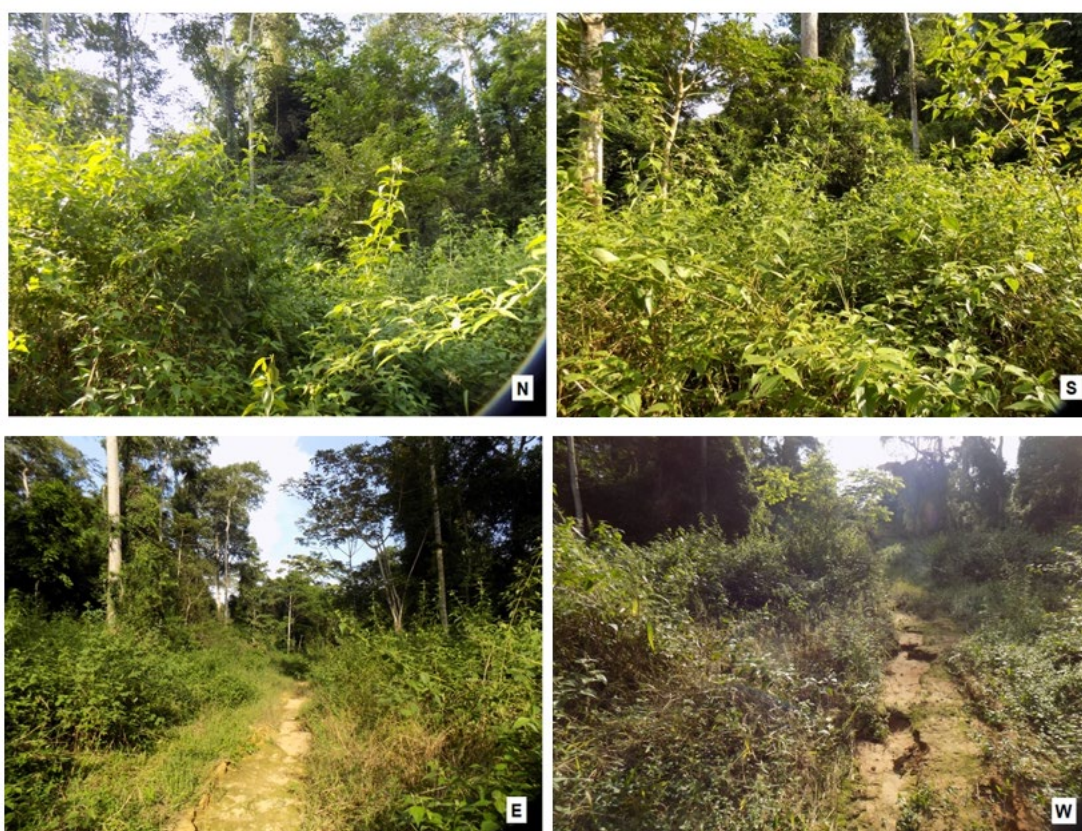
Figure 27: Dense secondary forest (degraded evergreen forest GLC2000 habitat) observed within the AoI at FLO14 Survey Point.

Shrub savanna *(deciduous closed / open shrublands with sparse trees)*

Shrub canopy cover is greater than 15% and canopy height less than 5 metres with a sparse tree layer covering less than 15%.

It corresponds to a shrubby coastal and arboreal savanna formation, with dispersed shrubs, where *Annona senegalensis*, *Bridelia michrantha, Ficus* sp., *Hymenocardia ulmoides*, *Ximenia americana*, *Piliostigma thonningii, Psorospermum febrifugum, Psychotria* sp*, Ricinodendron heudelotii*, *Tabernanthera iboga* and *Vitex madiensis* are dominant (Figure 28). In the herbaceous layer, in addition to low-sized grasses (*Ctenium concinum*, *Digitaria* sp. and *Panicum* sp.), *Aspilia kotschy, Uraria picta*, *Indigofera paracapitata*, *Indigofera* sp. and others (Figure 29).

Some species of anthropic origin can also be observed around the Survey Points, such as *Elaeis guineensis* (Palm trees), *Bambusa vulgaris* (Bamboo), *Mangifera indica* (Mango tree) and *Murraya paniculata* (orange jasmine) forming a cluster in the middle of the savannah.

It is a habitat cyclically subject to fires in the dry season, so almost all species have some morphological or physiological adaptation to fire. It presents a medium level of anthropic degradation, where some places were recently used for agriculture purpose, now abandoned, and colonized by *Chromolaena odorata*, an invasive species and adapted to places with anthropic disturbance.

Figure 28: Shrub savanna (deciduous closed / open shrublands with sparse trees GLC2000 habitat) observed within the AoI at FLO04 Survey Point.

Figure 29: Shrub savanna (deciduous closed / open shrublands with sparse trees GLC2000 habitat) observed within the AoI at FLO10 Survey Point.

Mosaic of cropland and forest *(mosaic forest/croplands)*

This forest biome consists of a fragment of degraded forest, of secondary growth, isolated in the middle of the savannah, or areas in the middle of the mines in the process of being deforested and burnt (shifting agriculture) to convert it into family farmland (Figure 30 and Figure 31). It presents evident signs of anthropic degradation (cassava plantations and trunks to produce charcoal) and some elements that testify the natural and original vegetation. In general, the natural vegetation tends to regenerate itself, but the intensity of use of the area by man has led to its rapid degradation.

The main tree species identified were *Anthocleista schweinfurthii*, *Cnestis corniculate*, *Ficus* sp., *Hymenocardia ulmoides*, *Macaranga gilletii*, *Musanga cecropioides*, *Pteleopsis anisoptera, Ricinodendron heudelotii*, *Trema guineensis*, *Vernonia conferta*, and others, where some of them indicate the phase of regeneration. The *Murraya paniculata*, not a native species, spreads throughout the surroundings. In the shrub layer, several species can be found, such as *Oncoba welwitschii*, *Harungana madagascariensis*, *Alchornia cordifolia*, *Cnestis corniculata*, *Psychotria* sp., among others. There is also a great profusion of vines such as *Landolphia* sp., *Dioscorea alata*, *Dioscorea bulbifera*, *Rourea coccinea* and *Flagellaria guineensis*. The herbaceous layer is made up of shade plants such as *Anchomanes difformis* and various Rubiaceae, with emphasis on the genus *Psychotria*. The abandoned fields are colonized by *Chromolaena odorata* and a set of other herbaceous plants that take advantage of the penetration of sunlight.

Figure 30: Mosaic of cropland and forest (mosaic forest/croplands GLC2000 habitat) observed within the AoI at FLO08 and FLO12 Survey Points.
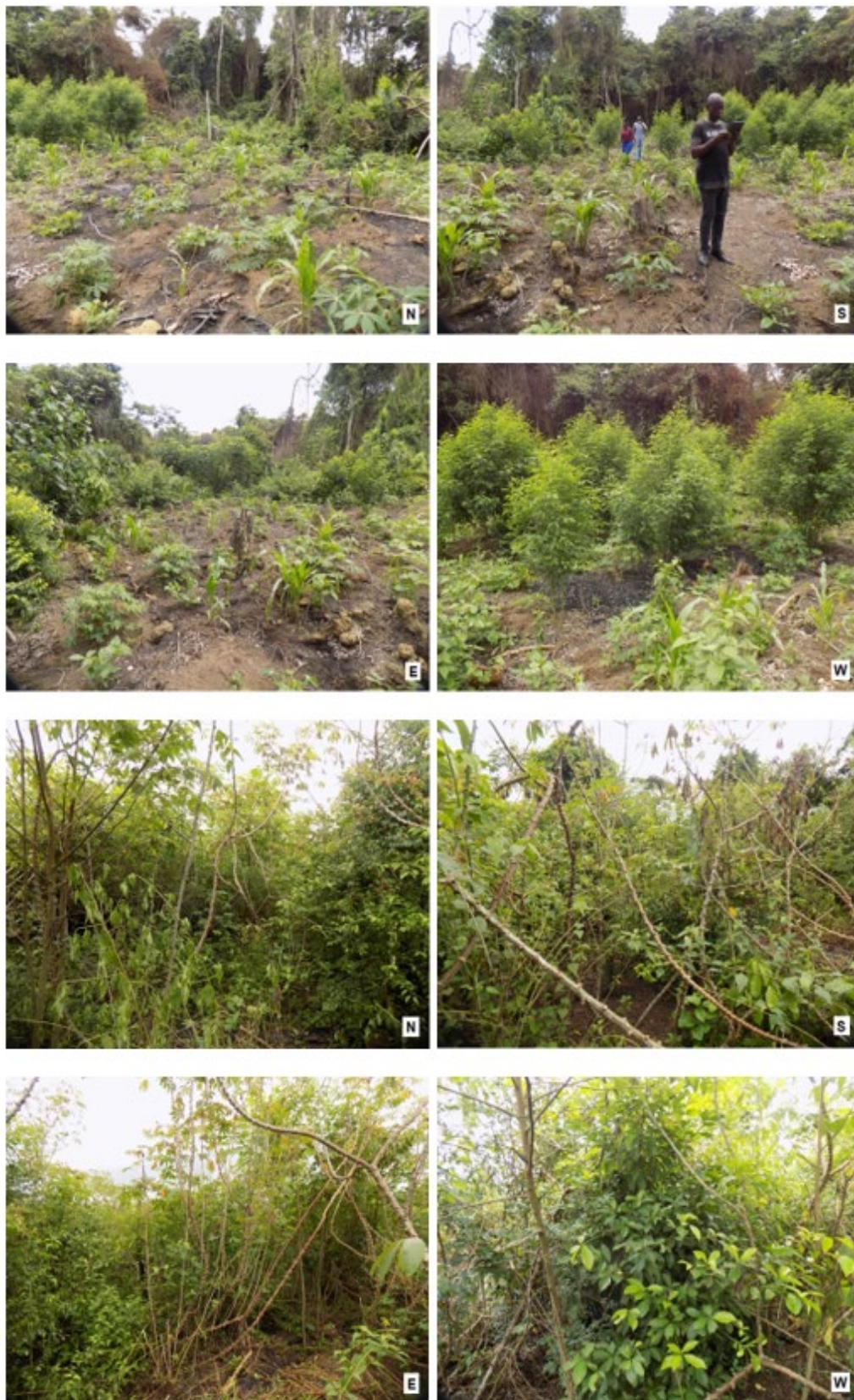
Figure 31: Mosaic of cropland and forest (mosaic forest/croplands GLC2000 habitat) observed within the AoI at FLO13 and FLO15 Survey Points.

7.3.2.1   Habitat threats

The most important threats to these habitats are the unsustainable practice of slash-and-burn technique for household cultivation for subsistence and small scale local commercial use, the bushmeat hunting for subsistence and small-scale commercial purposes using traditional methods, and the illegal wildlife trade within the province and across the border (more information in the paragraph 7.3.6).

These threats were recorded at several sampling points, the most common being the practice of slash-and-burn technique. Charcoal production has also been observed in areas with a high degree of logging and habitat degradation. Poaching is a recurring phenomenon in which animals are slaughtered daily, with an emphasis on mammals and these are sold on the main road that connects Cabinda to Cacongo, close to the entrance to the New Airport. In the right bank of the Chiloango River, it was found that there were several minefields too (Figure 32 and Figure 33).

Figure 32: Habitat threats recorded during field surveys. A and b) slash and burn technique; c) erosion; d) agricultural fields; e) Ammunition cartridge as evidence of hunting practice; f) mining extraction; g) wood arranged for charcoal production; h) minefield.

Figure 33: Artisanal lethal trap built by the local population and observed during the Mammals field survey (*on the left*) and example of bushmeat market in Cabinda at an area of less than 10km from the Project (*on the right*).

7.3.3   Flora species

The Study Area belongs to the Western Congolian forest-savanna mosaic (see paragraph 7.1.1). The high habitat diversity present explains, along with other evolutionary causes, the presence of a high species diversity and the presence of a high number of Species of conservation concern, characterized by a high conservation value.

The main species of the primary forest are generally *Gosswilerodendron balsamiferum*, *Pycnanthus angolensis*, *Staudtia kamerunensis*, *Piptadeniastrum africanum*, *Zanthoxylum gilletii*, *Guibourtia arnoldiana*, *Petersianthus macrocarpus*, *Entandrophragma angolensis*, *Canarium schweinfurthii*, *Ceiba pentandra*, *Symphonia globulifera*, *Bombax reflexum*, *Coula edulis*, *Lannea welwitschii* and *Oxystigma mafuta*. In secondary forests resulting from abandonment in agricultural fields, fast-growing species are dominant, such as *Mussanga cecropioides*, *Trema guineensis*, *Ricinodendron heudelotii*, *Harungana madagascariensis*, *Vernonia conferta*, *Pteleopsis myrtifolia* and *Myrianthus arboreus*.

The bushy savanna consists mainly of *Hymenocardia acida*, *Piliostigma thonningii*, *Anonna senegalensis* and *Bridelia micrantha*, as well as the grasses of the genera *Hyparrhenia*, *Andropogon*, *Loudetia* and *Digitaria*. Almost all savannah species have adaptations against fires, a seasonal disturbance factor in this habitat. Areas

that support important ecological processes, habitats, and species, and are therefore relevant from a biodiversity conservation perspective may be legally protected (Protected Area) or not.

Based on literature review and according to the IUCN Global data, 282 flora species were identified as potentially present within a buffer of 50 km from the Project site (summarized in Table 6), with 107 directly observed during the two field surveys. The complete list of species observed and potentially present in the AoI is available in APPENDIX A (Table 18), and a photographic record of the field survey is available in APPENDIX B.

In addition, a survey of tree within the Project direct footprint has been undertaken, and the results are available in a file developed by OEC namely "ATT.3.0. Levantamento de arvores-Layout.1.pdf".

Table 6: Flora species assessment with IUCN risk categories[14].

Class	LC and NT	CR, EN and VU	DD and NE
Gnetopsida	1	0	0
Liliopsida	90	2	16
Magnoliopsida	105	15	49
Polypodiopsida	4	0	1
Total	*200*	*17*	*66*

According to the Global IUCN Red List, 17 flora species are identified as threatened, endangered and/or vulnerable. Furthermore, 66 flora species are listed as DD (data deficient) or not evaluated (NE). In addition, 18 species are identified as VU (vulnerable) according to the National Red List (Ambiente, 2018). No restricted range and/or endemic species have been identified as potentially present within the AoI.

The species identified as of potential conservation concern due to their threatened status are listed in the following Table 7 with information on habitat preference, global and national conservation status. If the species was not observed in the field, an expert-based analysis of the likelihood of presence within the AoI of 2km have been investigated.

Table 7: Flora species of conservation concern potentially present or observed in an AoI of 2 km.

Species	Habitat preference	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI
Albizia glaberrima	Most found in semi-deciduous forest, but sometimes also in logged-over evergreen forest and in evergreen bushland. It is often characteristic of secondary forest. Historical presence in Cabinda.	LC	VU	L	Possible
Autranella congolensis	Is a rare non-pioneer light demanding species that occurs mainly in old semi-deciduous rainforests. Historical presence in tropical humid forest in Cabinda.	EN	VU	L	Possible

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[14] CR= critically endangered, EN= endangered, VU= vulnerable, NT= near threatened, LC= least concern, DD= data deficient, NE= not evaluated.

Species	Habitat preference	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI
Bobgunnia fistuloides (syn. Swartzia fistuloides)	Dense moist forests and deciduous forests at elevations from 390 - 500 metres. Historical presence in tropical humid forest in Cabinda.	LC	VU	L	Not possible
Brachystegia spiciformis	In a variety of habitats from coastal to upland, generally in deciduous woodlands and open forest, on hill slopes and riverbanks at elevations of 50 - 2000 metres. Freely draining gravel escarpments and near streamsides in rainforests. Historical presence in tropical humid forest in Cabinda.	LC	VU	L	Possible
Caesalpinia leostachya	The native range of this genus is South America. Atlantic rainforest and the dry land forest of northeast Brazil, favouring valley bottoms subject to seasonal flooding and is also found in lowland areas in the dry land forest. Introduced in Cabinda.	NE	VU	L	Possible
Ceiba pentandra	The native range of this species is Mexico to Tropical America. An emergent tree in various types of moist evergreen and deciduous forests, including those subjects to seasonal inundation, as well as in dry forests and gallery forests. As a pioneer species, it mostly occurs in secondary forests. Historical found in tropical humid forest of Cabinda.	LC	VU	O	-
Corynanthe macroceras (syn. *Pausinystalia macroceras*)	An understorey tree in forests. Historical found in Cabinda.	LC	VU	L	Possible
Dalbergia latifolia	The native range of this species is Indian Subcontinent, Andaman Islands, Jawa. It is a tree and grows primarily in the seasonally dry tropical biome. Historical found in tropical humid forest of Cabinda.	VU	VU	L	Possible

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Species	Habitat preference	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI
Diospyros mespiliformis	Riparian forest, more rarely on termite mounds or rocky outcrops or in dry semi-evergreen forest at elevations of 60 - 1,370 metres. Historical found in Cabinda tropical humid forest.	LC	VU	L	Possible
Entandrophragma utile	It is a tree and grows primarily in the wet tropical biome. Historical found in tropical humid forest of Cabinda.	LC	VU	L	Possible
Eriocaulon stipantepalum	Probably perennial herb, growing at the margins of small pools and flooded depressions in grassland, on iron-rich ground; 1,250 m above sea level.	EN	-	L	Not possible
Gambeya africana	It is commonly found in lowland rainforest vegetation, near rivers. Historical found in tropical humid forest of Cabinda.	LC	VU	L	Possible
Genlisea angolensis	It is a hydro perennial and grows primarily in wet meadows, usually in shady stagnating waters.	EN	-	L	Not possible
Gnetum africanum	Understorey layer of humid tropical rainforests, mostly at the periphery of primary forest and in secondary forest.Thrives in a wide range of habitats, including farm fallows or abandoned farmland, secondary forests, and closed forest. Historical found in Cabinda.	NT	VU	L	Possible
Gossweilerodendron balsamiferum (syn. *Prioria balsamiferum)*	It grows in mature little-disturbed lowland rainforest, at elevations up to 600 metres.	EN	-	L	Possible
Inversodicraea cristata	Annual aquatic herb submerged or not in fast water of waterfalls, fixed by a thallus on rocks or any other hard object.	VU	-	L	Not possible
Khaya anthotheca	A canopy tree of lowland rainforest and riverine fringe forest, from sea level to about 1,500 metres. Prefers terraces and stable, gently sloping riverbeds in riparian forests; grows well on adjacent colluvial slopes at margins of floodplains. Historical found in tropical humid forest of Cabinda.	VU	VU	L	Possible

Species	Habitat preference	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI
Ledermanniella bifurcata	Small annual aquatic herb, submerged, fixed on rocks in the fast water of waterfalls and rapids.	VU	-	L	Not possible
Ledermanniella schlechteri	Aquatic herb, annual, submerged or not, growing fixed on rocks in waterfalls and rapids. It grows fixed by a thallus on rocks or any other hard object.	VU	-	L	Not possible
Milicia excelsa	Deciduous, semi-deciduous or evergreen, primary or secondary forest, with an apparent preference for drier forest types, at elevations up to 1,200 metres. Often occurs in gallery forest and in forest islands or as lone trees in savannah regions Historical found in tropical humid forest of Cabinda.	LC	VU	O	-
Nymphoides tenuissima	This is an annual aquatic herb that floats in small, temporary marshes, not deep (25-30 cm), on laterite or on rocks.	EN	-	L	Not possible
Psilotrichum axilliflorum	Perennial herb of dry or flooded moist primary forests and forests along rivers. One collection said to be from a termite mound community in savanna grassland.	EN	-	L	Possible
Pterocarpus angolensis	Found in all types of woodland and wooded savannah. Typically found in so-called miombo woodland with *Brachystegia* and other deciduous trees, in wooded grassland and savannah, at elevations from sea-level up to 1,650 metres. Historical occurrence in Cabinda.	LC	VU	L	Possible
Rhizophora mucronata	By the coast in brackish and saline areas of depositing shores and marshes along the banks of tidal creeks, in estuaries and on low coastal areas flooded by normal, daily, high tides. Historical found in Cabinda.	LC	VU	L	Not possible
Ricinodendron heudelotii	Fringing, deciduous, and secondary forests, common	LC	VU	O	-

Species	Habitat preference	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI
	throughout the semi-dry wooded-savannah zone. Rain forests, but is typical of the more open, secondary formations and is common on abandoned farmland. Historical found in tropical humid forest of Cabinda.				
Rotala robynsiana	It is found on rocky river borders.	CR	-	L	Not possible
Rotala smithii	Herb growing into the mud, at the marshland borders.	VU	-	L	Possible
Santalum album	The native range of this species is Jawa to N. Australia. It is a shrub or tree and grows primarily in the wet tropical biome. Probably introduced, or wrong nomenclature. Historical found in tropical humid forest of Cabinda.	VU	VU	L	Possible
Stenandrium gabonica	It grows primarily in the wet tropical biome. Forest shrub, found in shady situations along rivulets on the river.	VU	-	L	Possible
Turraeanthus africana	It is described as a tree of the rain forest. Historical found in Cabinda tropical humid forest.	VU	-	O	-
Xyris exigua	This species is found in seasonal streams. It is an hemicryptophyte.	CR	-	L	Not possible

The species of conservation concern observed during the two field seasons are: *Ceiba pentandra*, *Milicia excelsa*, *Ricinodendron heudelotii* and *Turraeanthus africana* and, they are listed as VU (Vulnerable) according to IUCN Global Criteria and/or the National Red List. However, it should be noted that the species *Ceiba pentandra* is an introduced species to the country. In fact, this forest species is native from Mexico to Tropical America.

7.3.3.1   *Invasive alien species*

Due to the high human pressure that was verified during the field surveys, through seasonal fires, cutting down of trees to obtain wood and charcoal, the conversion of natural areas into agricultural, etcetera, all these activities lead to the ease of introduction of invasive species and invasive alien species (IAS). IAS are plants that are introduced into places outside their natural range, negatively impacting native biodiversity, ecosystem services or human well-being. IAS pose a threat to biodiversity and related ecosystem services by heavily impacting native species as well as the structure and function of ecosystems through alteration of habitats, predation, competition, the transmission of diseases, the replacement of native species throughout a significant proportion of range and through genetic effects by hybridisation.

Based on literature review[15], the 5th National Report on Biodiversity in Angola (years 2007-2012 and 2019-2025) and the Executive Decree n. 252/18 of Angola Ministry of the Environment, the invasive alien flora species observed in the Area of Influence are reported in the following Table 8.

Table 8: Invasive alien species observed in the Area of Influence during the field surveys.

Species name	Common name	Survey Point	Native range	Invasiveness
Bambusa vulgaris *	Common bamboo	FLO_09	Asia	It has the potential to invade relative unaltered forests moving along streams.
Chromolaena odorata	Siam weed	FLO_01, FLO_07, FLO_08, FLO_11, FLO_13, FLO_15, FLO_18, FLO_19, FLO_20	Central and South America	It is considered one of the world's worst weeds. With high negative impact on native fauna and flora (category I).
Dioscorea alata	White yam	FLO_08, FLO_11, FLO_14, FLO_18	Southeastern Asia	In some countries is classified as an invasive plant category I.
Murraya paniculate *	Orange jessamine	FLO_09, FLO_15, FLO_16	Asia	In some countries is listed as a category 2.
Passiflora foetida	Red fruit passionflower	FLO_18	Central America	It is a serious weed of maize and rubber, and other plantations.
Pteridium aquilinum	Bracken	FLO_19	Probably native of Africa	It is a cosmopolitan weed that readily spreads into pasture and marginal areas and is favoured by fire and soil acidity.
Spondias mombin	Red mombin	FLO_01	Mexico and Central America	It is one of the most important fruit crops. Probably introduced but not categorized as invasive.
Tithonia diversifolia	Mexican sunflower	FLO_19	Mexico and Central America	It is widely cultivated as ornamentals and have escaped to become invasive weeds in many tropical and subtropical areas around the world. Quickly forms dense stands with the potential to outcompete native vegetation and thus prevent the recruitment and growth of native plant species (category I).

Category I: species classified as an invasive plant with the potential to modify and collapse native plant communities by displacing native species, changing community structures, and altering ecological functions.
Category II: species classified as potentially an invasive plant, naturalized, and spreading in some areas, but still not altering plant communities.

* other records of this species have been recorded during the field survey on the Project footprint undertaken by the client. More information are available on the external appendix.

Specific measures for the control of these IAS are described in the Invasive Alien Species Management Plan (IASMP).

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[15] **https://www.cabidigitallibrary.org/** and **https://www.gbif.org/**

7.3.4   Herptile and freshwater species

Cabinda is home to a wide variety of animal species native to tropical Central Africa. However, there is very little information in the available literature on the species of invertebrates, amphibians or reptiles that occur in Cabinda Province, although a high diversity of species is expected, particularly in the Mayombe forest located at approx. 60 Km.

Based on literature review and according to the IUCN data, 579 herptile and freshwater species were identified as potentially present within a buffer of 5 km from the Project site (Table 9), with 18 directly observed during the field survey. The complete list of species observed and potentially present in the AoI is available in APPENDIX A (Table 19).

Table 9: Herptile and freshwater species assessment with IUCN risk categories[16]

Class	LC and NT	CR, EN and VU	DD and NE
Insecta	148	0	1
Malacostraca	18	0	9
Amphibia	45	0	7
Actinopterygii	149	7	9
Chondrichthyes	0	3	0
Gastropoda	0	0	1
Reptilia	117	9	0
Sarcopterygii	2	0	0
Total	*479*	*19*	*27*

According to the Global IUCN Red List, 19 species are identified as threatened, endangered and/or vulnerable. Furthermore, 27 species are listed as DD (data deficient) or not evaluated (NE). In addition, 7 species are identified as VU or EN-CR according to the National Red List (Ambiente, 2018). No restricted range and/or endemic species have been identified as potentially present within the AoI.

The species identified as of potential conservation concern due to their threatened status are listed in the following Table 10 with information on habitat preference, global and national conservation status. If the species was not observed in the field, an expert-based analysis of the likelihood of presence within the AoI of 5 km have been investigated.

Table 10: Herptile and freshwater species of conservation concern potentially present or observed in an AoI of 5 km.

Species	Habitat	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI (5 km)
Amphilius mamonekenensis	It is a species of ray-finned fishes in the family loach catfishes, found in inland	VU	-	L	Possible

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[16] CR= critically endangered, EN= endangered, VU= vulnerable, NT= near threatened, LC= least concern, DD= data deficient, NE= not evaluated.

Species	Habitat	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI (5 km)
	wetlands and in permanent rivers/streams/creeks (includes waterfalls).				
Bitis gabonica	This nocturnal snake is found in moist and dry forests, including mature as well as secondary forests and forest-plantation mosaics consisting of Guinean savanna, rainforest, and anthropogenic habitats (including both subsistence and agro-industrial plantations).	VU	-	L	Possible
Bitis nasicornis	This species is mostly associated with forests and swamp forest, but while usually absent from deforested areas it also occurs in vegetated anthropogenic habitats including farm bush, and cacao, coffee, and rice plantations.	VU	-	L	Possible
Carcharhinus leucas	The Bull Shark is demersal and pelagic in tropical, sub-tropical, and temperate waters both inshore and offshore, usually near the seabed from the surf line to a depth of 164 m but mostly in shallower waters to ~30 m depth.	VU	-	L	Not possible
Caretta caretta	The Loggerhead Turtle nests on insular and mainland sandy beaches throughout the temperate and subtropical regions worldwide. Like most sea turtles, Loggerhead Turtles are highly migratory and use a wide range of broadly separated localities and habitats during their lifetimes. Upon leaving the nesting beach, hatchlings begin an oceanic phase in major current systems (gyres) that serve as open-	VU	VU	L	Possible

Species	Habitat	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI (5 km)
	ocean developmental grounds.				
Chrysichthys dendrophorus	Is a demersal species. It is adapted to a life under stones of rocky bottoms of rapids and is probably only known from the main channel.	VU	-	L	Possible
Crocodylus niloticus	Being a widely distributed species, the Nile crocodile is found in a wide variety of habitat types, including large lakes, rivers, and freshwater swamps.	LC	VU	L	Possible
Cycloderma aubryi	*Cycloderma aubryi* is primarily an inhabitant of large freshwaters within the tropical rainforest biome, with a few records known from the wet savanna region to the south. It is occasionally found in small streams and temporary pools. Within larger water bodies, it specifically seeks out areas with emerging shrubs and vegetation in sheltered coves and embayment, while reedbeds are also used.	VU	-	L	Possible
Dermochelys coriacea	*D. coriacea* is an oceanic, deep-diving marine turtle inhabiting tropical, subtropical, and subpolar seas.	VU	EN-CR	L	Not possible
Enteromius collarti	This is a benthopelagic species living in freshwater wetlands.	VU	-	L	Possible
Enteromius stauchi	This is a benthopelagic species living in freshwater wetlands.	EN	-	L	Possible

Species	Habitat	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI (5 km)
Eretmochelys imbricata	Hawksbills nest on insular and mainland sandy beaches throughout the tropics and subtropics.	CR	VU	L	Possible
Ethmalosa fimbriata	This euryhaline, catadromous species is considered pelagic and occurs in coastal waters at fairly shallow depths, lagoons, and estuaries, and sometimes in freshwater more than 300 km upriver.	LC	VU	L	Possible
Fontitrygon ukpam	The Thorny Whipray is demersal in shallow coastal waters (likely to 30 m depth), estuaries, and freshwater river systems and can be found more than 240 km upstream from the coast.	CR	-	L	Possible
Labeobarbus roylii	*Labeobarbus* species have spawning migrations. This species is benthopelagic living in freshwater wetlands.	EN	-	L	Possible
Mecistops cataphractus	This species prefers forested rivers and other densely vegetated bodies of water (*e.g.* reservoirs and freshwater lagoons), but has also been found in sparsely vegetated, gallery habitats within savanna woodland.	CR	VU	L	Possible
Neolebias spilotaenia	Wetlands (inland) - pelagic species.	VU	-	L	Possible
Notoglanidium pallidum	Wetlands (inland), permanent rivers, streams, creeks. This is a demersal species.	VU	-	L	Possible
Osteolaemus tetraspis	Terrestrial, freshwater (inland waters). Terrestrial nest sites and basking areas.	VU	-	L	Possible

Species	Habitat	Global IUCN Status	National Red List	Observed or Literature	Likelihood of presence in the AoI (5 km)
Pristis pristis	The Largetooth Sawfish is a euryhaline species that occurs at depths of 0–60 m, with juveniles occupying freshwater and estuarine habitats, and adults occurring in both estuarine and coastal waters.	CR	-	L	Possible
Python sebae	This snake is closely associated with swampy areas and the banks of permanent watercourses.	NT	VU	O	-
Trionyx triunguis	*Trionyx triunguis* inhabits fairly deep water in permanent lakes, rivers, estuaries, coastal lagoons, and coastal waters, down to 80 m depth.	VU	-	L	Possible

Due to the difficulty found during the first field survey, and the need to better investigate the area with new survey points, it was decided to carry out another field survey at the same points/transects defined for the mammals, to maximize the coverage of the study area at 5 km.

During the field survey, only two species of odonata (Class Insecta) were found, and in only one case was it possible to identify the species. The taxa found correspond to *Palpopleura lucia*; *Hadrothemis* sp. (Figure 34).

Figure 34: Odonata found during field survey: *Palpopleura lucia*; *Hadrothemis sp.*

Regarding freshwater crustaceans (Class Malacostraca), research using a dip net allowed the observation of 4 species, namely *Caridina togoensis*, *Sudanonautes africanus*, *Macrobrachium* sp. and *Callinectes* sp. (Figure 35).

Figure 35: Freshwater crustaceans found during field survey: *Caridina togoensis*, *Sudanonautes africanus*, *Macrobrachium sp.* **and** *Callinectes sp.*

Using the dip net, two genera, namely *Lymnaea* and *Biomphalaria*, of freshwater molluscs (Class Gastropoda) were identified (Figure 36).

Figure 36: Freshwater molluscs found during field survey: *Lymnaea sp.* **and** *Biomphalaria sp.*

Regarding the ichthyofauna (Class Actinopterygii), two specimens of fish widely distributed in Angolan rivers were observed, namely tilapia (*Coptodon guineensis*) and catfish locally known as bagre (*Chrysichthys nigrodigitatus*) as shown in the Figure 37.

Figure 37: Ichthyofauna recorded in the field study: *Chrysichthys nigrodigitatus* **and** *Coptodon guineensis***.**

Although there are numerous species of amphibians in the province of Cabinda, it was only possible to confirm the presence of four species (Class Amphibia), namely *Sclerophrys pusilla*, *Cardioglossa leucomystax* (Figure 38), as well as *Hyperolius* sp. and *Xenopus* sp.

This result underestimates the current presence of this Class, but it must consider the impossibility for the team to explore the most suitable areas due to the lack of safety conditions.

Figure 38: Amphibians photographed during the field study: *Sclerophrys pusilla* **and** *Cardioglossa leucomystax***.**

As with amphibians, also reptiles (Class Reptilia) are considered under sampled, with 7 species identified through direct observation (during transects walkover, photo-trapping and bushmeat markets). Thus, the following species were identified: *Agama agama*, *Gerrhosaurus nigrolineatus*, *Gerrhosaurus multilineatus*, *Philothamnus angolensis, Python sebae* (dead adult individuals were seen in bushmeat markets) *Trachylepis affinis*, and *Varanus niloticus*. (Figure 39, Figure 39 and Figure 41).
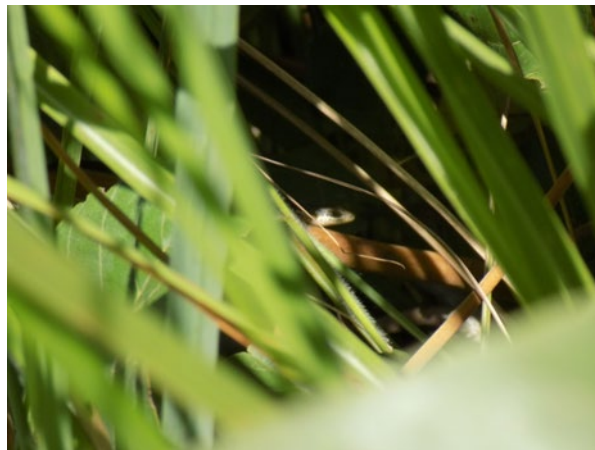
Figure 39: Angola Green Snake (*Philothamnus angolensis*) photographed in the field study.

Figure 40: Central African rock python (*Python sebae*) photographed in a bushmeat markets during the second field survey.

Figure 41: Reptiles observed during the second field surveys. a) *Varanus niloticus*; **b)** *Trachylepis affinis*; **c)** *Agama agama*; **d)** *Agama agama* **(female); e)** *Gerrhosaurus nigrolineatus*; **f)** *Gerrhosaurus multilineatus***.**

At the same time, through a series of information gathered from the local population, it was found that *Dendroaspis jamesoni*, *Python sebae* and *Varanus niloticus* are also common.

P. sebae is the only species of conservation concern, classified as NT (nearly threatened) by the IUCN Global Red List and VU (vulnerable) by the Angola National Red List.

7.3.5   Birds and bats

The Project AoI entirely falls within the East Atlantic Flyway (Figure 42), which extends in Africa-Eurasia from Arctic regions to the southern tip of Africa.

It is an important migration pathway, used especially by waders and shorebirds. An estimated 90 million birds, including many million waterbirds, use the flyway for their annual migration, as they migrate between their northern breeding grounds (breeding season) to the warmer wintering grounds (non-breeding season) further south and back again. Many trans-equatorial migratory waterbirds fly beyond the southern tropic, such as *Egretta gularis* (western reef-egre), *Pluvialis squatarola* (grey plover), *Charadrius hiaticula* (common ringed plover), *Limosa limosa* (black-tailed godwit), *Limosa lapponica* (bar-tailed godwit), *Numenius phaeopus* (whimbre), *Tringa erythropus* (spotted redshank), *Tringa nebularia* (common greenshank), *Arenaria interpres* (ruddy turnstone), *Calidris alba* (sanderling), *Calidris minuta* (little stint), *Calidris ferruginea* (curlew sandpiper), *Thalasseus maximus* (royal tern), *Sternula albifrons* (little tern)[17].

In addition, the East Atlantic Flyway is also covered by the African-Eurasian Migratory Waterbird Agreement (AEWA), developed under the framework of the Convention on Migratory Species (CMS) and administered by the United Nations Environment Programme (UNEP). The AEWA is essential for the conservation and management of migratory waterbird species ecologically dependent on wetlands for at least part of their annual cycle, and the habitats across Africa, Europe, the Middle East, Central Asia, Greenland, and the Canadian Archipelago on which they depend[18].

Figure 42: East Atlantic Flyway in Africa-Eurasia.

Besides this well-known intercontinental migration, there is a less well-known phenomena, the intra-African migration, which seem to depend on rainfall patterns and/or insect outbreaks (Klaus, 2005).

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[17] http://www.groms.de/

[18] https://www.unep-aewa.org/en/document/aewa-plan-action-africa-2019-2027-0

In addition to the bird migration, many species of bats are migratory and, therefore of considerable geographically importance to habitats and ecosystems (Heimo, 2018). Bats migrate thousands of kilometres over savanna and open land, dispersing seed and regenerating landscapes and forest. Very little is known about these migratory routes, however bats from west to east Africa, every year, between October and December, descend on the Kasanka National Park to feast on an abundance of fruit[19].

In Cabinda, the avifauna is very rich, with continental species that are part of the fauna of the forest, savannah and shrubby galleries that occur in the region, the most charismatic being the gray parrot (*Psittacus Erithacus*). Seabirds are also a group with several species present, since the vast seacoast of the Cabinda region is rich in different preferred habitats for birds.

Since roughly the beginning of the 2000s, information on birds in Angola has been gathered at an increasing race, with new species added to the list and a constant increase in publications on their biogeography and biology. With about 940 species, Angola has an impressive diversity of birds, including 16 endemic species and several rare and little-known ones. There are many areas that deserve study in the future, not only to collect more data on rare and endemic species, but also to carry out local surveys on bird communities, their movement towards continental birds, identify major threats to avifauna due to the land use change (along with suggested corrective measures) and much more.

According to the bibliographic research, numerous species occur in the region, such as *Gypohierax angolensis*, *Ploceus* spp., *Lophoceros fasciatus*, *Halcyon senegalensis*, *Merops bullockoides*, *Merops variegatus*, *Numida Meleagris*, *Casmerodius albus*, *Corvus albus*, *Euplectes albonotatus*, *Streptopelia capicola*, *Threskiornis aethiopicus*, *Uraeginthus angolensis*, *Vidua macroura*, *Ciconia abdimii*, *Crecopsis egregia*, *Euplectes hordaceus*, *Cecropis abyssinica*, *Upupa africana*, *Actitis hypoleucos*, *Burhinus capensis*, among others (Mills & Melo, 2013).

The Mayombe forest region in Cabinda includes one of the 23 Important Bird Areas (IBA) as defined for Angola by Birdlife International (2012) [20]. The site has the highest number of species in Angola that are restricted to the Guinea–Congo Forests biome but the avifauna in this area is virtually yet to be studied. Furthermore, the coastal area between Cacongo (Lândana) and Massabi Lagoon has been suggested as a potential IBA, but there is not enough information to properly assess its relevance in terms of avifauna diversity (Huntley, et al., 2019).

Based on literature review and according to the IUCN data, 481 bird species were identified as potentially present within a buffer of 50 km from the Project site (Table 11), with 95 directly observed during the two field survey, and 34 bats species were identified with 2 direct observation during the two field survey. The complete list of species observed and potentially present in the AoI is available in APPENDIX A (Table 20).

Table 11: Birds and bats species assessment with IUCN risk categories.

Class	LC and NT	CR, EN and VU	DD and NE
Aves	473	6	2
Chiroptera	33	0	1
Total	*506*	*6*	*3*

According to the Global IUCN Red List, 6 species of birds are identified as threatened, endangered and/or vulnerable. Furthermore, 3 species are listed as DD (data deficient) or not evaluated (NE). In addition, 5 species

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[19] https://www.theguardian.com/environment/2021/jan/05/why-the-worlds-biggest-mammal-migration-is-crucial-for-africa-photo-essay-aoe

[20] https://datazone.birdlife.org/country/angola/ibas

are identified as VU or EN-CR according to the National Red List (Ambiente, 2018). No restricted range and/or endemic species have been identified as potentially present within the AoI.

The species identified as of potential conservation concern due to their threatened status are listed in the following Table 12 with information on habitat preference, global and national conservation status. If the species was not observed in the field, an expert-based analysis of the likelihood of presence within the AoI of 50 km have been investigated.

Table 3: Birds species of conservation concern potentially present or observed in an AoI of 50 km.

Species	Habitat	Global IUCN Status	National Red List	Observed Literature	Likelihood of presence in the AoI (50 km)
Ardeola rufiventris	This species is mainly sedentary, although it may make partial migratory movements in relation to seasonal flooding of river floodplains. It breeds during the rainy season, or when flooding is at a peak (which may be in the early dry season). The species inhabits seasonally flooded grasslands, marshes, floodplains and inland deltas, shallow water along riverbanks and lake shores, stands of papyrus, reedbeds and rice-fields.	LC	EN-CR	L	Possible
Cisticola rufilatus	Its natural habitat is dry savannah, forest-subtropical/tropical dry, shrublands and artificial and arable land.	LC	VU	O	-
Colius castanotus	The red-backed mousebird prefers less dense forests than those favourable to other mousebirds. Shrubs are also favoured, especially with thorns, to keep predators away from their nests. The red-backed mousebird's nest structure is characterized as "cup-like, thick and untidy state".	LC	VU	O	-
Morus capensis	This species is a seabird. This species is not strictly migratory, and the majority of birds remain within 500 km of their breeding site year-round, some (mainly adult males) continuing to use the breeding grounds as roosting sites throughout the non-breeding season. Breeding It prefers to nests on flat or gently sloping open ground on offshore islands but will also use island cliffs as well as man-made structures such as guano platforms.	EN	-	L	Possible

wsp

Species	Habitat	Global IUCN Status	National Red List	Observed Literature	Likelihood of presence in the AoI (50 km)
Phalacrocorax capensis	This species is usually found in the Benguela Current less than 10 km from the coast although it does occasionally range as far as 70km offshore. During both the breeding and the non-breeding seasons it inhabits cliffs and ledges on the mainland and on offshore islands. It is occasionally found in the brackish waters of coastal lagoons, estuaries, and harbours, but does not use these habitats for breeding.	EN	-	L	Possible
Platysteira albifrons	It is found in dry thicket in woodland, gallery forest and at the edges of mangrove forest. The species is monogamous and territorial, but nothing else is known of its breeding behaviour. Juveniles have been observed in November.	NT	VU	L	Possible
Ploceus subpersonatus	In coastal Cabinda, it is found in rank grass in clearings in secondary forest and at the edge of marshes. It inhabits mangrove forests.	VU	-	L	Possible
Psittacus erithacus	Although typically inhabiting dense forest, they are commonly observed at forest edges, clearings, gallery forest, mangroves, wooded savannah, cultivated areas, and even gardens, but it is not clear whether these are self-sustaining populations. At least in West Africa, the species makes seasonal movements out of the driest parts of the range in the dry season.	EN	EN-CR	O	-
Terathopius ecaudatus	It inhabits open country, including grasslands, savanna and subdesert thornbush from sea level to 4,500 m but generally below 3,000 m.	EN	-	L	Possible
Thalassarche chlororhynchos	This species is a seabird. It builds nests built on tussock grass, on rocks and under trees.	EN	-	L	Possible

During the first field survey, only 33 species were identified (Figure 43 and Figure 44). The Gray Parrot (*Psittacus erithacus*) has the most unfavorable conservation status (EN – Endangered) due to loss of habitat for deforestation and the capture of juveniles and eggs for the trafficking of captive animals. While the sampling effort of the first field survey seems to underestimate the avifauna composition of the AoI, the 35 Survey Points

as well accidentally recording made by the team while moving between points and the recording from the camera traps, made it possible to confirm the occurrence in the AoI of 62 species (new sightings).

Figure 43: *Meropus gularis, Passer griseus, Corvus Albus, Ciconia abdimii, Euplectes macroura* and *Ploceus pelzelni*, photographed in the field.

Figure 44: *Euplectes hordeaceus, Urocollus indicus, Streptopelia semitorquata, Vidua macroura, Euplectes macroura* and *Burhinus capensis*, photographed in the field.

All the species recorded are assessed by the IUCN Global Red List as LC (least concern). However, *Cisticola rufilatus* and *Colius castanotus* are assessed as VU (vulnerable) according to the Angolan Red List.

Given the methodological design adopted, it was possible to verify the presence of places where birds congregate. For example, at the Survey Point BAB_33, which corresponds to Massabi Lagoon, there was a big congregation of waterbirds, including large ardeids. Of note is the presence of several dozen *Phalacrocorax carbo* subsp. *lucidus* (Figure 45). Moreover, the camera trap placed at the Survey Point MAM_03 took a photo of a high concentration of feeding flock of *Ciconia microscelis* (Figure 46).

Extra photographic records of the second field survey are presented in the APPENDIX C.

Figure 45: Large congregation of water birds at the Massabi Lagoon (Survey Points BAB_33).

Figure 46: Feeding flock of Ciconia microscelis at MAM_03 captured with CAM_07, during the second field survey.

About bats, during the first field survey only one species was identified during the <u>roosting places</u> surveys, namely *Epomophorus wahlbergi* (Figure 47).

During the second field survey, with the help of a bat detector, 5 acoustic records were registered (probably of 5 distinct species). However, due to the very low available data for this country, it was only possible to identify one species, namely *Rhinolophus landeri*.

Figure 47: *Epomophorus wahlbergi,* photographed in the field.

7.3.6   Mammals

In Cabinda, small mammals such as *Thryonomys swinderianus*, or small carnivores such as *Civettictis civetta* or *Genetta maculata*, are common in the open forest and/or plain areas. Based on a desktop analysis, also species such as the small antelopes *Cephalophus* spp., *Hyemoschus aquaticus* and *Philantomba monicola*, *Syncerus caffer*, *Phataginus* sp., *Tragelaphus spekei*, *Potamochoerus porcus*, *Nandinia binotata*, flying squirrels (*Anomalurus* spp.) and a variety of tree squirrels, as well as numerous species of rodents and bats, occur in the region (Ron, 2017; Ambiente, 2018; USAID, 2008).

The African elephant (*Loxodonta africana*), classified as EN - Endangered, by the IUCN, occurs in the Province of Cabinda, with sightings recorded throughout the northwest of Cabinda, especially in areas with forest cover (Figure 48). Most individuals of this species live north of the Lândana-Belize road. Less frequently, some individuals occur south of this road, between Buco-Zau and the Greater Congo and in an area south of the Chiloango River. According to the Provincial Secretariat for Land Planning, Urbanism and Environment of Cabinda (SPOTUA), the natural crossing area for elephants is located between Dinge and Inhuca. In the Mayombe forest, the Critically Endangered African Forest Elephant (*Loxodonta cyclotis*) also occurs. It is likely that the african elephants belong to a cross-border populations within the Republic of Congo or the DRC (Heffernan, 2005).
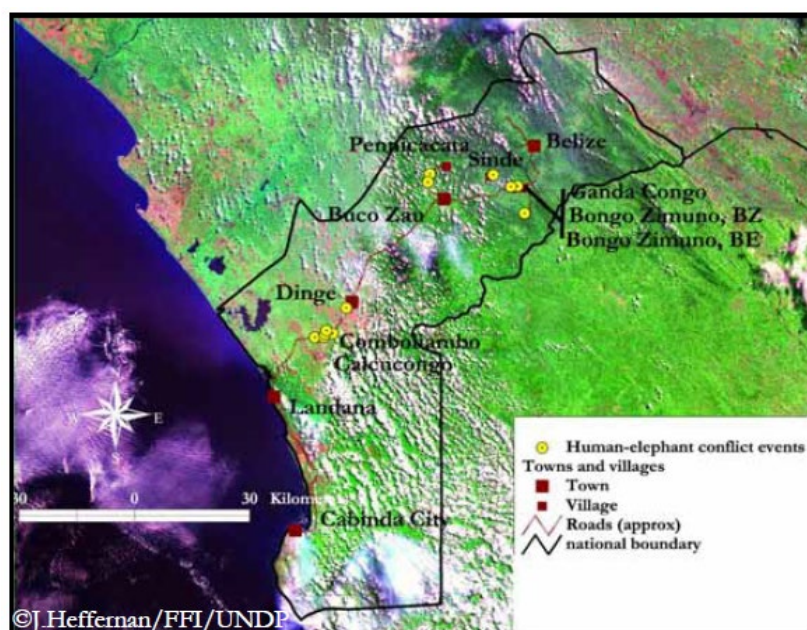
Figure 48: Data on human-elephant conflict events.

The potential presence of great apes (GAs) is the most relevant point of concern because these species can trigger many criteria for critical habitat. In the Mayombe forest the critically endangered western gorilla (*Gorilla gorilla*) occurs, and it is found in the extreme south of its range. Although sightings are rare, as these animals tend to prefer forested habitat with dense growth of low vegetation (and swampy forests), it is assumed that gorillas are well distributed throughout the Mayombe forest region of Cabinda (Ron, 2017; Ron, 2013)). Also noteworthy is the presence in the region of chimpanzees (*Pan troglodytes*), whose status is EN – Endangered. According to Caldecott, and Miles (Caldecott & Miles, 2005) the range of the chimpanzees directly overlap the Project area. IUCN[21] has assigned irreplaceability values developing a large-scale ecological model on a large-scale landscape. Although the most sensitive point in Cabinda is the north-eastern side of the province (Mayombe - Dimonika transfrontier Protected area and National Park), irreplaceability values between the 25% and the 100 % of the possible maximum value are assigned within the Project AoI, determining an element of sensitivity (Figure 49).

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[21] The Regional Action Plan for the Conservation of Western Lowland Gorillas and Central Chimpanzees 2015–2025 (IUCN)
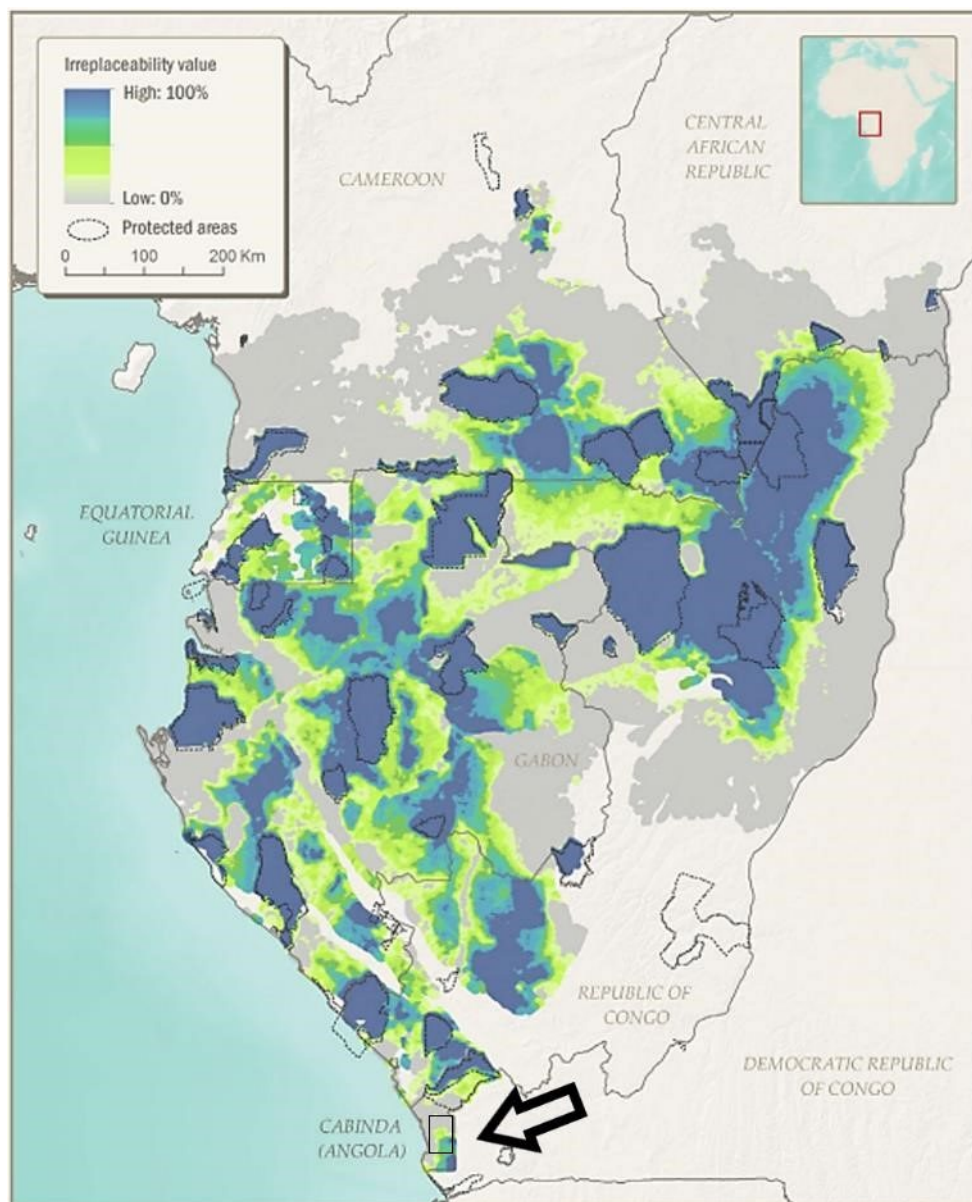
Figure 49: Apes Irreplaceability estimated values for great apes conservation in west Africa. The Project area is indicated by an arrow.

The only large carnivore that lives in Cabinda is the African leopard (*Panthera pardus*), which is very rare in the province, but known to occur south of the Chiloango River. African leopards are classified as a VU - Vulnerable species. It is a species protected by Angolan law, Executive Decree No. 37/99, of January 27, 1999 (*Diário da República No. 4, Series I*).

The African Manatee (*Trichechus senegalensis*) is a species classified by the IUCN as Vulnerable and, historically, has been recorded in the Chiloango River (Ambiente, 2018).

Based on literature review and according to the IUCN data, 88 mammal species (excluding the order Chiroptera) were identified as potentially present within a buffer of 50 km from the Project site (Table 13), with 17 species directly observed during the two field survey, and 3 from information gathered through interviews. The complete list of species observed and potentially present in the AoI is available in APPENDIX A (Table 21).

Table 4: Mammals species assessment with IUCN risk categories[22].

Class	LC and NT	CR, EN and VU	DD and NE
Mammalia	76	10	2
Total	*76*	*10*	*2*

According to the Global IUCN Red List, 10 species are identified as threatened, endangered and/or vulnerable. In addition, 12 species are identified as VU or EN-CR according to the National Red List (Ambiente, 2018). No restricted range and/or endemic species have been identified as potentially present within the AoI.

The species identified as of potential conservation concern due to their threatened status are listed in the following Table 14 with information on habitat preference, global and national conservation status. If the species was not observed in the field, an expert-based analysis of the likelihood of presence within the AoI of 5km have been investigated.

Table 5: Mammals species of conservation concern likelihood of occurrence in an AoI of 5 km

Species	Habitat	Global Status IUCN	National Red List	Observed Literature	Likelihood of presence in the AoI (5 km)
Acinonyx jubatus	Wide range of habitats and ecoregions, ranging from dry forest and thick scrub through to grassland and hyper arid deserts. Historically known to occur in the southern and eastern provinces of Angola.	VU	EN-CR	L	Not possible
Canis adustus	Side-striped Jackals occupy a range of habitats, from game areas through farmland to towns within the broad-leaved savanna zones, including wooded habitats, bush, grassland, abandoned cultivation, marshes, and montane habitats up to 2,700 m.	LC	VU	O	-
Caracal aurata	Primary moist equatorial forest, although on the periphery of its range it penetrates savanna regions along riverine forest. It also occurs in montane forest and alpine moorland in the east of its range.	VU	-	L	Possible

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[22] CR= critically endangered, EN= endangered, VU= vulnerable, NT= near threatened, LC= least concern, DD= data deficient, NE= not evaluated.

Species	Habitat	Global Status IUCN	National Red List	Observed Literature	Likelihood of presence in the AoI (5 km)
Cercopithecus neglectus	This mainly arboreal species is associated with riverine forest habitats. It is found close to rivers in lowland and submontane tropical moist forest, swamp forest, semi-deciduous forest and Acacia dominated forest.	LC	EN-CR	L	Possible
Civettictis civetta	African Civets occupy a wide variety of habitats including secondary forest, woodland, and bush habitats, as well as aquatic environments. They are apparently uncommon in mature interior forest habitats, but will infiltrate deep forest via logging roads, and in the forests of West and Central Africa, they thrive in degraded and deforested areas, and are regularly encountered near villages.	LC	VU	O	-
Diceros bicornis	Black Rhino occurs in a wide variety of habitats from desert areas to wetter wooded areas. The highest densities of rhinos are found in savannas on nutrient-rich soils.	CR	-	L	Not possible
Genetta tigrina	This species mostly occurs in well-watered zones in wooded or dense habitats such as fynbos, forests and bushclumps in the Western and Eastern Cape, and pine plantations and urban areas in Kwa-Zulu Natal. Sometimes it can be found in exotic scrub as well as open grasslands during foraging activities. Historically found in Cabinda.	LC	VU	L	Not possible
Gorilla gorilla	This species occurs in both swamp and terra firma lowland forests throughout Western Equatorial Africa. They are especially common where ground vegetation is dominated by monocotyledonous plants such as *Haumania liebrechtsiana* and	CR	EN-CR	L	Not possible

Species	Habitat	Global Status IUCN	National Red List	Observed Literature	Likelihood of presence in the AoI (5 km)
	Megaphrynium macrostachyum.				
Hydrictis maculicollis	The Spotted-necked Otter inhabits freshwater habitats where water is unsalted, unpolluted, and rich in small to medium sized fishes. Historically known to be present in Cabinda.	NT	VU	L	Possible
Leptailurus serval	The Serval has quite specific habitat requirements, so it may be locally restricted to smaller areas within its broad distribution range; it is not found in areas of rainforest or desert like habitats. It is found in well-watered savanna long-grass environments and are particularly associated with reedbeds and other riparian vegetation types. Historically know to be present in Cabinda.	LC	VU	L	Possible
Loxodonta cyclotis	The species occupy a variety of forest habitats including lowland humid forest on terra firma, swamp forests, the lower reaches of Afro-montane forests, dry forests and forest-savanna mosaics. They have a wide altitudinal range from the littoral forests along the Atlantic coast to about 2,000 metres in the Albertine Rift.	CR	VU	L	Possible
Mellivora capensis	This species lives in a wide variety of habitat types from the dense rain forests of equatorial Africa to the miombo and mopane woodland of Eastern Africa or the arid deserts on the outskirts of the Sahara and Namib. Historically found in Cabinda.	LC	VU	L	Possible

wsp

Species	Habitat	Global Status IUCN	National Red List	Observed Literature	Likelihood of presence in the AoI (5 km)
Orycteropus afer	Aardvarks occur in a broad range of habitats, including the semi-arid Karoo areas of southern Africa, grasslands, all savanna types, rainforests (but not swamp forests), woodlands and thickets. They are absent from hyper-arid habitats and avoid very rocky terrain that is difficult to dig in.	LC	VU	L	Possible
Pan troglodytes	Chimpanzees are found discontinuously across the forest belt of Africa, occupying primary and secondary moist lowland forest, swamp forest, submontane and montane forest, dry forest, forest galleries in savanna woodland, and farmland. In West Africa, Chimpanzees are also found in fallow-agricultural matrixes dominated by wild or feral oil palm.	EN	EN-CR	L	Possible
Panthera pardus	Leopards occur in the widest range of habitats among any of the Old-World Cats. The species thrives in the rainforests of West and Central Africa.	VU	VU	L	Possible
Phataginus tetradactyla	This species is the most arboreal of the African pangolin species. They are often found in riparian and swamp forests, typically in habitats dominated by palms (including rattans) and specialized swamp trees, such as *Uapaca spp*., *Pseudospondis spp*. and *Mitragina spp*., as well as in primary forests and forest-savannah mosaic.	VU	-	L	Possible
Phataginus tricuspis	This species occurs predominantly in moist tropical lowland forests and secondary growth, but also occurs in dense woodlands, especially along water courses.	EN	-	L	Possible

Species	Habitat	Global Status IUCN	National Red List	Observed Literature	Likelihood of presence in the AoI (5 km)
Smutsia gigantea	The Giant Pangolin occurs in primary and secondary rainforest forest formations, gallery forests, swamp forests, forest-savannah mosaic habitats and wooded savannah.	EN	VU	L	Possible
Syncerus caffer caffer	African Buffalo inhabit a wide range of habitats, including semi-arid bushland, Acacia woodland, miombo *Brachystegia* woodland, montane grasslands and forest (to elevations well over 4,000 m asl), coastal savannas, and moist lowland rainforests.	NT	EN-CR	L	Possible
Syncerus caffer nanus	*Syncerus caffer nanus* are found in rainforest regions with annual precipitation of at least 1500 mm. Specifically, they prefer rainforest clearings and open forest.	NE	EN-CR	L	Possible
Trichechus senegalensis	This species is an ocean and freshwater pelagic mammal.	VU	EN-CR	L	Possible

During the first field survey the only mammal species directly observed on the ground corresponds to the Malbrouck Monkey (*Chlorocebus cynosuros*), and footprints attributed to a Side-striped Jackal (*Canis adustus*) (Figure 50).

By surveying the rural population and hunters, it was confirmed that *Potamochoerus porcus*, *Tragelaphus spekii* and *Thryonomys swinderianus* are relatively abundant in the region, species considered locally as game.

Figure 50: *Chlorocebus cynosuros* and *Canis adustus* footprint, photographed in the field during the first field survey.

During the second field survey, the only mammal species directly observed was one adult *Tragelaphus scriptus* in the Survey Point MAM_07.

Figure 51: *Tragelaphus scriptus* **at MAM_07 during the second field survey.**

No Micromammals were captured in the trap lines (with baits). One of the traps (nº 03) was stolen by the population, which led to the field surveyors to place the traps in more isolated locations when the second trap lines were placed. During the periodical checking of the traps, it was verified that in many cases the bait had disappeared. It is important to note that the size of the traps does not allow the capture of micro-sized mammals, such as shrews and other species of similar size. It was therefore not possible to verify the *in-situ* occurrence of the micromammal community, with one exception being an accidental sight of *Mastomys natalensis*, during a nocturnal bird survey of the Survey Point BAB_09 (Figure 52).

However, the observation of several birds of prey and small carnivores specialized in rodent predation suggests the abundance of small micromammals in the region.

Figure 52: *Mastomys natalensis* **accidental sight during a nocturnal bird survey at BAB_09.**

Despite the not very significant evidence of micromammals species, the survey effort made by the surveyors in MAM and LMM Survey Points, the camera traps, as well as the visits to the bushmeat market located on the main road that connects Cabinda to Cacongo (close to the entrance to the New Airport) allows us to confirm the presence of a significant group of mammals.

From the 12 camera traps placed, 1 was stolen, and 4 did not make any detection. The remaining 7 camera traps recorded several mammals, birdS, reptiles, and human presence during the night (as shown in the Figure 53).

Figure 53: Human presence in CAM2 and CAM5.

The second field survey confirmed the presence of 6 carnivores including *Geneta maculata*, *Nandinia binotata* (Figure 54), *Civettictis civetta*, *Atilax paludinosus* (Figure 55), *Canis adustus* (Figure 56) and *Felis lybica* (Figure 57).

Figure 54: *Nandinia binotata* **captured in CAM9.**

Figure 55: *Atilax paludinosus* **in CAM9.**

Figure 56: *Canis adustus* **in CAM7.**

Figure 57: *Felis lybica* captured in CAM9.

Three species from the order Primates were detected, namely *Cercopithecus cephus*, *Chlorocebus cynosuros* and *Cercopithecus nictitans* subsp. *nictitans* (as shown in Figure 58 and Figure 59).

Figure 58: Probably *Cercopithecus nictitans* subsp*. nictitans* detected in CAM5.

Figure 59: Group of *Chlorocebus cynosuros* in CAM6.

Three species from the family Bovidae were recorded, namely *Tragelaphus scriptus*, *Tragelaphus spekii* and *Philantomba monticola*, as well as two large rodents (order Rodentia), namely *Thryonomys swinderianus* and *Atherurus africanus* (Figure 60).

Figure 60: *Atherurus africanus* in CAM9.

7.3.6.1   Bushmeat markets

The word bushmeat refers to the meat from wildlife species that are hunted for human consumption. In many countries, bushmeat represent a primary source of animal protein. There is not so much information on poaching

activities and illegal trade of terrestrial biodiversity in Angola. However, from bibliographic reviews, Cabinda reveals an extensive poaching pressure for subsistence and commercial use (Bersacola, et al., 2014; Oglethorpe, et al., 2018). The main species hunted are duikers, bushpig, porcupine, buffalo, wildcats, genets, civet, guenon, pangolin, cane-rat, game birds, green pigeon, snakes, and freshwater fish. The main hunting activities is with traps and snares, which is considered unselective for any mammals. Many of these species, including the two great apes, are also smuggled as pets or bushmeat across borders. Infant chimpanzees and gorillas, guenons, and especially African grey parrots, are captured for the commercial pet trade, involving cross-border illegal networks.

During the second field survey, informal visits were carried out in some bushmeat markets in Cabinda within a radius of less than 10 km from the Project's footprint. Below, a set of pictures of animals being sold by poachers is presented.

Geneta maculata
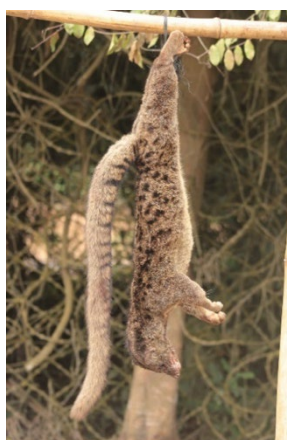
Nandinia binotata

Civettictis civetta
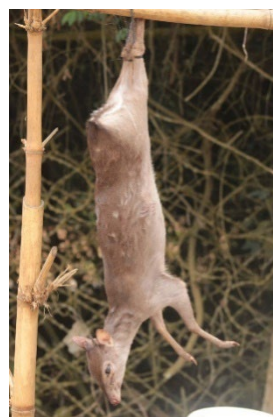
Philantomba monticola

Tragelaphus spekii

Cercopithecus cephus

Tragelaphus scriptus and *Thryonomys swinderianus*

Atherurus africanus

Thryonomys swinderianus and *Python sebae*

Philantomba monticola and *Thryonomys gregorianus*

7.4   Critical Habitat Assessment

The potential presence of Critical Habitats (CHs) within differentiated AoI was evaluated according to IFC Performance Standard 6 (Guidance Note 6, PS6, 2019).

According to IFC PS6, the designation of Critical Habitats is triggered by the criteria reported in the following chapter and assessed below.

A preliminary Critical Habitat determination was performed based on desktop studies and the first field survey. The results were then used to plan the second field survey with the aim of verifying also the presence of the species identified as potentially triggering Critical Habitats; those species are referred as *Target Species* (for further information see the paragraph 7.2.3).

Based on the two field surveys, the CH determination has been *revised and updated*.

7.4.1   Criterion I: Habitat of significant importance to Critically Endangered and/or Endangered species.

The Criterion I standards were applied on all fauna and flora species identified as present or potentially present within the AoI.

All the species having Endangered (EN) or Critically Endangered (CR) conservation status according to Global IUCN assessment was considered. In the absence of a Global IUCN assessment (*e.g.,* Not Evaluated NE, or Data Deficient DD) local assessments were considered (*e.g.,* Lista Vermelha de espécies de Angola, 2018-2023) (GN66 and GN70, (IFC, 2019)).

For assessing the biological and ecological importance of the Project's AoI for these species, the following thresholds were applied (GN72, (IFC, 2019)):

a)   areas that support globally important concentrations of an IUCN Red-listed EN or CR species (≥ 0.5% of the global population AND ≥5 reproductive units of a CR or EN species);

b)   areas that support globally important concentrations of an IUCN Red-listed VU species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN72(a);

c)   as appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species.

The **Criterion 1a** thresholds were applied on all fauna species having EN or CR conservation status according to Global IUCN Red List or local assessments.

Using a precautionary approach, all the species listed as Vulnerable (VU) according to IUCN Red List or local assessment and, potentially present in the AoI, were assessed. All these VU species have a wide distribution range; therefore, it was excluded that they could meet the thresholds for **Criterion 1b**: "Areas that support globally important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN72".

All species were also assessed for **Criterion 1c** "As appropriate areas containing nationally/regionally important concentrations of an IUCN Red-listed EN or CR species" was identified within or around the Area of Influence, taking in consideration all the species listed in "endangered and critically endangered species" according to the National Red List and nationally protected.

As a result, for the CH determination, 20 species were identified as potentially triggering Critical Habitat for criterion 1, as listed below:

■   6 bird species:

- Rufous-bellied heron (*Ardeola rufiventris*, LC and nationally EN-CR);

- Cape Gannet (*Morus capensis*, EN);

- Cape Cormorant (*Phalacrocorax capensis*, EN);

- Grey Parrot (*Psittacus erithacus*, EN and nationally EN-CR);

- Bateleur (*Terathopius ecaudatus*, EN);

- Atlantic Yellow-nosed Albatross (*Thalassarche chlororhynchos*, EN).

- <u>8 mammal species</u>:

  - De Brazza's Monkey (*Cercopithecus neglectus*, LC and nationally EN-CR);

  - Western Gorilla (*Gorilla gorilla ssp. gorilla*, CR and nationally EN-CR);

  - African Forest Elephant (*Loxodonta cyclotis*, CR);

  - Chimpanzee (*Pan troglodytes ssp. troglodytes,* EN and nationally EN-CR);

  - White-bellied Pangolin (*Phataginus tricuspis*, EN);

  - Giant Ground Pangolin (*Smutsia gigantea*, EN);

  - African Forest Buffalo (*Syncerus caffer nanus*, NE and nationally EN-CR);

  - African Manatee (*Trichechus senegalensis*, VU and nationally EN-CR).

- <u>8 plant species</u>:

  - Mukulungu (*Autranella congolensis*, EN);

  - *Eriocaulon stipantepalum* (EN);

  - *Genlisea angolensis* (EN);

  - Agba/Tola (*Gossweilerodendron balsamiferum*, EN);

  - Slender Waterlily (*Nymphoides tenuissima*, EN);

  - Limbila/Itoko (*Psilotrichum axilliflorum*, EN);

  - *Rotala robynsiana* (CR);

  - *Xyris exigua* (CR);

- <u>1 reptile species</u>:

  - Slender-snouted Crocodile *(Mecistops cataphractus,* CR).

Among the above-mentioned species only 1 was directly observed during the first field survey within the AoI, the Grey Parrot (*Psittacus erithacus*), at the point MAM13.

For applying the **Criterion 1a** thresholds, an "Ecologically Appropriate Area of Analysis" (EAAA)[23] has been identified for each taxon and used to determine the presence of CHs, since an exact numerical estimation of the local populations of the above-mentioned species does not exist (GN59, (IFC, 2019)).

The EAAA was then compared with the extent of occurrence (EOO) of each species, which represents the global population distribution: if the EAAA is ≥ 0.5% of the EOO, the area is defined as triggering potential Critical Habitat.

The **EOO** distribution ranges were downloaded from the IUCN global distribution maps for each species, and when IUCN data wasn't available, literature information was used to estimate quantitatively the EOO value. In some cases, for bird species, the EOO was derived from BirdLife[24].

The **EAAA** for each taxon has been identified as follows:

- for bird species: in absence of clear geographic boundaries and no proximity with Important Bird Areas (the closest "Maiombe" IBA is 70 km away), the EAAA for the bird species has been identified for both landscapes and seascapes. On land, most of the area is based on the hydrological sub-basins (from HydroSHEDS[25]) surrounding the AoI, and that extends south, following the patches of forests, herbaceous vegetation, and herbaceous wetlands (important habitats of those species and important connectivity element as ecological corridor). The defined EAAA includes also the proposed protected area of "Chiloango Mangroves" in the northern border of the area, and the "Mangrove National Park" in the southern part of the defined EAAA. On the sea, it was considered an area until the beginning of the continental escarpment, these is an important habitat used as food resources. Thus, the defined EAAA reaches an extension of 5538 km^2 (Figure 61).

- for mammal species: in absence of clear geographic boundaries, and no proximity with Key Biodiversity Areas (KBA), the EAAA has been identified based on the hydrological sub-basins (from HydroSHEDS[26]) surrounding the AoI, and extending south, following an apparent patch of forests, primary habitat of those species, and important connectivity element as ecological corridor. The defined EAAA includes also the proposed protected area of "Chiloango Mangroves" and reaches an extension of 2568 km^2 (Figure 62).

- for plant species: in absence of clear geographic boundaries, and no proximity with Important Plant Areas (IPA), the EAAA has been identified based on the four hydrological sub-basins surrounding the AoI, considering the dispersal ability of this taxon and including the proposed protected area of "Chiloango Mangroves", located 15 km north of the project footprint. The defined EAAA reaches an extension of 596 km^2 (Figure 63).

- for reptile species: in absence of clear geographic boundaries, and no proximity with Key Biodiversity Areas (KBA), the EAAA has been identified based on the main river channels, and associated sub-basins, connected down valley with the Project AoI, considered elements of linear connectivity and ecological corridors for the Slender-snouted Crocodile (*Mecistops cataphractus*). The EAAA also includes the

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[23] This area takes in account the distribution of species or ecosystems (within and sometimes extending beyond the project's area of influence) and the ecological patterns, processes, features, and functions that are necessary for maintaining them. These boundaries may include catchments, large rivers, or geological features. For some wide-ranging species, critical habitat may be informed by areas of aggregation, recruitment, or other specific habitat features of importance to the species. In all cases, the critical habitat should consider the distribution and connectivity of such features in the landscape/seascape and the ecological processes that support them.

[24] BirdLife International (2023) IUCN Red List for birds. Downloaded from http://datazone.birdlife.org on 03/07/2023.

[25] Lehner, B., Verdin, K., Jarvis, A. (2008): New global hydrography derived from spaceborne elevation data. Eos, Transactions, 89(10): 93-94. Data available at https://www.hydrosheds.org.

[26] Lehner, B., Verdin, K., Jarvis, A. (2008): New global hydrography derived from spaceborne elevation data. Eos, Transactions, 89(10): 93-94. Data available at https://www.hydrosheds.org.

proposed protected area of "Chiloango Mangroves", located 15 km north of the project footprint. The defined EAAA reaches an extension of 2056 km^2 (Figure 64).
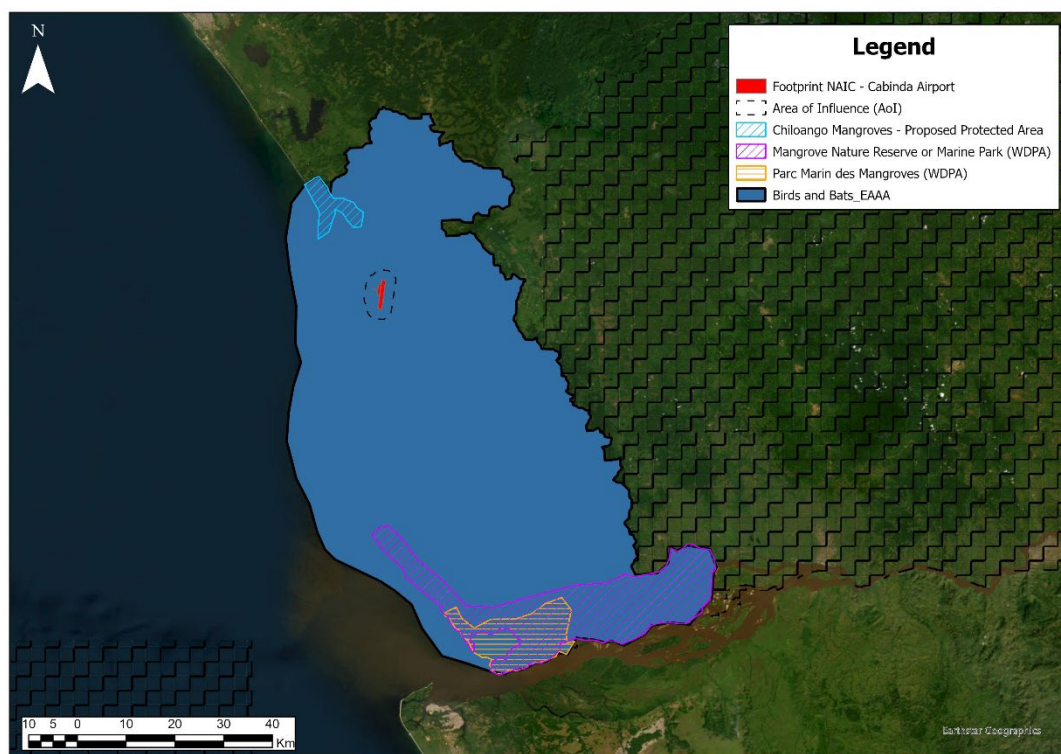
Figure 61: ecologically appropriate area of analysis (EAAA) for bird and bat species.
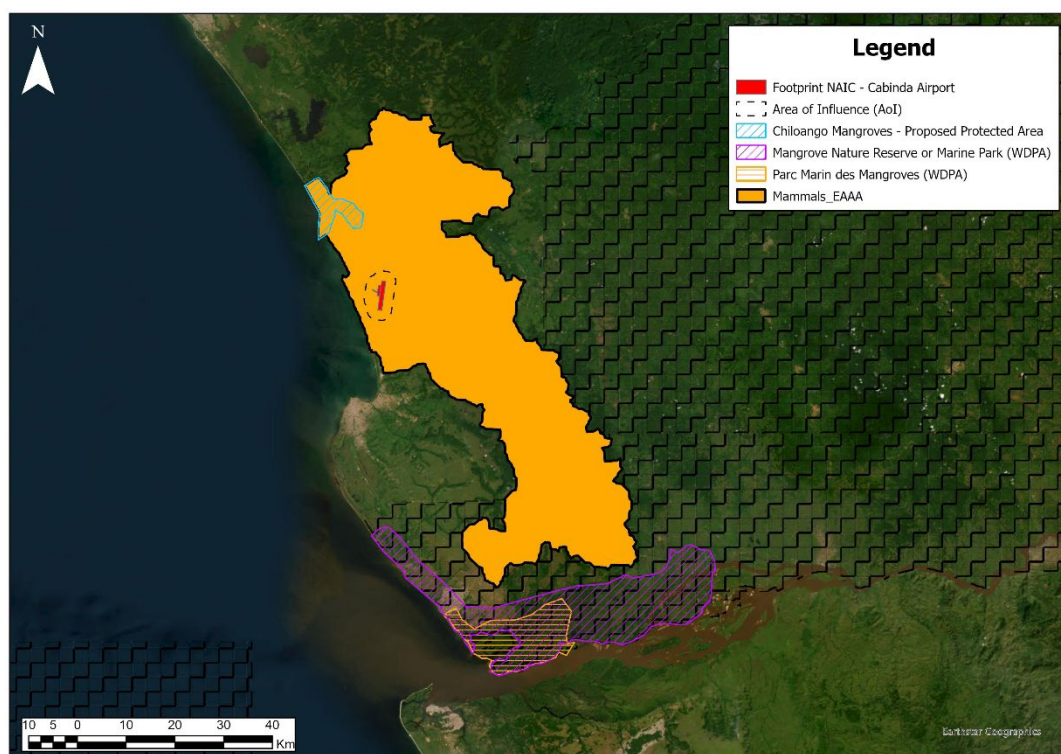
Figure 62: ecologically appropriate area of analysis (EAAA) for mammal species.
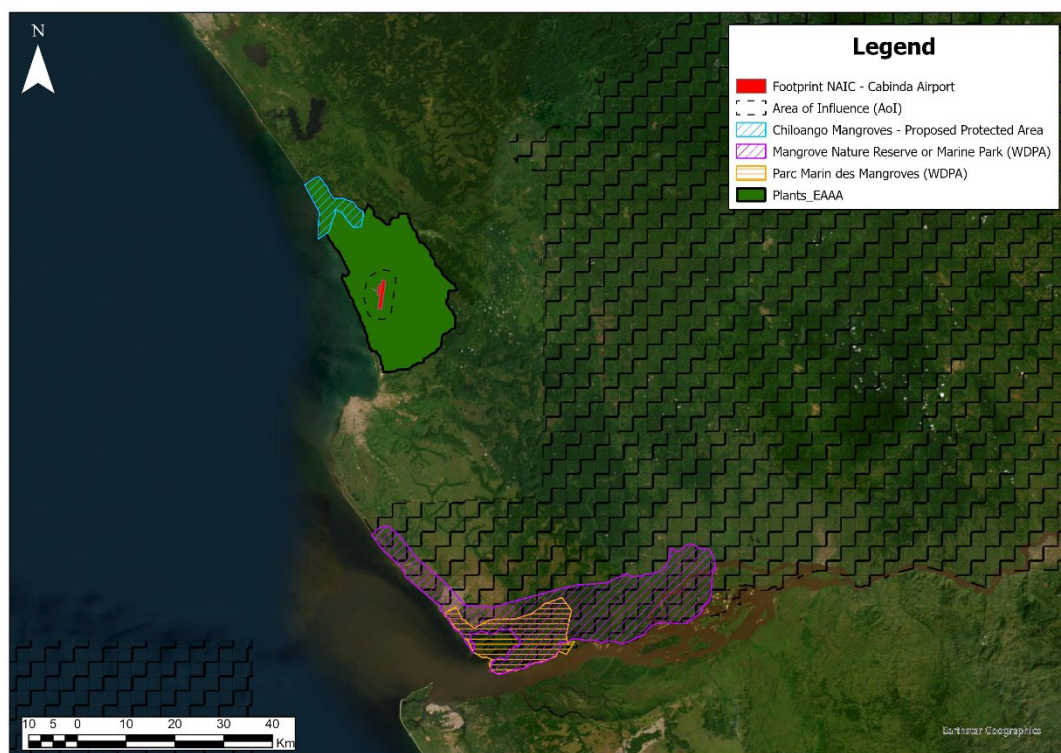
Figure 63: ecologically appropriate area of analysis (EAAA) for plant species.
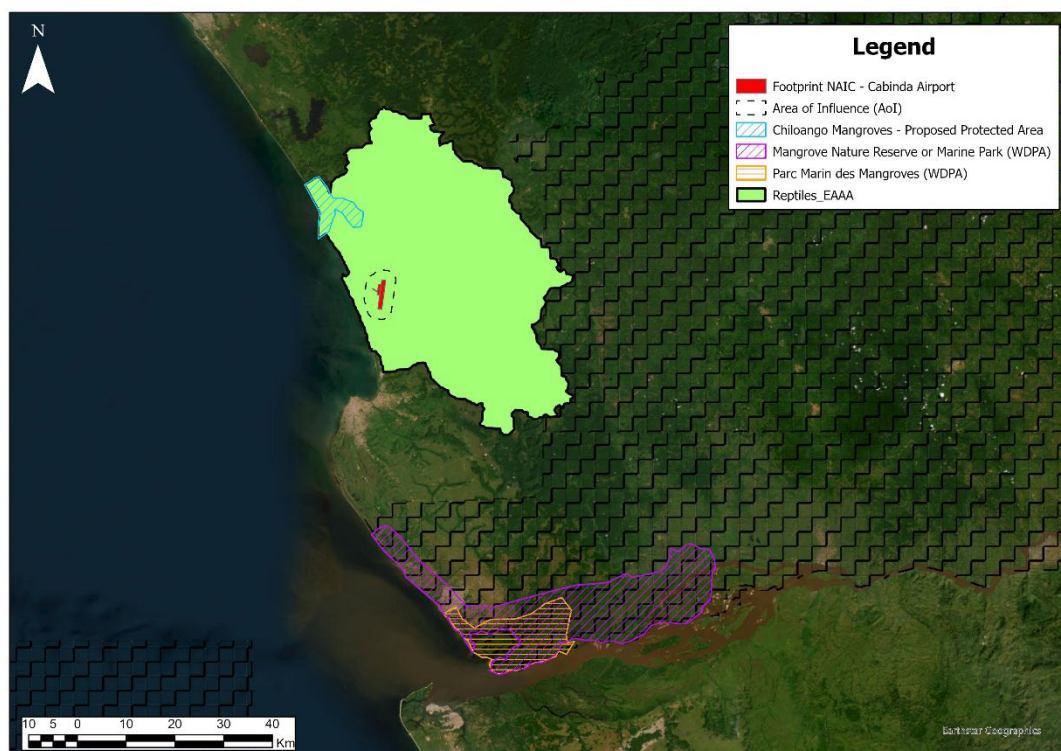
Figure 64: ecologically appropriate area of analysis (EAAA) for reptile species.

The results of the critical habitat assessment for Criterion 1 are detailed in Table 15. Species that could trigger critical habitats but that are considered only potentially present based on literature information and/or species for which insufficient data available are identified as triggering "Potential Critical Habitat". If the species has been confirmed in at least one occasion it is identified as "Critical Habitat".

As a result, 8 species were identified as triggering Critical Habitat or potential Critical Habitat according to Criterion 1.

Table 6: Screening of flora and fauna species triggering Critical Habitat according to Criterion 1 (IFC, 2019).

Taxon	Species name	Common name	Global IUCN Status	National Red List	End./ RR	EOO (Km²)	0.5% of EOO	EAAA (km²)	EAAA is ≥ 0.5% of EOO	Lit./Obs.	Critical Habitat
Bird	*Ardeola rufiventris*	Rufous-bellied heron	LC	EN-CR	.	8070000	40350	8589	No	Lit.	Potential CH (1c)
Birds	*Morus capensis*	Cape Gannet	EN	-	-	326000	1630	8589	Yes	Lit.	Potential CH (1a)
Birds	*Phalacrocorax capensis*	Cape Cormorant	EN	-	-	1060000	5300	8589	Yes	Lit.	Potential CH (1a)
Birds	*Psittacus erithacus*	Grey Parrot	EN	EN-CR	-	4460000	22300	8589	No	Obs.	CH (1c)
Birds	*Terathopius ecaudatus*	Bateleur	EN	-	-	23500000	117500	8589	No	Lit.	-
Birds	*Thalassarche chlororhynchos*	Atlantic Yellow-nosed Albatross	EN	-	-	29100000	145500	8589	No	Lit.	-
Mammals	*Gorilla gorilla*	Western Gorilla	CR	EN-CR	-	692848	3464	2568	No	Lit.	Potential CH (1c)
Mammals	*Loxodonta cyclotis*	African Forest Elephant	CR	VU	-	427996	2139	2568	Yes	Lit.	Potential CH (1a-1c)
Mammals	*Pan troglodytes*	Chimpanzee	EN	EN-CR	-	712024	3560	2568	No	Lit.	Potential CH (1c)
Mammals	*Phataginus tricuspis*	White-bellied Pangolin	EN	-	-	5952075	29760	2568	No	Lit.	-
Mammals	*Smutsia gigantea*	Giant Ground Pangolin	EN	VU	-	3468607	17343	2568	No	Lit.	-
Mammals	*Syncerus caffer nanus*	African Forest Buffalo	NE	EN-CR	-	4758404	23792	2568	No	Lit.	Potential CH (1c)

Taxon	Species name	Common name	Global IUCN Status	National Red List	End./ RR	EOO (Km^2)	0.5% of EOO	EAAA (km^2)	EAAA is ≥ 0.5% of EOO	Lit./Obs.	Critical Habitat
Plants	*Autranella congolensis*	Mukulungu	EN	VU	-	2419273	12096	596	No	Lit.	-
Plants	*Eriocaulon stipantepalum*	-	EN	-	-	380479	1902	596	No	Lit.	-
Plants	*Genlisea angolensis*	-	EN	-	-	2098611	10493	596	No	Lit.	-
Plants	*Gossweilerodendron balsamiferum*	Agba/Tola	EN	-	-	1478240	7391	596	No	Lit.	-
Plants	*Nymphoides tenuissima*	Slender Waterlily	EN	-	-	3083327	15416	596	No	Lit.	-
Plants	*Psilotrichum axilliflorum*	Limbila/Itoko	EN	-	-	2363160	11815	596	No	Lit.	-
Plants	*Rotala robynsiana*	-	CR	-	-	2974020	14870	596	No	Lit.	-
Plants	*Xyris exigua*	-	CR	-	-	2974020	14870	596	No	Lit.	-
Reptiles	*Mecistops cataphractus*	Slender-snouted Crocodile	CR	VU	-	4319744	21598	2056	No	Lit.	-

7.4.2   Criterion II: habitat of significant importance to endemic and/or restricted-range species

The presence of endemic or restricted-range species (EOO less than 50,000 km^2 for terrestrial vertebrates and plants; global range of less than or equal to 500 km linear geographic span for coastal, riverine, and other aquatic species that do not exceed 200 km width at any point) was considered (GN74, (IFC, 2019)).

As a result, 6 amphibian species were identified as potentially triggering CH based on Criterion 2. These species include:

■ Landana Reed Frog (*Hyperolius lucani,* NT, Range Restricted);

■ Cabinda Reed Frog (*Hyperolius maestus,* DD, Range Restricted);

■ Rochebrune's Reed Frog (*Hyperolius protchei*, DD, Range Restricted);

■ African Reed Frog (*Hyperolius rhizophilus,* DD, Range Restricted);

■ False Fraser's Clawed Frog (*Xenopus allofraseri,* LC, Range Restricted); and

■ Perret's Shovelnose Frog (*Hemisus perreti* LC, Range Restricted).

None of the above species was observed during the field surveys in the Project's AoI, therefore they are potentially present only based on literature review.

To assess the importance of the AoI for these species, the following threshold was applied (GN75, (IFC, 2019)):

a)   areas that regularly hold ≥10% of the global population size AND ≥ 10 reproductive units of a species.

Since an estimate on the number of reproductive units for the species is not available, an EAAA (Ecologically Appropriate Area of Analysis) has been identified for the abovementioned amphibian species, to apply the threshold identified in **Criterion 2a**.

In absence of clear geographic boundaries, and no proximity with Key Biodiversity Areas (KBA), the **EAAA** has been identified based on the four hydrological sub-basins (from HydroSHEDS) surrounding the AoI and including the proposed protected area of "Chiloango Mangroves", located 15 km north of the project footprint, considering the low vagility of this taxon. The thus defined EAAA reaches an extension of 596 km^2 (Figure 65).
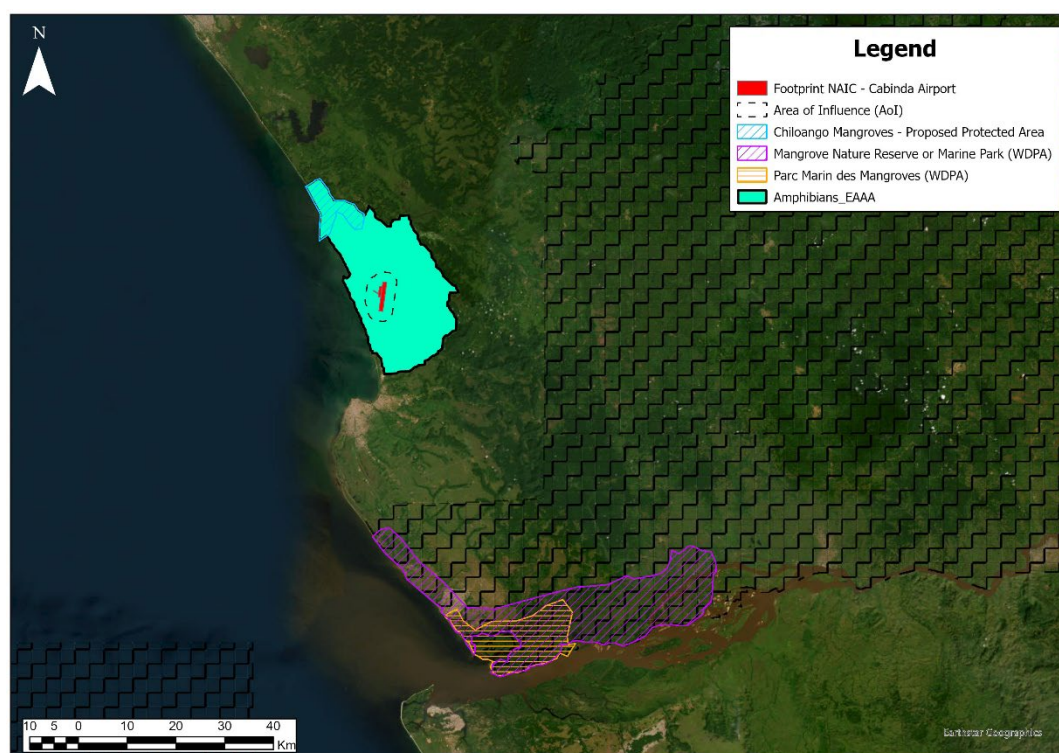
Figure 65: ecologically appropriate area of analysis (EAAA) for amphibian species.

The EAAA was then compared with the EOO of each species, which represents the global population distribution: if the EAAA is ≥ 10% of the EOO, the area is defined as triggering potential Critical Habitat (GN75, (IFC, 2019)).

The **EOO** distribution ranges were downloaded from the IUCN global distribution maps for each species, and when IUCN data wasn't available, literature information was used to estimate quantitatively the EOO value.

The results of the critical habitat assessment for Criterion 2 are summarized in Table 16. Species that could trigger critical habitats but that are considered only potentially present based on literature information and/or species for which not sufficient data are available are identified as triggering "Potential Critical Habitat".

As a result, 4 species were identified as potentially triggering Critical Habitat according to the Criterion 2, however it must be noted that these literature observations have been mentioned only by Rochebrune in 1885 in the Cabinda enclave, and it may be a synonym of other species (Marques, et al., 2018).

Table 7: Screening of species potentially triggering Critical Habitat according to Criterion 2 (IFC PS6, 2019)

Taxon	Species name	Common name	Obs./Lit.	Global IUCN Status	End./RR.	EOO (Km2)	10% of EOO (Km2)	EAAA (Km2)	EAAA is ≥ 10% of EOO	Critical Habitat
Amphibians	*Hyperolius lucani*	Landana Reed Frog	Lit.	DD	RR	32,231568	3,2231568	596	Yes	Potential CH
Amphibians	*Hyperolius maestus*	Cabinda Reed Frog	Lit.	DD	RR	32,231568	3,2231568	596	Yes	Potential CH
Amphibians	*Hyperolius protchei*	Rochebrune's Reed Frog	Lit.	DD	RR	32,231568	3,2231568	596	Yes	Potential CH
Amphibians	*Hyperolius rhizophilus*	African Reed Frog	Lit.	DD	RR	32,231568	3,2231568	596	Yes	Potential CH
Amphibians	*Xenopus allofraseri*	False Fraser's Clawed Frog	Lit.	LC	RR	11546,1381	1154,613812	596	No	-
Amphibians	*Hemisus perreti*	Perret's Shovelnose Frog	Lit.	LC	RR	50070,9021	5007,090215	596	No	-

7.4.3   Criterion III: habitat supporting globally significant concentrations of migratory and/or congregatory species.

The presence of Key Biodiversity Areas and Important Bird Areas identified for congregatory species and of Wetlands of International Importance designated under criteria 5 or 6 of the Ramsar Convention was considered. In addition, the presence of migratory and congregatory species was also considered.

The Project is not located within any protected or internationally recognized areas, moreover, the closest IBA ("Maiombe") is located at 70 km of distance, and the closest Ramsar Site ("Cayo-Loufoualeba") is located at 50 km of distance from the project footprint.

Using a precautionary approach, all the identified migratory and congregatory species were assessed according to Criterion 3. For birds, migratory and congregatory habits were derived from the IUCN Red List Assessment factsheets. For bats, such information wasn't available, if not for a subset of species, thus all bat species were conservatively screened according to this criterion.

In order to assess the importance of the AoI for these species, the following thresholds were applied (Guidance Note 6, GN78, IFC 2019):

a)   areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.

b)   areas that predictably support ≥ 10 percent of the global population of a species during periods of environmental stress.

Since a numerical estimation of the individual of the species does not exist, the same **EAAA** identified for Criterion 1 (more information are available in the paragraph 7.4.1) that reaches an extension of 5538 km^2, was used to determine the presence of CHs for bird and bats.

The EAAA is then compared with the extent of occurrence (EOO) of each species, which represents the global population estimate, in order to identify if that area could potentially meet Criterion 3 threshold: if the EAAA is ≥ 1% of the EOO, the area is defined as potentially triggering Critical Habitat (GN78, (IFC, 2019)).

The **EOO** distribution ranges were downloaded from the IUCN Global distribution maps for each species, and when IUCN data was not available, literature information was used to estimate quantitatively the EOO value. In some cases, for bird species, the EOO was derived from BirdLife[27] "Data zone".

The complete list of species assessed as Critical Habitat triggers for Criterion 3 is presented in following Table 17.

Species that could trigger critical habitats but that are considered only potentially present based on literature information and/or species for which not sufficient data are available are identified as triggering "Potential Critical Habitat".

<u>As a result, 1 bat species were identified as potentially triggering Critical Habitat according to the Criterion 3.</u>

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[27] BirdLife International (2023) IUCN Red List for birds. Downloaded from http://datazone.birdlife.org on 03/07/2023.

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Table 8: Screening of species potentially triggering Critical Habitat according to Criterion 3 (IFC PS6, 2019).

Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Bats	*Chaerephon chapini*	LC	M	-	4284817,237	42848	5538	No	Lit.	-
Bats	*Chaerephon pumilus*	LC	M	-	6940320,261	69403	5538	No	Lit.	-
Bats	*Eidolon helvum*	NT	M	-	11782921,01	117829	5538	No	Lit.	-
Bats	*Epomophorus labiatus*	LC	M	C	1765033,447	17650	5538	No	Lit.	-
Bats	*Epomophorus wahlbergi*	LC	M	C	4969445,934	49694	5538	No	Lit.	-
Bats	*Epomops franqueti*	LC	M	-	4508945,543	45089	5538	No	Lit.	-
Bats	*Glauconycteris argentata*	LC	M	-	3995886,311	39959	5538	No	Lit.	-
Bats	*Glauconycteris beatrix*	LC	M	-	1964506,752	19645	5538	No	Lit.	-
Bats	*Glauconycteris variegata*	LC	M	-	8693849,041	86938	5538	No	Lit.	-
Bats	*Hipposideros cyclops*	LC	M	-	2329831,752	23298	5538	No	Lit.	-
Bats	*Hypsignathus monstrosus*	LC	M	C	2860337,672	28603	5538	No	Lit.	-
Bats	*Lissonycteris angolensis*	LC	M	-	8785060,881	87851	5538	No	Lit.	-
Bats	*Megaloglossus woermanni*	LC	M	-	3120082,566	31201	5538	No	Lit.	-
Bats	*Micropteropus intermedius*	DD	M	-	203392,0553	2034	5538	Yes	Lit.	Potential CH
Bats	*Micropteropus pusillus*	LC	M	-	5380439,045	53804	5538	No	Lit.	-

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Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Bats	*Mimetillus moloneyi*	LC	M	C	3620866,864	36209	5538	No	Lit.	-
Bats	*Myonycteris torquata*	LC	M	-	3650609,035	36506	5538	No	Lit.	-
Bats	*Myotis bocagii*	LC	M	C	1819108,836	18191	5538	No	Lit.	-
Bats	*Neoromicia capensis*	LC	M	-	13742286,18	137423	5538	No	Lit.	-
Bats	*Neoromicia nana*	LC	M	-	10439061,62	104391	5538	No	Lit.	-
Bats	*Neoromicia tenuipinnis*	LC	M	-	4245023,462	42450	5538	No	Lit.	-
Bats	*Nycteris arge*	LC	M	-	3977254,357	39773	5538	No	Lit.	-
Bats	*Nycteris hispida*	LC	M	C	11501775,41	115018	5538	No	Lit.	-
Bats	*Nycteris macrotis*	LC	M	-	12087629,53	120876	5538	No	Lit.	-
Bats	*Nycteris nana*	LC	M	-	2937728,986	29377	5538	No	Lit.	-
Bats	*Nycteris thebaica*	LC	M	-	14389456,11	143895	5538	No	Lit.	-
Bats	*Pipistrellus crassulus*	LC	M	-	2600057,404	26001	5538	No	Lit.	-
Bats	*Pipistrellus rueppellii*	LC	M	-	2964378,492	29644	5538	No	Lit.	-
Bats	*Rhinolophus landeri*	LC	M	-	12118045,6	121180	5538	No	Lit.	-
Bats	*Rousettus aegyptiacus*	LC	M	C	2472843,42	24728	5538	No	Lit.	-
Bats	*Scotonycteris bergmansi*	LC	M	-	3796396,718	37964	5538	No	Lit.	-
Bats	*Scotophilus dinganii*	LC	M	C	10950331,9	109503	5538	No	Lit.	-
Bats	*Taphozous mauritianus*	LC	M	-	8338493,099	83385	5538	No	Lit.	-
Bats	*Triaenops afer*	LC	M	C	1632994,402	16330	5538	No	Lit.	-
Birds	*Accipiter badius*	LC	M	-	66800000	668000	5538	No	Lit.	-

wsp

Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Birds	*Acrocephalus arundinaceus*	LC	M	-	14090819,77	140908	5538	No	Obs.	-
Birds	*Acrocephalus schoenobaenus*	LC	M	-	17780855,72	177809	5538	No	Lit.	-
Birds	*Actitis hypoleucos*	LC	M	C	47200000	472000	5538	No	Obs.	-
Birds	*Actophilornis africanus*	LC	-	C	18822328,2	188223	5538	No	Lit.	-
Birds	*Agapornis pullarius*	LC	M	-	8360000	83600	5538	No	Lit.	-
Birds	*Anastomus lamelligerus*	LC	M	C	22800000	228000	5538	No	Obs.	-
Birds	*Anhinga rufa*	LC	-	C	20375522,04	203755	5538	No	Lit.	-
Birds	*Apaloderma narina*	LC	M	-	23300000	233000	5538	No	Lit.	-
Birds	*Apus affinis*	LC	M	-	55800000	558000	5538	No	Lit.	-
Birds	*Apus apus*	LC	M	-	10450375,15	104504	5538	No	Lit.	-
Birds	*Apus caffer*	LC	M	-	33500000	335000	5538	No	Lit.	-
Birds	*Apus melba*	LC	M	-	61100000	611000	5538	No	Obs.	-
Birds	*Ardea alba*	LC	M	C	21802066,44	218021	5538	No	Obs.	-
Birds	*Ardea cinerea*	LC	M	C	23935581,73	239356	5538	No	Obs.	-
Birds	*Ardea goliath*	LC	M	C	20090270,78	200903	5538	No	Lit.	-
Birds	*Ardea melanocephala*	LC	M	C	21174172,45	211742	5538	No	Lit.	-
Birds	*Ardea purpurea*	LC	M	C	21293776,97	212938	5538	No	Lit.	-
Birds	*Ardeola ralloides*	LC	M	C	21050539,6	210505	5538	No	Lit.	-
Birds	*Arenaria interpres*	LC	M	C	3530677,474	35307	5538	No	Lit.	-

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Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Birds	*Aviceda cuculoides*	LC	M	-	11679109,09	116791	5538	No	Lit.	-
Birds	*Bostrychia hagedash*	LC	-	C	18199437,24	181994	5538	No	Lit.	-
Birds	*Bostrychia rara*	LC	-	C	2953324,228	29533	5538	No	Lit.	-
Birds	*Bubulcus ibis*	LC	M	C	24285945,14	242859	5538	No	Obs.	-
Birds	*Buteo auguralis*	LC	M	-	11300000	113000	5538	No	Lit.	-
Birds	*Butorides striata*	LC	M	C	20929793,33	209298	5538	No	Lit.	-
Birds	*Calherodius leuconotus*	LC	M	C	8544390,486	85444	5538	No	Lit.	-
Birds	*Calidris alba*	LC	M	C	3384877,47	33849	5538	No	Obs.	-
Birds	*Calidris canutus*	NT	M	C	924156,3074	9242	5538	No	Lit.	-
Birds	*Calidris ferruginea*	NT	M	C	14422615,85	144226	5538	No	Lit.	-
Birds	*Calidris minuta*	LC	M	C	4750000	47500	5538	No	Lit.	-
Birds	*Calonectris borealis*	LC	M	-	97600000	976000	5538	No	Lit.	-
Birds	*Calonectris diomedea*	LC	M	-	74300000	743000	5538	No	Lit.	-
Birds	*Canirallus oculeus*	LC	-	C	1680644,564	16806	5538	No	Lit.	-
Birds	*Caprimulgus fossii*	LC	M	-	7430000	74300	5538	No	Lit.	-
Birds	*Cecropis abyssinica*	LC	M	-	12500033,45	125000	5538	No	Obs.	-
Birds	*Cecropis semirufa*	LC	M	-	4689981,322	46900	5538	No	Obs.	-
Birds	*Cecropis senegalensis*	LC	M	-	14219879,37	142199	5538	No	Obs.	-
Birds	*Charadrius forbesi*	LC	M	C	6578574,828	65786	5538	No	Lit.	-
Birds	*Charadrius hiaticula*	LC	M	C	40400000	404000	5538	No	Lit.	-

Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Birds	*Charadrius marginatus*	LC	-	C	4993465,518	49935	5538	No	Lit.	-
Birds	*Chlidonias leucopterus*	LC	M	C	27200000	272000	5538	No	Lit.	-
Birds	*Chlidonias niger*	LC	M	C	1198571,676	11986	5538	No	Lit.	-
Birds	*Chrysococcyx caprius*	LC	M	C	30000000	300000	5538	No	Lit.	-
Birds	*Chrysococcyx cupreus*	LC	M	-	9631144,97	96311	5538	No	Lit.	-
Birds	*Chrysococcyx klaas*	LC	M	-	9492402,685	94924	5538	No	Lit.	-
Birds	*Ciconia abdimii*	LC	M	-	8790000	87900	5538	No	Obs.	-
Birds	*Ciconia microscelis*	LC	-	C	15995404,56	159954	5538	No	Lit.	-
Birds	*Cinnyricinclus leucogaster*	LC	M	-	23900000	239000	5538	No	Lit.	-
Birds	*Clamator jacobinus*	LC	M	-	2753786,962	27538	5538	No	Lit.	-
Birds	*Clamator levaillantii*	LC	M	-	4522310,37	45223	5538	No	Lit.	-
Birds	*Crecopsis egregia*	LC	M	-	13000000	130000	5538	No	Obs.	-
Birds	*Crex egregia*	LC	M	C	6344569,178	63446	5538	No	Lit.	-
Birds	*Cuculus canorus*	LC	M	-	13201127,01	132011	5538	No	Lit.	-
Birds	*Cuculus clamosus*	LC	M	-	5629288,189	56293	5538	No	Lit.	-
Birds	*Cuculus solitarius*	LC	M	-	6357756,017	63578	5538	No	Lit.	-
Birds	*Delichon urbicum*	LC	M	-	17831506,95	178315	5538	No	Lit.	-
Birds	*Dendrocygna bicolor*	LC	M	-	148000000	1480000	5538	No	Lit.	-
Birds	*Dendrocygna viduata*	LC	M	C	21390665,2	213907	5538	No	Lit.	-
Birds	*Egretta garzetta*	LC	M	C	15549730,34	155497	5538	No	Obs.	-

Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Birds	*Eurillas virens*	LC	M	-	9830000	98300	5538	No	Lit.	-
Birds	*Eurystomus glaucurus*	LC	M	-	14703592,67	147036	5538	No	Lit.	-
Birds	*Falco naumanni*	LC	M	-	24800000	248000	5538	No	Lit.	-
Birds	*Falco peregrinus*	LC	M	-	413000000	4130000	5538	No	Lit.	-
Birds	*Falco tinnunculus*	LC	M	-	116000000	1160000	5538	No	Lit.	-
Birds	*Ficedula hypoleuca*	LC	M	-	17200000	172000	5538	No	Lit.	-
Birds	*Gallinago media*	NT	M	C	15418438,5	154184	5538	No	Lit.	-
Birds	*Glareola cinerea*	LC	-	C	3504861,185	35049	5538	No	Lit.	-
Birds	*Glareola nuchalis*	LC	M	-	17100000	171000	5538	No	Lit.	-
Birds	*Glareola pratincola*	LC	M	-	52700000	527000	5538	No	Lit.	-
Birds	*Halcyon leucocephala*	LC	M	-	14617084,08	146171	5538	No	Lit.	-
Birds	*Halcyon senegalensis*	LC	M	-	6223011,819	62230	5538	No	Obs.	-
Birds	*Hieraaetus ayresii*	LC	M	-	6897604,879	68976	5538	No	Lit.	-
Birds	*Himantopus himantopus*	LC	M	-	302000000	3020000	5538	No	Lit.	-
Birds	*Himantornis haematopus*	LC	-	C	2464910,992	24649	5538	No	Lit.	-
Birds	*Hippolais icterina*	LC	M	-	13200000	132000	5538	No	Lit.	-
Birds	*Hirundo angolensis*	LC	M	-	4940000	49400	5538	No	Lit.	-
Birds	*Hirundo rustica*	LC	M	C	15878206,09	158782	5538	No	Obs.	-
Birds	*Hirundo smithii*	LC	M	-	54600000	546000	5538	No	Lit.	-
Birds	*Hydroprogne caspia*	LC	M	C	3657697,072	36577	5538	No	Lit.	-

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Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Birds	*Ispidina picta*	LC	M	-	11108969,19	111090	5538	No	Lit.	-
Birds	*Ixobrychus minutus*	LC	M	C	18254295,33	182543	5538	No	Lit.	-
Birds	*Ixobrychus sturmii*	LC	M	C	14081617,32	140816	5538	No	Lit.	-
Birds	*Lamprotornis splendidus*	LC	M	-	11500000	115000	5538	No	Lit.	-
Birds	*Lanius collurio*	LC	M	-	18900000	189000	5538	No	Lit.	-
Birds	*Larus cirrocephalus*	LC	M	C	25324411,39	253244	5538	No	Lit.	-
Birds	*Limosa lapponica*	NT	M	C	2753107,94	27531	5538	No	Lit.	-
Birds	*Megabyas flammulatus*	LC	M	-	7860000	78600	5538	No	Lit.	-
Birds	*Merops albicollis*	LC	M	-	3738210,621	37382	5538	No	Lit.	-
Birds	*Merops malimbicus*	LC	M	-	2610000	26100	5538	No	Lit.	-
Birds	*Merops persicus*	LC	M	-	30800000	308000	5538	No	Lit.	-
Birds	*Microcarbo africanus*	LC	-	C	19794335,17	197943	5538	No	Obs.	-
Birds	*Milvus aegyptius*	LC	M	-	116000000	1160000	5538	No	Lit.	-
Birds	*Milvus migrans*	LC	M	C	23925414,81	239254	5538	No	Lit.	-
Birds	*Morus capensis*	LC	-	C	1211409,543	12114	5538	No	Lit.	-
Birds	*Motacilla flava*	LC	M	C	19632294,76	196323	5538	No	Lit.	-
Birds	*Muscicapa striata*	LC	M	-	32400000	324000	5538	No	Lit.	-
Birds	*Mycteria ibis*	LC	M	C	17298205,57	172982	5538	No	Lit.	-
Birds	*Neophedina cincta*	LC	M	-	3795759,871	37958	5538	No	Lit.	-
Birds	*Nettapus auritus*	LC	-	C	20090640,36	200906	5538	No	Lit.	-

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Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Birds	Numenius arquata	NT	M	C	9038559,657	90386	5538	No	Lit.	-
Birds	Numenius phaeopus	LC	M	C	4085154,842	40852	5538	No	Lit.	-
Birds	Nycticorax nycticorax	LC	M	C	16963919,32	169639	5538	No	Lit.	-
Birds	Oceanites oceanicus	LC	M	C	81829147,57	818291	5538	No	Lit.	-
Birds	Oena capensis	LC	M	-	38800000	388000	5538	No	Lit.	-
Birds	Onychoprion fuscatus	LC	M	-	195000000	1950000	5538	No	Lit.	-
Birds	Pandion haliaetus	LC	M	C	24085091,87	240851	5538	No	Obs.	-
Birds	Pelecanus onocrotalus	LC	M	-	51200000	512000	5538	No	Lit.	-
Birds	Pernis apivorus	LC	M	C	15628716,94	156287	5538	No	Lit.	-
Birds	Petrochelidon rufigula	LC	M	-	1920000	19200	5538	No	Lit.	-
Birds	Phalacrocorax capensis	EN	-	C	1060000	10600	5538	No	Lit.	-
Birds	Phoenicopterus roseus	LC	M	-	58100000	581000	5538	No	Lit.	-
Birds	Phylloscopus trochilus	LC	M	-	14476534,78	144765	5538	No	Lit.	-
Birds	Pitta angolensis	LC	M	-	645146,4501	6451	5538	No	Lit.	-
Birds	Plectropterus gambensis	LC	M	C	17228954,35	172290	5538	No	Lit.	-
Birds	Plegadis falcinellus	LC	M	-	180000000	1800000	5538	No	Lit.	-
Birds	Pluvialis squatarola	LC	M	C	3527843,519	35278	5538	No	Lit.	-
Birds	Podica senegalensis	LC	-	C	12379351,88	123794	5538	No	Lit.	-
Birds	Porphyrio alleni	LC	M	C	18342454,47	183425	5538	No	Lit.	-
Birds	Psalidoprocne pristoptera	LC	M	-	9365133,004	93651	5538	No	Lit.	-

Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Birds	*Pseudochelidon eurystomina*	DD	M	-	694000	6940	5538	No	Lit.	-
Birds	*Pteronetta hartlaubii*	LC	-	C	4502932,854	45029	5538	No	Lit.	-
Birds	*Rynchops flavirostris*	LC	M	C	10803075,11	108031	5538	No	Lit.	-
Birds	*Sarkidiornis melanotos*	LC	M	-	53300000	533000	5538	No	Lit.	-
Birds	*Scopus umbretta*	LC	-	C	22565946,2	225659	5538	No	Lit.	-
Birds	*Stercorarius parasiticus*	LC	M	-	148000000	1480000	5538	No	Lit.	-
Birds	*Sterna hirundo*	LC	M	C	2345331,015	23453	5538	No	Lit.	-
Birds	*Sternula albifrons*	LC	M	C	1160472,782	11605	5538	No	Lit.	-
Birds	*Sternula balaenarum*	LC	M	-	1350000	13500	5538	No	Lit.	-
Birds	*Streptopelia capicola*	LC	M	-	15100000	151000	5538	No	Obs.	-
Birds	*Streptopelia semitorquata*	LC	M	-	15362690,96	153627	5538	No	Obs.	-
Birds	*Sylvia borin*	LC	M	-	17900000	179000	5538	No	Lit.	-
Birds	*Tachybaptus ruficollis*	LC	M	C	22790714,96	227907	5538	No	Obs.	-
Birds	*Terpsiphone viridis*	LC	M	-	26800000	268000	5538	No	Lit.	-
Birds	*Thalassarche chlororhynchos*	EN	M	C	29100000	291000	5538	No	Lit.	-
Birds	*Thalasseus maximus*	LC	M	-	73800000	738000	5538	No	Lit.	-
Birds	*Thalasseus sandvicensis*	LC	M	-	98800000	988000	5538	No	Lit.	-
Birds	*Threskiornis aethiopicus*	LC	M	C	19936683,02	199367	5538	No	Obs.	-

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Taxon	Species name	IUCN Global Status	Migr. (M)	Congr. (C)	EOO (Km2)	1% of EOO (km2)	EAAA	EAAA (Km2) ≥ 1% EOO	Obs./Lit.	Critical Habitat
Birds	*Tringa glareola*	LC	M	C	22996586,73	229966	5538	No	Lit.	-
Birds	*Tringa nebularia*	LC	M	C	24029109,49	240291	5538	No	Lit.	-
Birds	*Tringa ochropus*	LC	M	C	22616325,5	226163	5538	No	Lit.	-
Birds	*Tringa stagnatilis*	LC	M	C	21432759,38	214328	5538	No	Obs.	-
Birds	*Tringa totanus*	LC	M	C	14796262,87	147963	5538	No	Lit.	-
Birds	*Turnix nanus*	LC	M	-	3834233,836	38342	5538	No	Lit.	-
Birds	*Turtur afer*	LC	M	-	10132676,68	101327	5538	No	Obs.	-
Birds	*Turtur tympanistria*	LC	M	-	9065862,049	90659	5538	No	Lit.	-
Birds	*Upupa epops*	LC	M	-	6318767,578	63188	5538	No	Obs.	-
Birds	*Vanellus albiceps*	LC	-	C	7960132,409	79601	5538	No	Lit.	-
Birds	*Vanellus lugubris*	LC	M	-	12900000	129000	5538	No	Obs.	-
Birds	*Xema sabini*	LC	M	-	9270000	92700	5538	No	Lit.	-
Birds	*Zapornia flavirostra*	LC	-	C	18312344,33	183123	5538	No	Lit.	-

7.4.4   Criterion IV: highly threatened and/or unique ecosystems

Ecosystems that are at risk of significantly decreasing in area or quality, have a small spatial extent, and/or contain concentrations of biome-restricted species were considered for this criterion.

The Criterion 4 application (GN79, (IFC, 2019)) foresees the use of the "Red List of Ecosystems (RLE)" where formal IUCN assessments have been conducted. However, as shown in the IUCN RLE Database[28], only a subset of ecosystems has been assessed in Angola and Cabinda, and the relevant information hasn't been added to the database yet. Therefore, this system cannot be used at present.

In absence of a National Red List of habitats, an expert-based assessment was performed on the habitat categories identified through desktop and field studies. A habitat map was created using land cover data from Global Land Cover 2000 database produced by an international partnership of about 30 research groups coordinated by the European Commission's Joint Research Centre (JRC) in compliance with the standard FAO and UNEP, and available on the FAO GeoNetwork website.

None of the GLC2000 habitats identified within the AoI is considered unique ecosystem and/or highly threatened. Therefore, no Critical habitat is expected to be present in the AoI according to criterion 4 (GN80, IFC GN6 2019).

The assessment led to the conclusion that no Critical Habitat is expected to be present in the Area of Influence according to this criterion.

7.4.5   Criterion V: areas associated with key evolutionary processes.

This criterion includes presence of areas with landscape features that might be associated with evolutionary processes or species populations that are especially distinct and may be of special conservation concern given their distinct evolutionary history was considered.

The study area is not known to contain landscape features that may influence evolutionary processes, giving rise to regional configurations of species and ecological properties. In fact, no species and/or subpopulations of species is characterized by a particular level of isolation, spatial heterogeneity, and wealth of environmental gradients or edaphic interfaces. These considerations suggest that the study area does not support any key evolutionary process.

Therefore, no Critical Habitat is expected to be present in the AoI according to this criterion.

7.4.6   Results of Critical Habitat Assessment

As results of this assessment, species that could trigger CH but that are considered only potentially present based on literature information and/or species for which insufficient data are available, are identified as triggering "Potential Critical Habitat". Where the presence has been confirmed in at least one occasion it is identified as "Critical Habitat".

To summarize, the Critical Habitat assessment gave the following results:

- 8 species are triggering CH according to the Criterion 1, which 4 are bird and 4 mammals' species.

- 4 species are triggering CH according to the Criterion 2, represented by amphibians' species.

- 1 species is triggering CH according to the Criterion 3, represented by a bat species.

One of the four bird species, the Grey Parrot, has been directly observed during the first field survey (Survey Point MAM_13) located northeast from the Project's footprint (at about 3 km). Even if the Survey Point falls

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[28] http://assessments.iucnrle.org/

outside the 2 km, we cannot exclude the potential presence of this species, since there are suitable habitats and the same environmental conditions within the AoI. The other 3 bird species (the Rufous-bellied heron, the Cape Gannet, and the Cape Cormorant) have not been observed during the two-field surveys, however, due to their ethology and the ecology of the AoI, the potential presence of these species cannot be totally excluded. *For these reasons the four bird species are considered potentially triggering CH.*

The four mammal's species (the western gorilla, the African forest elephant, the chimpanzee, and the African forest buffalo) have not been observed during the two-field surveys, and due the use of adjacent habitats, to the habitat fragmentation and the environment condition present within the AoI, are not likely considered present within the AoI. However, during the two field surveys, information from local hunters and farmers where gathered, and several times it was reported the presence of the African forest elephant and chimpanzee was mentioned as present in the past in few points (Survey Point MAM_2, MAM_07, MAM_08). *For these reasons, the western gorilla and the African forest buffalo are not considered present within the AoI and therefore they don't trigger potential CH. On the other side, also if a third parties' information cannot be considered a direct observation, the African forest elephant and the chimpanzees are considered potentially triggering CH.*

The four amphibian's species have not been observed during the two-field surveys, and moreover it must be noted that these literature observations have been mentioned only by Rochebrune in 1885 in the Cabinda enclave, and it may be a synonym of other species (Marques, et al., 2018). *For this reason, these amphibians' species are not considered present within the AoI and therefore they don't trigger potential CH.*

Last, the bat species (the Hayman's dwarf epauletted fruit bat) has not been observed during the two-field surveys, however due to its ethology and ecology of the AoI, the potential presence of this species cannot be totally excluded. *For this reason, the bat species is considered potentially triggering CH.*

As reported in section 7.3.2, Natural and Modified Habitats were defined within the AoI. Among them, all identified Natural Habitats and 1 Modified Habitat ("mosaic of croplands and forest") are suitable to support populations of CH-qualifying species, therefore the polygons within a distance of 500 m from the survey point where a CH species was observed are considered "Confirmed Critical Habitat", while polygons where no CH species were observed are identified as "Potential Critical Habitat"; all other polygons are defined "non-Critical Habitats". The distribution of Critical Habitats is shown in the Figure 66.

Figure 66: Map of the Critical Habitats and non-Critical Habitats within the Area of Influence of 2 km.

7.5   Bibliography

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APPENDIX A

Complete list of species observed
and potentially present.

Table 9: Flora species list.

Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Acanthaceae	*Acanthus montanus*	L	LC	
Plantae	Pteridaceae	*Acrostichum aureum*	L	LC	
Plantae	Pteridaceae	*Acrostichum danaeifolium*	L	LC	
Plantae	Passifloraceae	*Adenia lobata*	O	NE	
Plantae	Asteraceae	*Adenostemma caffrum*	L	LC	
Plantae	Asteraceae	*Aedesia glabra*	L	LC	
Plantae	Connaraceae	*Agelaea pentagyna*	O	LC	
Plantae	Fabaceae	*Albizia adianthifolia*	O	LC	
Plantae	Fabaceae	*Albizia glaberrima*	L	LC	VU
Plantae	Fabaceae	*Albizia gummifera*	O	LC	
Plantae	Euphorbiaceae	*Alchornia cordifolia*	O	NE	
Plantae	Alismataceae	*Alisma plantago-aquatica*	L	LC	
Plantae	Clusiaceae	*Allanblackia floribunda*	O	LC	
Plantae	Amaranthaceae	*Alternanthera sessilis*	L	LC	
Plantae	Alismataceae	*Anchomanes difformis*	O	LC	
Plantae	Orchidaceae	*Angraecum bancoense*	L	LC	
Plantae	Anisophyllaceae	*Anisophyllea quangensis*	O	NE	
Plantae	Acanthaceae	*Anisotes macrophyllus*	L	LC	

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Annonaceae	*Annona senegalensis*	O	LC	
Plantae	Gentianaceae	*Anthocleista schweinfurthii*	O	LC	
Plantae	Araceae	*Anubias gilletii*	L	LC	
Plantae	Araceae	*Anubias hastifolia*	L	LC	
Plantae	Araceae	*Anubias heterophylla*	L	LC	
Plantae	Aponogetonaceae	*Aponogeton stuhlmannii*	L	LC	
Plantae	Aponogetonaceae	*Aponogeton vallisnerioides*	L	LC	
Plantae	Cyperaceae	*Ascolepis capensis*	L	LC	
Plantae	Asteraceae	*Aspilia helianthoides*	L	LC	
Plantae	Asteraceae	*Aspilia kotshy*	O	NE	
Plantae	Sapotaceae	*Autranella congolensis*	L	EN	VU
Plantae	Acanthaceae	*Avicennia germinans*	L	LC	
Plantae	Salviniaceae	*Azolla nilotica*	L	LC	
Plantae	Poaceae	*Bambusa vulgaris*	O	NE	
Plantae	Fabaceae	*Bobgunnia fistuloides*	L	LC	VU
Plantae	Malvaceae	*Bombax reflexum*	L	LC	
Plantae	Fabaceae	*Brachystegia spiciformis*	L	LC	VU
Plantae	Phyllanthaceae	*Bridelia micrantha*	O	LC	
Plantae	Acanthaceae	*Brillantaisia lamium*	L	LC	

Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Acanthaceae	*Brillantaisia owariensis*	O	LC	
Plantae	Acanthaceae	*Brillantaisia soyauxii*	L	LC	
Plantae	Cyperaceae	*Bulbostylis trabeculata*	L	DD	
Plantae	Fabaceae	*Caesalpinia leostachya*	L	NE	VU
Plantae	Fabaceae	*Calopogonium mucunoides*	O	NE	
Plantae	Burseraceae	*Canarium schweinfurthii*	L	LC	
Plantae	Asteraceae	*Carduus nyassanus*	L	LC	
Plantae	Polygalaceae	*Carpolobia alba*	O	LC	
Plantae	Malvaceae	*Ceiba pentandra*	O	LC	VU
Plantae	Amaranthaceae	*Centrostachys aquatica*	L	LC	
Plantae	Amaranthaceae	*Centrostachys aquatica*	L	LC	
Plantae	Araceae	*Cercestis congensis*	L	LC	
Plantae	Asteraceae	*Chromolaena odorata*	O	NE	
Plantae	Vitaceae	*Cissus aralioides*	O	NE	
Plantae	Cyperaceae	*Cladium mariscus*	L	LC	
Plantae	Connaraceae	*Cnestis corniculate*	O	NE	
Plantae	Connaraceae	*Cnestis ferruginea*	O	NE	
Plantae	Cucurbitaceae	*Cogniauxia podoleana*	O	DD	
Plantae	Malvaceae	*Cola diversifolia*	O	NE	

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Malvaceae	*Cola lateritia*	O	DD	
Plantae	Combretaceae	*Combretum racemosum*	O	NE	
Plantae	Combretaceae	*Conocarpus erectus*	L	LC	
Plantae	Asteraceae	*Conyza clarenceana*	L	LC	
Plantae	Rubiaceae	*Corynanthe macroceras*	L	LC	VU
Plantae	Olacaceae	*Coula edulis*	L	LC	
Plantae	Asteraceae	*Crassocephalum picridifolium*	L	LC	
Plantae	Acanthaceae	*Crossandrella dusenii*	L	LC	
Plantae	Apocynaceae	*Cryptolepis oblongifolia*	O	NE	
Plantae	Poaceae	*Ctenium concinum*	O	NE	
Plantae	Araceae	*Culcasia dinklagei*	L	LC	
Plantae	Araceae	*Culcasia sapinii*	L	LC	
Plantae	Araceae	*Culcasia scandens*	L	LC	
Plantae	Araceae	*Culcasia striolata*	L	LC	
Plantae	Araceae	*Culcasia tenuifolia*	L	LC	
Plantae	Cyperaceae	*Cyperus alopecuroides*	L	LC	
Plantae	Cyperaceae	*Cyperus amabilis*	L	LC	
Plantae	Cyperaceae	*Cyperus articulatus*	L	LC	
Plantae	Cyperaceae	*Cyperus compressus*	L	LC	

Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Cyperaceae	*Cyperus glaucophyllus*	L	LC	
Plantae	Cyperaceae	*Cyperus hortensis*	L	LC	
Plantae	Cyperaceae	*Cyperus maculatus*	L	LC	
Plantae	Cyperaceae	*Cyperus michelianus*	L	LC	
Plantae	Cyperaceae	*Cyperus papyrus*	L	LC	
Plantae	Cyperaceae	*Cyperus pustulatus*	L	LC	
Plantae	Cyperaceae	*Cyperus reduncus*	L	LC	
Plantae	Cyperaceae	*Cyperus rotundus*	L	LC	
Plantae	Cyperaceae	*Cyperus schimperianus*	L	LC	
Plantae	Fabaceae	*Dalbergia latifolia*	L	VU	VU
Plantae	Fabaceae	*Dalhousiea africana*	O	NE	
Plantae	Fabaceae	*Dialium pachyphyllum*	O	LC	
Plantae	Dichapetalaceae	*Dichapetalum lujae*	O	NE	
Plantae	Acanthaceae	*Dicliptera elliotii*	L	LC	
Plantae	Dioscoreaceae	*Dioscorea alatata*	O	NE	
Plantae	Dioscoreaceae	*Dioscorea bulbifera*	O	NE	
Plantae	Dioscoreaceae	*Dioscorea praehensilis*	O	LC	
Plantae	Dioscoreaceae	*Dioscorea smilacifolia*	O	LC	
Plantae	Ebanaceae	*Diospyros mespiliformis*	L	LC	VU

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Acanthaceae	*Dischistocalyx hirsutus*	L	LC	
Plantae	Asparagaceae	*Dracena mannii*	O	LC	
Plantae	Asteraceae	*Eclipta prostrata*	L	LC	
Plantae	Aracaceae	*Elaeis guineensis*	O	LC	
Plantae	Cyperaceae	*Eleocharis acutangula*	L	LC	
Plantae	Cyperaceae	*Eleocharis atropurpurea*	L	LC	
Plantae	Cyperaceae	*Eleocharis geniculata*	L	LC	
Plantae	Cyperaceae	*Eleocharis retroflexa*	L	LC	
Plantae	Cyperaceae	*Eleocharis variegata*	L	LC	
Plantae	Fabaceae	*Entada mannii*	O	NE	
Plantae	Meliaceae	*Entandrophragma utile*	L	LC	VU
Plantae	Asteraceae	*Enydra fluctuans*	L	LC	
Plantae	Asteraceae	*Enydra fluctuans*	L	LC	
Plantae	Eriocaulaceae	*Eriocaulon albocapitatum*	L	LC	
Plantae	Eriocaulaceae	*Eriocaulon setaceum*	L	LC	
Plantae	Eriocaulaceae	*Eriocaulon stipantepalum*	L	EN	
Plantae	Moraceae	*Ficus exasperata*	O	LC	
Plantae	Moraceae	*Ficus thonningii*	O	LC	
Plantae	Cyperaceae	*Fimbristylis aphylla*	L	LC	

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Cyperaceae	*Fimbristylis aphylla*	L	LC	
Plantae	Cyperaceae	*Fimbristylis complanata*	L	LC	
Plantae	Cyperaceae	*Fimbristylis dichotoma*	L	LC	
Plantae	Cyperaceae	*Fimbristylis ferruginea*	L	LC	
Plantae	Flagellariaceae	*Flagellaria guineensis*	O	NE	
Plantae	Apocynaceae	*Funtumia africana*	O	LC	
Plantae	Sapotaceae	*Gambeya africana*	L	LC	VU
Plantae	Lentibulariaceae	*Genlisea angolensis*	L	EN	
Plantae	Fabaceae	*Gilbertiodendron dewevrei*	O	LC	
Plantae	Gnetaceae	*Gnetum africanum*	L	NT	VU
Plantae	Fabaceae	*Gossweilerodendron balsamiferum*	L	EN	
Plantae	Asteraceae	*Grangea maderaspatana*	L	LC	
Plantae	Asteraceae	*Grangea maderaspatana*	L	LC	
Plantae	Fabaceae	*Guibourtia arnoldiana*	L	LC	
Plantae	Cymodoceaceae	*Halodule wrightii*	L	LC	
Plantae	Hypericaceae	*Harungana madagascariensis*	O	LC	
Plantae	Rubiaceae	*Heinsia crinita*	O	LC	
Plantae	Asteraceae	*Helichrysum formosissimum*	L	LC	
Plantae	Pontederiaceae	*Heteranthera callifolia*	L	LC	

Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Huaceae	*Hua gabonii*	O	LC	
Plantae	Hydrocharitaceae	*Hydrilla verticillata*	L	LC	
Plantae	Hydrocharitaceae	*Hydrocharis chevalieri*	L	LC	
Plantae	Acanthaceae	*Hygrophila senegalensis*	L	LC	
Plantae	Acanthaceae	*Hygrophila uliginosa*	L	LC	
Plantae	Phyllanthaceae	*Hymenocardia acida*	L	LC	
Plantae	Phyllanthaceae	*Hymenocardia ulmoides*	O	LC	
Plantae	Poaceae	*Hyparrhenia sp.*	O	NE	
Plantae	Acanthaceae	*Hypoestes aristata*	L	LC	
Plantae	Fabaceae	*Indigofera paracapitata*	O	LC	
Plantae	Fabaceae	*Indigofera sp.*	O	NE	
Plantae	Podostemaceae	*Inversodicraea cristata*	L	VU	
Plantae	Podostemaceae	*Inversodicraea ledermannii*	L	LC	
Plantae	Juncaceae	*Juncus dregeanus*	L	LC	
Plantae	Juncaceae	*Juncus dregeanus subsp. bachitii*	L	LC	
Plantae	Juncaceae	*Juncus effusus*	L	LC	
Plantae	Juncaceae	*Juncus inflexus*	L	LC	
Plantae	Juncaceae	*Juncus oxycarpus*	L	LC	
Plantae	Juncaceae	*Juncus punctorius*	L	LC	

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Juncaceae	*Juncus rigidus*	L	LC	
Plantae	Acanthaceae	*Justicia bolomboensis*	L	DD	
Plantae	Meliaceae	*Khaya anthotheca*	L	VU	VU
Plantae	Hydrocharitaceae	*Lagarosiphon cordofanus*	L	LC	
Plantae	Combretaceae	*Laguncularia racemosa*	L	LC	
Plantae	Apocynaceae	*Landolphia owariensis*	O	NE	
Plantae	Anacardiaceae	*Lannea welwitschii*	O	LC	
Plantae	Podostemaceae	*Ledermanniella bifurcata*	L	VU	
Plantae	Podostemaceae	*Ledermanniella schlechteri*	L	VU	
Plantae	Araceae	*Lemna perpusilla*	L	LC	
Plantae	Fabaceae	*Leptoderris fasciculata*	O	NE	
Plantae	Alismataceae	*Limnophyton obtusifolium*	L	LC	
Plantae	Poaceae	*Loudetia simplex*	O	NE	
Plantae	Euphorbiaceae	*Macaranga gilletii*	O	NE	
Plantae	Euphorbiaceae	*Macaranga monandra*	O	LC	
Plantae	Phyllanthaceae	*Maesobotrya staudtii*	O	NE	
Plantae	Anacardiaceae	*Mangifera indica*	O	DD	
Plantae	Euphorbiaceae	*Maprounea africana*	O	NE	
Plantae	Bignoniaceae	*Markhamia obtusifolia*	O	LC	

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Bignoniaceae	*Markhamia tomentosa*	O	LC	
Plantae	Marsileaceae	*Marsilea minuta*	L	LC	
Plantae	Moraceae	*Milicia excelsa*	O	LC	VU
Plantae	Apocynaceae	*Mondia whitei*	O	NE	
Plantae	Asteraceae	*Monosis conferta*	O	NE	
Plantae	Rubiaceae	*Morinda morindoides*	O	NE	
Plantae	Fabaceae	*Mucuna pruriens*	O	NE	
Plantae	Rutaceae	*Murraya paniculata*	O	NE	
Plantae	Urticaceae	*Musanga cecropioides*	O	LC	
Plantae	Hydrocharitaceae	*Najas graminea*	L	LC	
Plantae	Hydrocharitaceae	*Najas graminea*	L	LC	
Plantae	Hydrocharitaceae	*Najas marina*	L	LC	
Plantae	Nymphaeaceae	*Nymphaea divaricata*	L	DD	
Plantae	Nymphaeaceae	*Nymphaea nouchali*	L	LC	
Plantae	Menyanthaceae	*Nymphoides brevipedicellata*	L	LC	
Plantae	Menyanthaceae	*Nymphoides forbesiana*	L	LC	
Plantae	Menyanthaceae	*Nymphoides tenuissima*	L	EN	
Plantae	Apocynaceae	*Oncinotis tenuiloba*	O	NE	
Plantae	Achariaceae	*Oncoba welwitschii*	O	LC	

Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Poaceae	*Oryza glaberrima*	L	LC	
Plantae	Poaceae	*Oryza longistaminata*	L	LC	
Plantae	Poaceae	*Oryza punctata*	L	LC	
Plantae	Poaceae	*Oryza schweinfurthiana*	L	DD	
Plantae	Hydrocharitaceae	*Ottelia muricata*	L	LC	
Plantae	Rubiaceae	*Oxyanthus unilocularis*	O	LC	
Plantae	Sapindaceae	*Pancovia laurentii*	O	NE	
Plantae	Passifloraceae	*Passiflora foetida*	O	NE	
Plantae	Fabaceae	*Pentaclethra macrophylla*	O	LC	
Plantae	Lecythidaceae	*Petersianthus macrocarpus*	O	LC	
Plantae	Acanthaceae	*Phaulopsis micrantha*	L	LC	
Plantae	Fabaceae	*Piliostigma thonningiii*	O	NE	
Plantae	Fabaceae	*Piptadeniastrum africanum*	O	LC	
Plantae	Araceae	*Pistia stratiotes*	L	LC	
Plantae	Potamogetonaceae	*Potamogeton nodosus*	L	LC	
Plantae	Potamogetonaceae	*Potamogeton octandrus*	L	LC	
Plantae	Potamogetonaceae	*Potamogeton pusillus*	L	LC	
Plantae	Potamogetonaceae	*Potamogeton schweinfurthii*	L	LC	
Plantae	Potamogetonaceae	*Potamogeton trichoides*	L	LC	

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Amaranthaceae	*Psilotrichum axilliflorum*	L	EN	
Plantae	Hypericaceae	*Psorospermum febrifugum*	O	LC	
Plantae	Rubiaceae	*Psychotria sp*	O	NE	
Plantae	Combretaceae	*Pterocarpus angolensis*	L	LC	VU
Plantae	Combretaceae	*Pteleopsis anisoptera*	O	NE	
Plantae	Combretaceae	*Pteleopsis myrtifolia*	O	DD	
Plantae	Pteridaceae	*Pteridium aquilinum*	O	NE	
Plantae	Myristicaceae	*Pycnanthus angolensis*	O	LC	
Plantae	Alismataceae	*Ranalisma humile*	L	LC	
Plantae	Arecaceae	*Raphia farinifera*	O	LC	
Plantae	Cactaceae	*Rhipsalis baccifera*	L	LC	
Plantae	Rhizophoraceae	*Rhizophora mangle*	L	LC	
Plantae	Rhizophoraceae	*Rhizophora mucronata*	L	LC	VU
Plantae	Rhizophoraceae	*Rhizophora racemosa*	L	LC	
Plantae	Cyperaceae	*Rhynchospora corymbosa*	L	LC	
Plantae	Cyperaceae	*Rhynchospora gracillima*	L	LC	
Plantae	Cyperaceae	*Rhynchospora holoschoenoides*	L	LC	
Plantae	Euphorbiaceae	*Ricinodendron heudelotii*	O	LC	VU
Plantae	Lythraceae	*Rotala gerardii*	L	NT	

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Lythraceae	*Rotala robynsiana*	L	CR	
Plantae	Lythraceae	*Rotala smithii*	L	VU	
Plantae	Connaraceae	*Rourea coccinea*	O	LC	
Plantae	Rubiaceae	*Sabicea mildbraedii*	O	NE	
Plantae	Celastraceae	*Salacia sp.*	O		
Plantae	Santalaceae	*Santalum album*	L	VU	VU
Plantae	Cyperaceae	*Schoenoplectiella mucronata*	L	LC	
Plantae	Cyperaceae	*Schoenoplectus litoralis*	L	LC	
Plantae	Cyperaceae	*Schoenoplectus subulatus*	L	LC	
Plantae	Fabaceae	*Sphenostylis stenocarpa*	O	NE	
Plantae	Araceae	*Spirodela polyrhiza*	L	LC	
Plantae	Anacardiaceae	*Spondias mombim*	O	LC	
Plantae	Myristicaceae	*Staudtia kamerunensis*	O	DD	
Plantae	Acanthaceae	*Staurogyne letestuana*	L	NT	
Plantae	Acanthaceae	*Stenandrium gabonica*	L	VU	
Plantae	Acanthaceae	*Stenandrium guineense*	L	LC	
Plantae	Menispermaceae	*Stephania abyssinica*	O	NE	
Plantae	Malvaceae	*Sterculia tragacantha*	O	LC	
Plantae	Loganiaceae	*Strychnos henningsii*	O	LC	

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Potamogetonaceae	*Stuckenia pectinata*	L	LC	
Plantae	Clusiaceae	*Symphonia globulifera*	L	LC	
Plantae	Myristicaceae	*Syzygium guineensis*	O	LC	
Plantae	Apocynaceae	*Tabernanthe iboga*	O	LC	
Plantae	Combretaceae	*Terminalia superba*	O	DD	
Plantae	Thomandersiaceae	*Thomandersia hensii*	L	LC	
Plantae	Asteraceae	*Tithonia diversifolia*	O	NE	
Plantae	Lythraceae	*Trapa natans*	L	LC	
Plantae	Cannabaceae	*Trema guineensis*	O	LC	
Plantae	Cannabaceae	*Trema orientale*	O	LC	
Plantae	Anacardiaceae	*Trichoscypha oddonii*	O	LC	
Plantae	Menispermaceae	*Triclisia dictyophylla*	O	NE	
Plantae	Moraceae	*Trilepisium madagascariense*	O	NE	
Plantae	Meliaceae	*Turraeanthus africana*	O	VU	
Plantae	Typhaceae	*Typha capensis*	L	LC	
Plantae	Typhaceae	*Typha domingensis*	L	LC	
Plantae	Typhaceae	*Typha latifolia*	L	LC	
Plantae	Fabaceae	*Uraria picta*	O	LC	
Plantae	Lentibulariaceae	*Utricularia bracteata*	L	NT	

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Kingdom	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Plantae	Lentibulariaceae	*Utricularia microcalyx*	L	LC	
Plantae	Hydrocharitaceae	*Vallisneria spiralis*	L	LC	
Plantae	Asteraceae	*Vernonia conferta*	O	DD	
Plantae	Lamiaceae	*Vitex madiensis*	O	LC	
Plantae	Araceae	*Wolffia arrhiza*	L	LC	
Plantae	Ximeniaceae	*Ximenia americana*	O	LC	
Plantae	Xyridaceae	*Xyris angustifolia*	L	NT	
Plantae	Xyridaceae	*Xyris densa*	L	DD	
Plantae	Xyridaceae	*Xyris exigua*	L	CR	
Plantae	Xyridaceae	*Xyris gossweileri*	L	DD	
Plantae	Xyridaceae	*Xyris imitatrix*	L	DD	
Plantae	Xyridaceae	*Xyris kundelungensis*	L	DD	
Plantae	Xyridaceae	*Xyris kwangolana*	L	DD	
Plantae	Xyridaceae	*Xyris lejolyanus*	L	DD	
Plantae	Xyridaceae	*Xyris sanguinea*	L	DD	
Plantae	Potamogetonaceae	*Zannichellia palustris*	L	LC	
Plantae	Araceae	*Zantedeschia albomaculata*	L	LC	
Plantae	Rutaceae	*Zanthoxylum gilletii*	O	LC	

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Table 10: Herptile and freshwater species list.

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Arthropoda	Malacostraca	*Acantharctus posteli*	L	DD	
Chordata	Amphibia	*Acanthixalus spinosus*	L	LC	
Arthropoda	Insecta	*Aciagrion africanum*	L	LC	
Arthropoda	Insecta	*Acisoma inflatum*	L	LC	
Arthropoda	Insecta	*Acisoma trifidum*	L	LC	
Arthropoda	Insecta	*Aethiothemis circe*	L	LC	
Arthropoda	Insecta	*Aethiothemis erythromelas*	L	LC	
Arthropoda	Insecta	*Aethiothemis solitaria*	L	LC	
Arthropoda	Insecta	*Aethriamanta rezia*	L	LC	
Arthropoda	Insecta	*Africallagma vaginale*	L	LC	
Mollusca	Gastropoda	*Africanogyrus coretus*	L	LC	
Chordata	Amphibia	*Afrixalus dorsalis*	L	LC	
Chordata	Amphibia	*Afrixalus osorioi*	L	LC	
Chordata	Amphibia	*Afrixalus quadrivittatus*	L	LC	
Chordata	Reptilia	*Afrotyphlops angolensis*	L	LC	
Chordata	Reptilia	*Afrotyphlops congestus*	L	LC	
Chordata	Reptilia	*Afrotyphlops lineolatus*	L	LC	
Chordata	Reptilia	*Afrotyphlops mucruso*	L	LC	
Chordata	Reptilia	*Agama agama*	O	LC	
Arthropoda	Insecta	*Agriocnemis exilis*	L	LC	
Arthropoda	Insecta	*Agriocnemis forcipata*	L	LC	
Arthropoda	Insecta	*Agriocnemis maclachlani*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Arthropoda	Insecta	*Agriocnemis victoria*	L	LC	
Arthropoda	Insecta	*Allocnemis nigripes*	L	LC	
Chordata	Amphibia	*Amnirana albolabris*	L	LC	
Chordata	Amphibia	*Amnirana lepus*	L	LC	
Chordata	Actinopterygii	*Amphilius brevis*	L	LC	
Chordata	Actinopterygii	*Amphilius mamonekenensis*	L	VU	
Arthropoda	Insecta	*Anax chloromelas*	L	LC	
Arthropoda	Insecta	*Anax ephippiger*	L	LC	
Arthropoda	Insecta	*Anax imperator*	L	LC	
Arthropoda	Insecta	*Anax tristis*	L	LC	
Mollusca	Gastropoda	*Angiola lineata*	L	LC	
Chordata	Reptilia	*Aparallactus modestus*	L	LC	
Chordata	Actinopterygii	*Aphyosemion australe*	L	LC	
Chordata	Actinopterygii	*Aphyosemion escherichi*	L	LC	
Chordata	Actinopterygii	*Aphyosemion schioetzi*	L	LC	
Chordata	Actinopterygii	*Aphyosemion striatum*	L	LC	
Chordata	Actinopterygii	*Aplocheilichthys spilauchen*	L	LC	
Chordata	Amphibia	*Arthroleptis taeniatus*	L	LC	
Mollusca	Bivalvia	*Aspatharia pfeifferiana*	L	LC	
Mollusca	Gastropoda	*Assiminea hessei*	L	DD	
Chordata	Reptilia	*Atheris anisolepis*	L	LC	
Arthropoda	Insecta	*Atoconeura luxata*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Reptilia	*Atractaspis boulengeri*	L	LC	
Chordata	Reptilia	*Atractaspis congica*	L	LC	
Chordata	Reptilia	*Atractaspis irregularis*	L	LC	
Chordata	Reptilia	*Atractaspis reticulata*	L	LC	
Arthropoda	Malacostraca	*Atya africana*	L	LC	
Chordata	Actinopterygii	*Awaous lateristriga*	L	LC	
Arthropoda	Insecta	*Azuragrion nigridorsum*	L	LC	
Chordata	Actinopterygii	*Bathygobius casamancus*	L	LC	
Chordata	Actinopterygii	*Bathygobius soporator*	L	LC	
Mollusca	Gastropoda	*Biomphalaria pfeifferi*	L	LC	
Mollusca	Gastropoda	*Biomphalaria sp.*	O		
Chordata	Reptilia	*Bitis gabonica*	L	VU	
Chordata	Reptilia	*Bitis nasicornis*	L	VU	
Chordata	Reptilia	*Boaedon fuliginosus*	L	LC	
Chordata	Reptilia	*Boaedon lineatus*	L	LC	
Chordata	Reptilia	*Boaedon littoralis*	L	LC	
Chordata	Reptilia	*Boaedon olivaceus*	L	LC	
Chordata	Reptilia	*Boaedon virgatus*	L	LC	
Chordata	Actinopterygii	*Bostrychus africanus*	L	LC	
Chordata	Reptilia	*Bothrophthalmus lineatus*	L	LC	
Arthropoda	Insecta	*Brachythemis impartita*	L	LC	
Arthropoda	Insecta	*Brachythemis lacustris*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Arthropoda	Insecta	*Brachythemis leucosticta*	L	LC	
Arthropoda	Insecta	*Bradinopyga strachani*	L	LC	
Chordata	Actinopterygii	*Brienomyrus brachyistius*	L	LC	
Chordata	Actinopterygii	*Brycinus carmesinus*	L	DD	
Chordata	Actinopterygii	*Brycinus grandisquamis*	L	LC	
Chordata	Actinopterygii	*Brycinus imberi*	L	LC	
Chordata	Actinopterygii	*Brycinus kingsleyae*	L	LC	
Chordata	Actinopterygii	*Brycinus macrolepidotus*	L	LC	
Chordata	Actinopterygii	*Brycinus nurse*	L	LC	
Chordata	Actinopterygii	*Bryconaethiops microstoma*	L	LC	
Chordata	Actinopterygii	*Bryconalestes longipinnis*	L	LC	
Mollusca	Gastropoda	*Bulinus globosus*	L	LC	
Mollusca	Gastropoda	*Bulinus truncatus*	L	LC	
Chordata	Reptilia	*Calabaria reinhardtii*	L	LC	
Arthropoda	Malacostraca	*Callinectes sp.*	O	NE	
Chordata	Actinopterygii	*Caranx hippos*	L	LC	
Chordata	Chondrichthyes	*Carcharhinus leucas*	L	VU	
Chordata	Amphibia	*Cardioglossa leucomystax*	O	LC	
Chordata	Reptilia	*Caretta caretta*	L	VU	VU
Arthropoda	Malacostraca	*Caridina togoensis*	O	LC	
Chordata	Actinopterygii	*Carlarius latiscutatus*	L	LC	
Chordata	Actinopterygii	*Carlarius parkii*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Reptilia	*Causus lichtensteinii*	L	LC	
Chordata	Reptilia	*Causus maculatus*	L	LC	
Chordata	Reptilia	*Causus resimus*	L	LC	
Mollusca	Gastropoda	*Ceratophallus natalensis*	L	LC	
Arthropoda	Insecta	*Ceriagrion annulatum*	L	LC	
Arthropoda	Insecta	*Ceriagrion bakeri*	L	LC	
Arthropoda	Insecta	*Ceriagrion corallinum*	L	LC	
Arthropoda	Insecta	*Ceriagrion glabrum*	L	LC	
Arthropoda	Insecta	*Ceriagrion platystigma*	L	LC	
Arthropoda	Insecta	*Ceriagrion whellani*	L	LC	
Arthropoda	Insecta	*Chalcostephia flavifrons*	L	LC	
Chordata	Reptilia	*Chamaeleo dilepis*	L	LC	
Chordata	Reptilia	*Chamaeleo gracilis*	L	LC	
Chordata	Reptilia	*Chamaelycus christyi*	L	LC	
Chordata	Reptilia	*Chamaelycus fasciatus*	L	LC	
Chordata	Actinopterygii	*Channallabes apus*	L	LC	
Chordata	Actinopterygii	*Chelon saliens*	L	LC	
Chordata	Actinopterygii	*Chilochromis duponti*	L	LC	
Chordata	Actinopterygii	*Chiloglanis batesii*	L	LC	
Chordata	Actinopterygii	*Chiloglanis cameronensis*	L	LC	
Chordata	Amphibia	*Chiromantis rufescens*	L	LC	
Arthropoda	Insecta	*Chlorocypha cancellata*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Arthropoda	Insecta	*Chlorocypha curta*	L	LC	
Arthropoda	Insecta	*Chlorocypha victoriae*	L	LC	
Chordata	Actinopterygii	*Chromidotilapia elongata*	L	DD	
Chordata	Actinopterygii	*Chromidotilapia mamonekenei*	L	LC	
Chordata	Actinopterygii	*Chrysichthys auratus*	L	LC	
Chordata	Actinopterygii	*Chrysichthys dendrophorus*	L	VU	
Chordata	Actinopterygii	*Chrysichthys furcatus*	L	DD	
Chordata	Actinopterygii	*Chrysichthys nigrodigitatus*	L	LC	
Chordata	Actinopterygii	*Chrysichthys nigrodigitatus*	O	LC	
Chordata	Actinopterygii	*Citharichthys stampflii*	L	LC	
Chordata	Actinopterygii	*Clarias angolensis*	L	LC	
Chordata	Actinopterygii	*Clarias buthupogon*	L	LC	
Chordata	Actinopterygii	*Clarias camerunensis*	L	LC	
Chordata	Actinopterygii	*Clarias gabonensis*	L	LC	
Chordata	Actinopterygii	*Clarias gariepinus*	L	LC	
Mollusca	Gastropoda	*Clypeolum owenianum*	L	LC	
Mollusca	Bivalvia	*Coelatura gabonensis*	L	LC	
Chordata	Amphibia	*Conraua crassipes*	L	LC	
Mollusca	Gastropoda	*Conus ambiguus*	L	LC	
Mollusca	Gastropoda	*Conus ermineus*	L	LC	
Mollusca	Gastropoda	*Conus genuanus*	L	LC	
Mollusca	Gastropoda	*Conus pulcher*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mollusca	Gastropoda	*Conus tabidus*	L	LC	
Arthropoda	Insecta	*Copelatus peridinus*	L	LC	
Arthropoda	Insecta	*Copelatus pulchellus*	L	LC	
Arthropoda	Insecta	*Copera rufipes*	L	LC	
Chordata	Actinopterygii	*Coptodon guineensis*	L	LC	
Chordata	Actinopterygii	*Coptodon guineensis*	O	LC	
Chordata	Actinopterygii	*Coptodon rendalli*	L	LC	
Chordata	Actinopterygii	*Coptodon tholloni*	L	LC	
Chordata	Actinopterygii	*Coptodon zillii*	L	LC	
Mollusca	Bivalvia	*Corbicula africana*	L	LC	
Mollusca	Bivalvia	*Crassostrea tulipa*	L	LC	
Chordata	Reptilia	*Crocodylus niloticus*	L	LC	VU
Arthropoda	Insecta	*Crocothemis divisa*	L	LC	
Arthropoda	Insecta	*Crocothemis erythraea*	L	LC	
Arthropoda	Insecta	*Crocothemis sanguinolenta*	L	LC	
Chordata	Reptilia	*Crotaphopeltis hotamboeia*	L	LC	
Chordata	Amphibia	*Cryptothylax greshoffii*	L	LC	
Chordata	Actinopterygii	*Ctenogobius lepturus*	L	LC	
Chordata	Actinopterygii	*Ctenopoma kingsleyae*	L	LC	
Chordata	Actinopterygii	*Ctenopoma nigropannosum*	L	LC	
Chordata	Reptilia	*Cycloderma aubryi*	L	VU	
Mollusca	Bivalvia	*Cyrenoida dupontia*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Actinopterygii	*Dalophis boulengeri*	L	LC	
Chordata	Actinopterygii	*Dalophis cephalopeltis*	L	LC	
Chordata	Reptilia	*Dasypeltis confusa*	L	LC	
Chordata	Reptilia	*Dasypeltis fasciata*	L	LC	
Chordata	Reptilia	*Dasypeltis palmarum*	L	LC	
Chordata	Reptilia	*Dasypeltis scabra*	L	LC	
Chordata	Reptilia	*Dendroaspis jamesoni*	O	LC	
Chordata	Reptilia	*Dermochelys coriacea*	L	VU	EN-CR
Arthropoda	Malacostraca	*Desmocaris trispinosa*	L	LC	
Arthropoda	Insecta	*Diplacodes lefebvrii*	L	LC	
Arthropoda	Insecta	*Diplacodes luminans*	L	LC	
Chordata	Reptilia	*Dipsadoboa duchesnii*	L	LC	
Chordata	Reptilia	*Dipsadoboa unicolor*	L	LC	
Chordata	Reptilia	*Dipsadoboa viridis*	L	LC	
Chordata	Reptilia	*Dipsadoboa weileri*	L	LC	
Chordata	Reptilia	*Dispholidus typus*	L	LC	
Chordata	Actinopterygii	*Distichodus notospilus*	L	LC	
Chordata	Actinopterygii	*Divandu albimarginatus*	L	LC	
Chordata	Actinopterygii	*Dolichallabes microphthalmus*	L	LC	
Chordata	Actinopterygii	*Dormitator lebretonis*	L	LC	
Chordata	Actinopterygii	*Doumea typica*	L	LC	
Chordata	Reptilia	*Elapsoidea guentherii*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Reptilia	*Elapsoidea semiannulata*	L	LC	
Arthropoda	Insecta	*Elattoneura acuta*	L	LC	
Arthropoda	Insecta	*Elattoneura glauca*	L	LC	
Arthropoda	Insecta	*Elattoneura josemorai*	L	LC	
Arthropoda	Insecta	*Elattoneura vittata*	L	LC	
Chordata	Actinopterygii	*Eleotris daganensis*	L	LC	
Chordata	Actinopterygii	*Eleotris senegalensis*	L	LC	
Chordata	Actinopterygii	*Eleotris vittata*	L	LC	
Chordata	Actinopterygii	*Elops lacerta*	L	LC	
Chordata	Actinopterygii	*Elops senegalensis*	L	DD	
Chordata	Actinopterygii	*Enneacampus ansorgii*	L	LC	
Chordata	Actinopterygii	*Enneacampus kaupi*	L	LC	
Chordata	Actinopterygii	*Enteromius camptacanthus*	L	LC	
Chordata	Actinopterygii	*Enteromius carens*	L	LC	
Chordata	Actinopterygii	*Enteromius collarti*	L	VU	
Chordata	Actinopterygii	*Enteromius guirali*	L	LC	
Chordata	Actinopterygii	*Enteromius holotaenia*	L	LC	
Chordata	Actinopterygii	*Enteromius jae*	L	LC	
Chordata	Actinopterygii	*Enteromius miolepis*	L	LC	
Chordata	Actinopterygii	*Enteromius parajae*	L	LC	
Chordata	Actinopterygii	*Enteromius rubrostigma*	L	LC	
Chordata	Actinopterygii	*Enteromius stauchi*	L	EN	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Actinopterygii	*Enteromius trispilomimus*	L	LC	
Chordata	Actinopterygii	*Epiplatys ansorgii*	L	LC	
Chordata	Actinopterygii	*Epiplatys multifasciatus*	L	DD	
Chordata	Actinopterygii	*Epiplatys singa*	L	LC	
Chordata	Reptilia	*Eretmochelys imbricata*	L	CR	VU
Arthropoda	Malacostraca	*Erimetopus brazzae*	L	LC	
Mollusca	Bivalvia	*Etheria elliptica*	L	LC	
Chordata	Actinopterygii	*Ethmalosa fimbriata*	L	LC	VU
Chordata	Actinopterygii	*Eucinostomus melanopterus*	L	LC	
Chordata	Actinopterygii	*Eugnathichthys macroterolepis*	L	LC	
Mollusca	Bivalvia	*Eupera ferruginea*	L	LC	
Mollusca	Bivalvia	*Eupera sturanyi*	L	LC	
Chordata	Reptilia	*Feylinia currori*	L	LC	
Chordata	Reptilia	*Feylinia elegans*	L	LC	
Chordata	Reptilia	*Feylinia grandisquamis*	L	LC	
Chordata	Reptilia	*Feylinia macrolepis*	L	LC	
Chordata	Chondrichthyes	*Fontitrygon ukpam*	L	CR	
Mollusca	Bivalvia	*Galatea bengoensis*	L	LC	
Mollusca	Bivalvia	*Galatea bernardii*	L	LC	
Mollusca	Bivalvia	*Galatea cailliaudi*	L	LC	
Mollusca	Bivalvia	*Galatea congica*	L	LC	
Mollusca	Bivalvia	*Galatea heukelomii*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mollusca	Bivalvia	*Galatea nux*	L	LC	
Mollusca	Bivalvia	*Galatea paradoxa*	L	LC	
Mollusca	Bivalvia	*Galatea tenuicula*	L	LC	
Chordata	Actinopterygii	*Garra ornata*	L	LC	
Chordata	Amphibia	*Geotrypetes seraphini*	L	LC	
Chordata	Actinopterygii	*Gerres nigri*	L	LC	
Chordata	Reptilia	*Gerrhosaurus multilineatus*	O	LC	
Chordata	Reptilia	*Gerrhosaurus nigrolineatus*	O	LC	
Chordata	Actinopterygii	*Gobioides africanus*	L	LC	
Chordata	Actinopterygii	*Gobioides sagitta*	L	LC	
Chordata	Actinopterygii	*Gobionellus occidentalis*	L	LC	
Arthropoda	Insecta	*Gomphidia quarrei*	L	LC	
Chordata	Reptilia	*Gonionotophis brussauxi*	L	LC	
Chordata	Reptilia	*Grayia caesar*	L	LC	
Chordata	Reptilia	*Grayia ornata*	L	LC	
Chordata	Reptilia	*Grayia smithii*	L	LC	
Chordata	Reptilia	*Grayia tholloni*	L	LC	
Arthropoda	Insecta	*Gynacantha africana*	L	LC	
Arthropoda	Insecta	*Gynacantha bullata*	L	LC	
Arthropoda	Insecta	*Gynacantha cylindrata*	L	LC	
Arthropoda	Insecta	*Gynacantha sextans*	L	LC	
Arthropoda	Insecta	*Gynacantha vesiculata*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mollusca	Gastropoda	*Gyraulus costulatus*	L	LC	
Arthropoda	Insecta	*Hadrothemis camarensis*	L	LC	
Arthropoda	Insecta	*Hadrothemis coacta*	L	LC	
Arthropoda	Insecta	*Hadrothemis defecta*	L	LC	
Arthropoda	Insecta	*Hadrothemis sp.*	O	NE	
Arthropoda	Insecta	*Hadrothemis versuta*	L	LC	
Chordata	Reptilia	*Hapsidophrys lineatus*	L	LC	
Chordata	Reptilia	*Hapsidophrys smaragdinus*	L	LC	
Arthropoda	Insecta	*Heliaeschna cynthiae*	L	LC	
Arthropoda	Insecta	*Heliaeschna fuliginosa*	L	LC	
Arthropoda	Insecta	*Heliaeschna ugandica*	L	LC	
Chordata	Actinopterygii	*Hemichromis elongatus*	L	LC	
Chordata	Actinopterygii	*Hemichromis fasciatus*	L	LC	
Chordata	Reptilia	*Hemidactylus longicephalus*	L	LC	
Chordata	Reptilia	*Hemidactylus mabouia*	L	LC	
Arthropoda	Insecta	*Hemistigma albipunctum*	L	LC	
Chordata	Amphibia	*Hemisus perreti*	L	LC	
Chordata	Actinopterygii	*Hepsetus lineata*	L	LC	
Chordata	Amphibia	*Herpele squalostoma*	L	LC	
Chordata	Actinopterygii	*Heteromycteris proboscideus*	L	DD	
Chordata	Amphibia	*Hoplobatrachus occipitalis*	L	LC	
Chordata	Reptilia	*Hormonotus modestus*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Reptilia	*Hydraethiops melanogaster*	L	LC	
Chordata	Amphibia	*Hymenochirus boettgeri*	L	LC	
Chordata	Amphibia	*Hyperolius adspersus*	L	LC	
Chordata	Amphibia	*Hyperolius cinnamomeoventris*	L	LC	
Chordata	Amphibia	*Hyperolius dartevellei*	L	LC	
Chordata	Amphibia	*Hyperolius lucani*	L	DD	
Chordata	Amphibia	*Hyperolius maestus*	L	DD	
Chordata	Amphibia	*Hyperolius ocellatus*	L	LC	
Chordata	Amphibia	*Hyperolius parallelus*	L	LC	
Chordata	Amphibia	*Hyperolius platyceps*	L	LC	
Chordata	Amphibia	Hyperolius protchei	L	DD	
Chordata	Amphibia	*Hyperolius rhizophilus*	L	DD	
Chordata	Amphibia	Hyperolius sp.	O	NE	
Chordata	Amphibia	*Hyperolius tuberculatus*	L	LC	
Arthropoda	Insecta	*Ictinogomphus regisalberti*	L	LC	
Chordata	Reptilia	*Indotyphlops braminus*	L	LC	
Mollusca	Bivalvia	*Iphigenia curta*	L	LC	
Mollusca	Bivalvia	*Iphigenia delessertii*	L	LC	
Mollusca	Bivalvia	*Iphigenia laevigata*	L	LC	
Arthropoda	Insecta	*Ischnura senegalensis*	L	LC	
Chordata	Actinopterygii	*Isichthys henryi*	L	LC	
Chordata	Actinopterygii	*Labeo batesii*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Actinopterygii	*Labeo chariensis*	L	LC	
Chordata	Actinopterygii	*Labeo coubie*	L	LC	
Chordata	Actinopterygii	*Labeo lukulae*	L	LC	
Chordata	Actinopterygii	*Labeobarbus aspius*	L	LC	
Chordata	Actinopterygii	*Labeobarbus axelrodi*	L	LC	
Chordata	Actinopterygii	*Labeobarbus cardozoi*	L	LC	
Chordata	Actinopterygii	*Labeobarbus caudovittatus*	L	LC	
Chordata	Actinopterygii	*Labeobarbus compiniei*	L	LC	
Chordata	Actinopterygii	*Labeobarbus progenys*	L	LC	
Chordata	Actinopterygii	*Labeobarbus roylii*	L	EN	
Chordata	Actinopterygii	*Labeobarbus sandersi*	L	LC	
Chordata	Actinopterygii	*Labeobarbus steindachneri*	L	LC	
Chordata	Reptilia	*Lacertaspis reichenowi*	L	LC	
Chordata	Actinopterygii	*Laeviscutella dekimpei*	L	LC	
Mollusca	Gastropoda	*Lanistes ovum*	L	LC	
Chordata	Amphibia	*Leptopelis aubryi*	L	LC	
Chordata	Amphibia	*Leptopelis boulengeri*	L	LC	
Chordata	Amphibia	*Leptopelis notatus*	L	LC	
Chordata	Amphibia	*Leptopelis ocellatus*	L	LC	
Chordata	Amphibia	*Leptopelis rufus*	L	LC	
Chordata	Reptilia	*Leptotyphlops kafubi*	L	LC	
Arthropoda	Insecta	*Lestes dissimulans*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Arthropoda	Insecta	*Lestes tridens*	L	LC	
Arthropoda	Insecta	*Lestinogomphus congoensis*	L	LC	
Chordata	Reptilia	*Letheobia praeocularis*	L	LC	
Chordata	Reptilia	*Limaformosa guirali*	L	LC	
Chordata	Reptilia	*Limaformosa savorgnani*	L	LC	
Mollusca	Gastropoda	*Littoraria angulifera*	L	LC	
Chordata	Actinopterygii	*Lutjanus endecacanthus*	L	DD	
Chordata	Actinopterygii	*Lutjanus goreensis*	L	DD	
Chordata	Reptilia	*Lycophidion laterale*	L	LC	
Chordata	Reptilia	*Lycophidion meleagre*	L	LC	
Chordata	Reptilia	*Lycophidion multimaculatum*	L	LC	
Chordata	Reptilia	*Lycophidion ornatum*	L	LC	
Chordata	Gastropoda	*Lymnaeae sp.*	O	NE	
Arthropoda	Malacostraca	*Macrobrachium chevalieri*	L	LC	
Arthropoda	Malacostraca	*Macrobrachium dux*	L	LC	
Arthropoda	Malacostraca	*Macrobrachium felicinum*	L	DD	
Arthropoda	Malacostraca	*Macrobrachium lujae*	L	DD	
Arthropoda	Malacostraca	*Macrobrachium macrobrachion*	L	LC	
Arthropoda	Malacostraca	*Macrobrachium sollaudii*	L	LC	
Arthropoda	Malacostraca	*Macrobrachium sp.*	O	NE	
Arthropoda	Malacostraca	*Macrobrachium vollenhoveni*	L	LC	
Chordata	Actinopterygii	*Malapterurus beninensis*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Arthropoda	Insecta	*Malgassophlebia bispina*	L	LC	
Chordata	Actinopterygii	*Marcusenius moorii*	L	LC	
Chordata	Actinopterygii	*Mastacembelus flavomarginatus*	L	LC	
Chordata	Actinopterygii	*Mastacembelus niger*	L	LC	
Chordata	Actinopterygii	*Mastacembelus shiloangoensis*	L	DD	
Chordata	Reptilia	*Mecistops cataphractus*	L	CR	VU
Chordata	Reptilia	*Mehelya poensis*	L	LC	
Mollusca	Gastropoda	*Melampus liberianus*	L	LC	
Mollusca	Gastropoda	*Melanoides tuberculata*	L	LC	
Arthropoda	Insecta	*Mesocnemis singularis*	L	LC	
Chordata	Actinopterygii	*Microctenopoma ansorgii*	L	LC	
Chordata	Actinopterygii	*Microctenopoma congicum*	L	LC	
Chordata	Actinopterygii	*Microctenopoma nanum*	L	LC	
Arthropoda	Insecta	*Micromacromia camerunica*	L	LC	
Chordata	Reptilia	*Mochlus striatus*	L	LC	
Chordata	Reptilia	*Monopeltis guentheri*	L	LC	
Chordata	Reptilia	*Monopeltis vanderysti*	L	LC	
Chordata	Actinopterygii	*Mormyrops zanclirostris*	L	LC	
Chordata	Actinopterygii	*Mormyrus rume*	L	LC	
Chordata	Actinopterygii	*Mugil cephalus*	L	LC	
Chordata	Actinopterygii	*Mugil curema*	L	LC	
Mollusca	Bivalvia	*Mutela rostrata*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mollusca	Bivalvia	*Mytilopsis africana*	L	LC	
Chordata	Reptilia	*Naja annulata*	L	LC	
Chordata	Reptilia	*Naja christyi*	L	LC	
Chordata	Reptilia	*Naja melanoleuca*	L	LC	
Chordata	Reptilia	*Naja multifasciata*	L	LC	
Chordata	Reptilia	*Naja nigricollis*	L	LC	
Chordata	Reptilia	*Naja subfulva*	L	LC	
Chordata	Actinopterygii	*Nannaethiops unitaeniatus*	L	LC	
Chordata	Actinopterygii	*Nannocharax parvus*	L	LC	
Chordata	Actinopterygii	*Nannopetersius lamberti*	L	LC	
Chordata	Reptilia	*Natriciteres fuliginoides*	L	LC	
Chordata	Reptilia	*Natriciteres olivacea*	L	LC	
Chordata	Reptilia	*Natriciteres variegata*	L	LC	
Chordata	Actinopterygii	*Nematogobius maindroni*	L	LC	
Arthropoda	Insecta	*Neodythemis klingi*	L	LC	
Arthropoda	Insecta	*Neodythemis preussi*	L	LC	
Chordata	Actinopterygii	*Neolebias ansorgii*	L	LC	
Chordata	Actinopterygii	*Neolebias spilotaenia*	L	VU	
Mollusca	Gastropoda	*Nerita senegalensis*	L	LC	
Arthropoda	Insecta	*Neurolestes trinervis*	L	LC	
Arthropoda	Insecta	*Notiothemis robertsi*	L	LC	
Chordata	Actinopterygii	*Notoglanidium macrostoma*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Actinopterygii	*Notoglanidium pallidum*	L	VU	
Arthropoda	Insecta	*Notogomphus spinosus*	L	LC	
Chordata	Actinopterygii	*Odaxothrissa ansorgii*	L	LC	
Chordata	Actinopterygii	*Odaxothrissa vittata*	L	LC	
Arthropoda	Insecta	*Olpogastra lugubris*	L	LC	
Chordata	Amphibia	*Opisthothylax immaculatus*	L	LC	
Chordata	Actinopterygii	*Opsaridium ubangiense*	L	LC	
Chordata	Actinopterygii	*Oreochromis schwebischi*	L	LC	
Arthropoda	Insecta	*Orthetrum abbotti*	L	LC	
Arthropoda	Insecta	*Orthetrum africanum*	L	LC	
Arthropoda	Insecta	*Orthetrum austeni*	L	LC	
Arthropoda	Insecta	*Orthetrum brachiale*	L	LC	
Arthropoda	Insecta	*Orthetrum chrysostigma*	L	LC	
Arthropoda	Insecta	*Orthetrum guineense*	L	LC	
Arthropoda	Insecta	*Orthetrum hintzi*	L	LC	
Arthropoda	Insecta	*Orthetrum icteromelas*	L	LC	
Arthropoda	Insecta	*Orthetrum julia*	L	LC	
Arthropoda	Insecta	*Orthetrum microstigma*	L	LC	
Arthropoda	Insecta	*Orthetrum saegeri*	L	LC	
Arthropoda	Insecta	*Orthetrum stemmale*	L	LC	
Chordata	Reptilia	*Osteolaemus tetraspis*	L	VU	
Arthropoda	Insecta	*Oxythemis phoenicosceles*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mollusca	Gastropoda	*Pachymelania aurita*	L	LC	
Mollusca	Gastropoda	*Pachymelania fusca*	L	LC	
Arthropoda	Insecta	*Palpopleura lucia*	O	LC	
Arthropoda	Insecta	*Palpopleura portia*	L	LC	
Chordata	Reptilia	*Panaspis breviceps*	L	LC	
Chordata	Reptilia	*Panaspis cabindae*	L	LC	
Arthropoda	Insecta	*Pantala flavescens*	L	LC	
Arthropoda	Malacostraca	*Panulirus regius*	L	DD	
Chordata	Actinopterygii	*Parachanna insignis*	L	LC	
Chordata	Actinopterygii	*Parachanna obscura*	L	LC	
Chordata	Actinopterygii	*Paradoxoglanis parvus*	L	LC	
Chordata	Actinopterygii	*Parailia occidentalis*	L	LC	
Chordata	Actinopterygii	*Paramormyrops kingsleyae*	L	LC	
Chordata	Actinopterygii	*Paramphilius baudoni*	L	LC	
Chordata	Actinopterygii	*Parananochromis longirostris*	L	LC	
Chordata	Actinopterygii	*Parasicydium bandama*	L	LC	
Arthropoda	Insecta	*Paratettix asbenensis*	L	LC	
Chordata	Actinopterygii	*Parauchenoglanis altipinnis*	L	LC	
Chordata	Actinopterygii	*Parauchenoglanis balayi*	L	LC	
Arthropoda	Insecta	*Parazyxomma flavicans*	L	LC	
Chordata	Actinopterygii	*Pareutropius debauwi*	L	LC	
Chordata	Actinopterygii	*Pellonula leonensis*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Actinopterygii	*Pellonula vorax*	L	LC	
Chordata	Actinopterygii	*Pelmatochromis nigrofasciatus*	L	LC	
Chordata	Actinopterygii	*Pelmatolapia cabrae*	L	LC	
Chordata	Actinopterygii	*Pelvicachromis subocellatus*	L	LC	
Chordata	Actinopterygii	*Periophthalmus barbarus*	L	LC	
Chordata	Actinopterygii	*Petrocephalus balayi*	L	LC	
Chordata	Actinopterygii	*Petrocephalus microphthalmus*	L	LC	
Arthropoda	Insecta	*Phaon camerunensis*	L	LC	
Arthropoda	Insecta	*Phaon iridipennis*	L	LC	
Chordata	Actinopterygii	*Phenacogrammus ansorgii*	L	LC	
Chordata	Reptilia	*Philothamnus angolensis*	O	LC	
Chordata	Reptilia	*Philothamnus carinatus*	L	LC	
Chordata	Reptilia	*Philothamnus dorsalis*	L	LC	
Chordata	Reptilia	*Philothamnus heterodermus*	L	LC	
Chordata	Reptilia	*Philothamnus heterolepidotus*	L	LC	
Chordata	Reptilia	*Philothamnus hoplogaster*	L	LC	
Chordata	Reptilia	*Philothamnus hughesi*	L	LC	
Chordata	Reptilia	*Philothamnus nitidus*	L	LC	
Chordata	Reptilia	*Philothamnus semivariegatus*	L	LC	
Chordata	Amphibia	*Phlyctimantis leonardi*	L	LC	
Chordata	Actinopterygii	*Phractura brevicauda*	L	LC	
Chordata	Actinopterygii	*Phractura longicauda*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Amphibia	*Phrynobatrachus auritus*	L	LC	
Arthropoda	Insecta	*Phyllogomphus coloratus*	L	LC	
Arthropoda	Insecta	*Phyllogomphus selysi*	L	LC	
Arthropoda	Insecta	*Phyllomacromia aequatorialis*	L	LC	
Arthropoda	Insecta	*Phyllomacromia aureozona*	L	LC	
Arthropoda	Insecta	*Phyllomacromia bicristulata*	L	LC	
Arthropoda	Insecta	*Phyllomacromia contumax*	L	LC	
Arthropoda	Insecta	*Phyllomacromia melania*	L	LC	
Arthropoda	Insecta	*Phyllomacromia overlaeti*	L	LC	
Arthropoda	Insecta	*Phyllomacromia paula*	L	LC	
Mollusca	Gastropoda	*Pila ovata*	L	LC	
Arthropoda	Insecta	*Platycypha lacustris*	L	LC	
Arthropoda	Insecta	*Platycypha rufitibia*	L	LC	
Chordata	Reptilia	*Polemon bocourti*	L	LC	
Chordata	Reptilia	*Polemon collaris*	L	LC	
Chordata	Reptilia	*Polemon fulvicollis*	L	LC	
Chordata	Reptilia	*Polemon gabonensis*	L	LC	
Chordata	Reptilia	*Polemon notatus*	L	LC	
Chordata	Reptilia	*Polemon robustus*	L	LC	
Arthropoda	Malacostraca	*Polycheles typhlops*	L	LC	
Chordata	Actinopterygii	*Pomadasys jubelini*	L	LC	
Chordata	Actinopterygii	*Porogobius schlegelii*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Reptilia	*Poromera fordii*	L	LC	
Arthropoda	Insecta	*Porpax asperipes*	L	LC	
Mollusca	Gastropoda	*Potadoma freethi*	L	NT	
Arthropoda	Malacostraca	*Potamonautes ballayi*	L	LC	
Arthropoda	Malacostraca	*Potamonautes dybowskii*	L	LC	
Arthropoda	Malacostraca	*Potamonautes walderi*	L	LC	
Mollusca	Gastropoda	*Potamopyrgus ciliatus*	L	LC	
Chordata	Chondrichthyes	*Pristis pristis*	L	CR	
Chordata	Actinopterygii	*Procatopus cabindae*	L	LC	
Chordata	Actinopterygii	*Procatopus loemensis*	L	LC	
Chordata	Reptilia	*Prosymna ambigua*	L	LC	
Chordata	Sarcopterygii	*Protopterus aethiopicus*	L	LC	
Chordata	Sarcopterygii	*Protopterus dolloi*	L	LC	
Chordata	Reptilia	*Psammophis mossambicus*	L	LC	
Arthropoda	Insecta	*Pseudagrion bernardi*	L	LC	
Arthropoda	Insecta	*Pseudagrion glaucescens*	L	LC	
Arthropoda	Insecta	*Pseudagrion grilloti*	L	LC	
Arthropoda	Insecta	*Pseudagrion hamoni*	L	LC	
Arthropoda	Insecta	*Pseudagrion kersteni*	L	LC	
Arthropoda	Insecta	*Pseudagrion kibalense*	L	LC	
Arthropoda	Insecta	*Pseudagrion melanicterum*	L	LC	
Arthropoda	Insecta	*Pseudagrion nubicum*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Arthropoda	Insecta	*Pseudagrion serrulatum*	L	LC	
Arthropoda	Insecta	*Pseudagrion simonae*	L	LC	
Arthropoda	Insecta	*Pseudagrion sjoestedti*	L	LC	
Arthropoda	Insecta	*Pseudagrion sublacteum*	L	LC	
Chordata	Reptilia	*Pseudohaje goldii*	L	LC	
Chordata	Amphibia	*Ptychadena aequiplicata*	L	LC	
Chordata	Amphibia	*Ptychadena anchietae*	L	LC	
Chordata	Amphibia	*Ptychadena perreti*	L	LC	
Chordata	Amphibia	*Ptychadena taenioscelis*	L	LC	
Chordata	Reptilia	*Python sebae*	O	NT	VU
Mollusca	Gastropoda	*Radix natalensis*	L	LC	
Chordata	Actinopterygii	*Raiamas buchholzi*	L	LC	
Chordata	Reptilia	*Rhamnophis aethiopissa*	L	LC	
Chordata	Reptilia	*Rhamnophis batesii*	L	LC	
Chordata	Reptilia	*Rhampholeon spectrum*	L	LC	
Arthropoda	Insecta	*Rhyothemis fenestrina*	L	LC	
Arthropoda	Insecta	*Rhyothemis notata*	L	LC	
Arthropoda	Insecta	*Rhyothemis semihyalina*	L	LC	
Arthropoda	Insecta	*Sapho gloriosa*	L	LC	
Arthropoda	Insecta	*Sapho orichalcea*	L	LC	
Chordata	Actinopterygii	*Sarotherodon melanotheron*	L	LC	
Chordata	Reptilia	*Scaphiophis albopunctatus*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Amphibia	*Sclerophrys buchneri*	L	DD	
Chordata	Amphibia	*Sclerophrys funerea*	L	LC	
Chordata	Amphibia	*Sclerophrys latifrons*	L	LC	
Chordata	Amphibia	*Sclerophrys pusilla*	O	LC	
Chordata	Amphibia	*Sclerophrys regularis*	L	LC	
Chordata	Amphibia	*Scotobleps gabonicus*	L	LC	
Arthropoda	Malacostraca	*Scyllarides herklotsii*	L	DD	
Arthropoda	Malacostraca	*Scyllarus caparti*	L	LC	
Arthropoda	Malacostraca	*Scyllarus paradoxus*	L	DD	
Arthropoda	Malacostraca	*Scyllarus subarctus*	L	DD	
Mollusca	Gastropoda	*Segmentorbis angustus*	L	LC	
Chordata	Reptilia	*Sepsina bayonii*	L	LC	
Arthropoda	Insecta	*Stenocnemis pachystigma*	L	LC	
Arthropoda	Malacostraca	*Stereomastis nana*	L	LC	
Arthropoda	Malacostraca	*Stereomastis talismani*	L	LC	
Arthropoda	Malacostraca	*Sudanonautes africanus*	O	LC	
Arthropoda	Malacostraca	*Sudanonautes floweri*	L	LC	
Chordata	Actinopterygii	*Synodontis batesii*	L	LC	
Chordata	Actinopterygii	*Tetraodon mbu*	L	LC	
Arthropoda	Insecta	*Tetrathemis camerunensis*	L	LC	
Mollusca	Gastropoda	*Thais nodosa*	L	LC	
Chordata	Reptilia	*Thelotornis kirtlandii*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Arthropoda	Insecta	*Thermochoria equivocata*	L	LC	
Arthropoda	Insecta	*Tholymis tillarga*	L	LC	
Chordata	Reptilia	*Thrasops flavigularis*	L	LC	
Chordata	Reptilia	*Thrasops jacksonii*	L	LC	
Chordata	Actinopterygii	*Thysochromis ansorgii*	L	LC	
Chordata	Reptilia	*Toxicodryas blandingii*	L	LC	
Chordata	Reptilia	*Toxicodryas pulverulenta*	L	LC	
Chordata	Reptilia	*Trachylepis acutilabris*	L	LC	
Chordata	Reptilia	*Trachylepis affinis*	O	LC	
Chordata	Reptilia	*Trachylepis maculilabris*	L	LC	
Arthropoda	Insecta	*Tramea basilaris*	L	LC	
Chordata	Amphibia	*Trichobatrachus robustus*	L	LC	
Chordata	Reptilia	*Trioceros cristatus*	L	LC	
Chordata	Reptilia	*Trioceros oweni*	L	LC	
Chordata	Reptilia	*Trionyx triunguis*	L	VU	
Arthropoda	Insecta	*Trithemis aconita*	L	LC	
Arthropoda	Insecta	*Trithemis aenea*	L	LC	
Arthropoda	Insecta	*Trithemis annulata*	L	LC	
Arthropoda	Insecta	*Trithemis arteriosa*	L	LC	
Arthropoda	Insecta	*Trithemis dichroa*	L	LC	
Arthropoda	Insecta	*Trithemis grouti*	L	LC	
Arthropoda	Insecta	*Trithemis imitata*	L	LC	

Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Arthropoda	Insecta	*Trithemis kirbyi*	L	LC	
Arthropoda	Insecta	*Trithemis nuptialis*	L	LC	
Arthropoda	Insecta	*Trithemis pruinata*	L	LC	
Arthropoda	Insecta	*Trithemis stictica*	L	LC	
Arthropoda	Insecta	*Trithemis tropicana*	L	LC	
Chordata	Actinopterygii	*Tylochromis lateralis*	L	LC	
Mollusca	Gastropoda	*Tympanotonos fuscatus*	L	LC	
Arthropoda	Insecta	*Umma longistigma*	L	LC	
Arthropoda	Insecta	*Umma saphirina*	L	LC	
Arthropoda	Insecta	*Urothemis assignata*	L	LC	
Arthropoda	Insecta	*Urothemis edwardsii*	L	LC	
Chordata	Reptilia	*Varanus niloticus*	O	LC	
Mollusca	Gastropoda	*Vitta adansoniana*	L	LC	
Mollusca	Gastropoda	*Vitta cristata*	L	LC	
Mollusca	Gastropoda	*Vitta glabrata*	L	LC	
Mollusca	Gastropoda	*Vitta rubricata*	L	NT	
Chordata	Actinopterygii	*Xenocharax crassus*	L	LC	
Chordata	Actinopterygii	*Xenomystus nigri*	L	LC	
Chordata	Amphibia	*Xenopus allofraseri*	L	LC	
Chordata	Amphibia	*Xenopus epitropicalis*	L	LC	
Chordata	Amphibia	*Xenopus mellotropicalis*	L	LC	
Chordata	Amphibia	*Xenopus petersii*	L	LC	

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Phylum	Class	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Chordata	Amphibia	*Xenopus sp*	O	NE	
Chordata	Actinopterygii	*Yongeichthys thomasi*	L	LC	
Arthropoda	Insecta	*Zygonoides occidentis*	L	LC	
Arthropoda	Insecta	*Zygonyx flavicosta*	L	LC	
Arthropoda	Insecta	*Zygonyx regisalberti*	L	LC	
Arthropoda	Insecta	*Zygonyx torridus*	L	LC	
Arthropoda	Insecta	*Zyxomma atlanticum*	L	LC	

Table 20: Birds and Bats species list

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Accipitridae	*Accipiter badius*	L	LC	
Aves	Accipitridae	*Accipiter castanilius*	L	LC	
Aves	Accipitridae	*Accipiter melanoleucus*	L	LC	
Aves	Accipitridae	*Accipiter toussenelii*	L	LC	
Aves	Acrocephalidae	*Acrocephalus arundinaceus*	O	LC	
Aves	Acrocephalidae	*Acrocephalus rufescens*	L	LC	
Aves	Acrocephalidae	*Acrocephalus schoenobaenus*	L	LC	
Aves	Scolopacidae	*Actitis hypoleucos*	O	LC	
Aves	Jacanidae	*Actophilornis africanus*	L	LC	
Aves	Psittacidae	*Agapornis pullarius*	L	LC	
Aves	Numididae	*Agelastes niger*	L	LC	
Aves	Muscicapidae	*Agricola pallidus*	L	LC	
Aves	Alcedinidae	*Alcedo quadribrachys*	O	LC	
Aves	Muscicapidae	*Alethe castanea*	L	LC	
Aves	Anatidae	*Alopochen aegyptiaca*	L	LC	

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Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Estrildidae	*Amandava subflava*	L	LC	
Aves	Ploceidae	*Amblyospiza albifrons*	L	LC	
Aves	Nectariniidae	*Anabathmis reichenbachii*	L	LC	
Aves	Ciconiidae	*Anastomus lamelligerus*	O	LC	
Aves	Anhingidae	*Anhinga rufa*	L	LC	
Aves	Viduidae	*Anomalospiza imberbis*	O	LC	
Aves	Remizidae	*Anthoscopus flavifrons*	L	LC	
Aves	Nectariniidae	*Anthreptes aurantius*	L	LC	
Aves	Nectariniidae	*Anthreptes gabonicus*	L	LC	
Aves	Nectariniidae	*Anthreptes tephrolaemus*	L	LC	
Aves	Motacillidae	*Anthus nyassae*	L	LC	
Aves	Motacillidae	*Anthus pallidiventris*	L	LC	
Aves	Cisticolidae	*Apalis flavida*	L	LC	
Aves	Cisticolidae	*Apalis rufogularis*	L	LC	
Aves	Trogonidae	*Apaloderma narina*	L	LC	
Aves	Apodidae	*Apus affinis*	L	LC	
Aves	Apodidae	*Apus apus*	L	LC	
Aves	Apodidae	*Apus caffer*	L	LC	
Aves	Apodidae	*Apus horus*	L	LC	
Aves	Apodidae	*Apus melba*	O	LC	
Aves	Accipitridae	*Aquila africana*	L	LC	
Aves	Ardeidae	*Ardea alba*	O	LC	
Aves	Ardeidae	*Ardea brachyrhyncha*	L	LC	
Aves	Ardeidae	*Ardea cinerea*	O	LC	
Aves	Ardeidae	*Ardea goliath*	L	LC	
Aves	Ardeidae	*Ardea melanocephala*	L	LC	
Aves	Ardeidae	*Ardea purpurea*	L	LC	
Aves	Ardeidae	*Ardeola ralloides*	L	LC	

wsp

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Ardeidae	*Ardeola rufiventris*	L	LC	EN-CR
Aves	Scolopacidae	*Arenaria interpres*	L	LC	
Aves	Muscicapidae	*Artomyias fuliginosa*	L	LC	
Aves	Pycnonotidae	*Atimastillas flavigula*	L	LC	
Aves	Accipitridae	*Aviceda cuculoides*	L	LC	
Aves	Pycnonotidae	*Baeopogon clamans*	L	LC	
Aves	Pycnonotidae	*Baeopogon indicator*	L	LC	
Aves	Platysteiridae	*Batis erlangeri*	L	LC	
Aves	Platysteiridae	*Batis minulla*	L	LC	
Aves	Platysteiridae	*Batis molitor*	L	LC	
Aves	Vangidae	*Bias musicus*	L	LC	
Aves	Pycnonotidae	*Bleda syndactylus*	L	LC	
Aves	Malaconotidae	*Bocagia minuta*	L	LC	
Aves	Threskiornithidae	*Bostrychia hagedash*	O	LC	
Aves	Threskiornithidae	*Bostrychia rara*	L	LC	
Aves	Muscicapidae	*Bradornis comitatus*	L	LC	
Aves	Strigidae	*Bubo africanus*	L	LC	
Aves	Strigidae	*Bubo lacteus*	L	LC	
Aves	Strigidae	*Bubo leucostictus*	L	LC	
Aves	Strigidae	*Bubo poensis*	L	LC	
Aves	Ardeidae	*Bubulcus ibis*	O	LC	
Aves	Lybiidae	*Buccanodon duchaillui*	L	LC	
Aves	Buphagidae	*Buphagus africanus*	L	LC	
Aves	Burhinidae	*Burhinus capensis*	O	LC	
Aves	Burhinidae	*Burhinus vermiculatus*	L	LC	
Aves	Accipitridae	*Buteo auguralis*	L	LC	
Aves	Ardeidae	*Butorides striata*	L	LC	
Aves	Bucerotidae	*Bycanistes albotibialis*	O	LC	

wsp

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Bucerotidae	*Bycanistes sharpii*	L	LC	
Aves	Cisticolidae	*Calamonastes undosus*	L	LC	
Aves	Alaudidae	*Calendulauda sabota*	L	LC	
Aves	Ardeidae	*Calherodius leuconotus*	L	LC	
Aves	Scolopacidae	*Calidris alba*	O	LC	
Aves	Scolopacidae	*Calidris canutus*	L	NT	
Aves	Scolopacidae	*Calidris ferruginea*	L	NT	
Aves	Scolopacidae	*Calidris minuta*	L	LC	
Aves	Procellariidae	*Calonectris borealis*	L	LC	
Aves	Procellariidae	*Calonectris diomedea*	L	LC	
Aves	Pycnonotidae	*Calyptocichla serinus*	L	LC	
Aves	Cisticolidae	*Camaroptera brachyura*	L	LC	
Aves	Cisticolidae	*Camaroptera chloronota*	L	LC	
Aves	Cisticolidae	*Camaroptera superciliaris*	L	LC	
Aves	Campephagidae	*Campephaga petiti*	L	LC	
Aves	Campephagidae	*Campephaga quiscalina*	L	LC	
Aves	Picidae	*Campethera abingoni*	L	LC	
Aves	Picidae	*Campethera maculosa*	L	LC	
Aves	Rallidae	*Canirallus oculeus*	L	LC	
Aves	Caprimulgidae	*Caprimulgus batesi*	L	LC	
Aves	Caprimulgidae	*Caprimulgus fossii*	L	LC	
Aves	Caprimulgidae	*Caprimulgus pectoralis*	L	LC	
Aves	Hirundinidae	*Cecropis abyssinica*	O	LC	
Aves	Hirundinidae	*Cecropis semirufa*	O	LC	
Aves	Hirundinidae	*Cecropis senegalensis*	O	LC	
Aves	Cuculidae	*Centropus anselli*	L	LC	
Aves	Cuculidae	*Centropus grillii*	O	LC	
Aves	Cuculidae	*Centropus monachus*	L	LC	

wsp

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Cuculidae	*Centropus senegalensis*	L	LC	
Aves	Cuculidae	*Centropus superciliosus*	L	LC	
Aves	Bucerotidae	*Ceratogymna atrata*	L	LC	
Aves	Muscicapidae	*Cercotrichas leucophrys*	L	LC	
Aves	Alcedinidae	*Ceryle rudis*	O	LC	
Aves	Cuculidae	*Ceuthmochares aereus*	L	LC	
Aves	Nectariniidae	*Chalcomitra fuliginosa*	L	LC	
Aves	Nectariniidae	*Chalcomitra rubescens*	L	LC	
Aves	Charadriidae	*Charadrius forbesi*	L	LC	
Aves	Charadriidae	*Charadrius hiaticula*	L	LC	
Aves	Charadriidae	*Charadrius marginatus*	L	LC	
Aves	Charadriidae	*Charadrius pecuarius*	L	LC	
Aves	Charadriidae	*Charadrius tricollaris*	L	LC	
Aves	Laridae	*Chlidonias leucopterus*	L	LC	
Aves	Laridae	*Chlidonias niger*	L	LC	
Aves	Pycnonotidae	*Chlorocichla falkensteini*	L	LC	
Aves	Pycnonotidae	*Chlorocichla simplex*	L	LC	
Aves	Malaconotidae	*Chlorophoneus bocagei*	L	LC	
Aves	Malaconotidae	*Chlorophoneus sulfureopectus*	L	LC	
Aves	Cuculidae	*Chrysococcyx caprius*	L	LC	
Aves	Cuculidae	*Chrysococcyx cupreus*	L	LC	
Aves	Cuculidae	*Chrysococcyx flavigularis*	L	LC	
Aves	Cuculidae	*Chrysococcyx klaas*	L	LC	
Aves	Muscicapidae	*Cichladusa ruficauda*	O	LC	
Aves	Ciconiidae	*Ciconia abdimii*	O	LC	
Aves	Ciconiidae	*Ciconia microscelis*	O	LC	
Aves	Sturnidae	*Cinnyricinclus leucogaster*	L	LC	
Aves	Nectariniidae	*Cinnyris batesi*	L	LC	

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Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Nectariniidae	*Cinnyris bifasciatus*	O	LC	
Aves	Nectariniidae	*Cinnyris bouvieri*	L	LC	
Aves	Nectariniidae	*Cinnyris chloropygius*	L	LC	
Aves	Nectariniidae	*Cinnyris cupreus*	L	LC	
Aves	Nectariniidae	*Cinnyris superbus*	L	LC	
Aves	Nectariniidae	*Cinnyris venustus*	O	LC	
Aves	Accipitridae	*Circaetus cinerascens*	O	LC	
Aves	Accipitridae	*Circaetus pectoralis*	L	LC	
Aves	Cisticolidae	*Cisticola anonymus*	L	LC	
Aves	Cisticolidae	*Cisticola brachypterus*	L	LC	
Aves	Cisticolidae	*Cisticola bulliens*	L	LC	
Aves	Cisticolidae	*Cisticola erythrops*	L	LC	
Aves	Cisticolidae	*Cisticola juncidis*	O	LC	
Aves	Cisticolidae	*Cisticola lateralis*	L	LC	
Aves	Cisticolidae	*Cisticola marginatus*	L	LC	
Aves	Cisticolidae	*Cisticola natalensis*	O	LC	
Aves	Cisticolidae	*Cisticola rufilatus*	O	LC	VU
Aves	Cuculidae	*Clamator jacobinus*	L	LC	
Aves	Cuculidae	*Clamator levaillantii*	L	LC	
Aves	Estrildidae	*Clytospiza monteiri*	L	LC	
Aves	Coliidae	*Colius castanotus*	O	LC	VU
Aves	Coliidae	*Colius striatus*	O	LC	
Aves	Columbidae	*Columba iriditorques*	L	LC	
Aves	Columbidae	*Columba unicincta*	L	LC	
Aves	Corvidae	*Corvus albus*	O	LC	
Aves	Musophagidae	*Corythaeola cristata*	L	LC	
Aves	Alcedinidae	*Corythornis cristatus*	L	LC	
Aves	Alcedinidae	*Corythornis leucogaster*	O	LC	

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Muscicapidae	*Cossypha niveicapilla*	L	LC	
Aves	Phasianidae	*Coturnix delegorguei*	L	LC	
Aves	Rallidae	*Crecopsis egregia*	O	LC	
Aves	Rallidae	*Crex egregia*	L	LC	
Aves	Pycnonotidae	*Criniger calurus*	L	LC	
Aves	Pycnonotidae	*Criniger chloronotus*	L	LC	
Aves	Pycnonotidae	*Criniger ndussumensis*	L	LC	
Aves	Fringillidae	*Crithagra capistrata*	L	LC	
Aves	Fringillidae	*Crithagra mozambica*	L	LC	
Aves	Cuculidae	*Cuculus canorus*	L	LC	
Aves	Cuculidae	*Cuculus clamosus*	L	LC	
Aves	Cuculidae	*Cuculus solitarius*	L	LC	
Aves	Glareolidae	*Cursorius temminckii*	L	LC	
Aves	Campephagidae	*Cyanograucalus azureus*	L	LC	
Aves	Nectariniidae	*Cyanomitra cyanolaema*	L	LC	
Aves	Nectariniidae	*Cyanomitra olivacea*	L	LC	
Aves	Nectariniidae	*Cyanomitra verticalis*	L	LC	
Aves	Apodidae	*Cypsiurus parvus*	L	LC	
Aves	Nectariniidae	*Deleornis fraseri*	L	LC	
Aves	Hirundinidae	*Delichon urbicum*	L	LC	
Aves	Anatidae	*Dendrocygna bicolor*	L	LC	
Aves	Anatidae	*Dendrocygna viduata*	L	LC	
Aves	Picidae	*Dendropicos elliotii*	L	LC	
Aves	Picidae	*Dendropicos fuscescens*	L	LC	
Aves	Picidae	*Dendropicos xantholophus*	L	LC	
Aves	Dicruridae	*Dicrurus adsimilis*	O	LC	
Aves	Dicruridae	*Dicrurus ludwigii*	O	LC	
Aves	Dicruridae	*Dicrurus modestus*	L	LC	

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Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Malaconotidae	*Dryoscopus angolensis*	L	LC	
Aves	Malaconotidae	*Dryoscopus gambensis*	L	LC	
Aves	Malaconotidae	*Dryoscopus sabini*	L	LC	
Aves	Malaconotidae	*Dryoscopus senegalensis*	L	LC	
Aves	Accipitridae	*Dryotriorchis spectabilis*	L	LC	
Aves	Platysteiridae	*Dyaphorophyia castanea*	L	LC	
Aves	Ardeidae	*Egretta garzetta*	O	LC	
Aves	Elanidae	*Elanus caeruleus*	O	LC	
Aves	Stenostiridae	*Elminia longicauda*	L	LC	
Aves	Emberizidae	*Emberiza tahapisi*	L	LC	
Aves	Ciconiidae	*Ephippiorhynchus senegalensis*	L	LC	
Aves	Cisticolidae	*Eremomela badiceps*	L	LC	
Aves	Alaudidae	*Eremopterix verticalis*	L	LC	
Aves	Scotocercidae	*Erythrocercus mccallii*	L	LC	
Aves	Estrildidae	*Estrilda astrild*	O	LC	
Aves	Estrildidae	*Estrilda atricapilla*	L	LC	
Aves	Estrildidae	*Estrilda melpoda*	O	LC	
Aves	Estrildidae	*Estrilda perreini*	L	LC	
Aves	Ploceidae	*Euplectes albonotatus*	O	LC	
Aves	Ploceidae	*Euplectes hartlaubi*	L	LC	
Aves	Ploceidae	*Euplectes hordeaceus*	O	LC	
Aves	Ploceidae	*Euplectes macroura*	O	LC	
Aves	Pycnonotidae	*Eurillas ansorgei*	L	LC	
Aves	Pycnonotidae	*Eurillas curvirostris*	O	LC	
Aves	Pycnonotidae	*Eurillas gracilis*	L	LC	
Aves	Pycnonotidae	*Eurillas latirostris*	L	LC	
Aves	Pycnonotidae	*Eurillas virens*	L	LC	
Aves	Coraciidae	*Eurystomus glaucurus*	L	LC	

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Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Coraciidae	*Eurystomus gularis*	O	LC	
Aves	Falconidae	*Falco biarmicus*	L	LC	
Aves	Falconidae	*Falco cuvierii*	O	LC	
Aves	Falconidae	*Falco naumanni*	L	LC	
Aves	Falconidae	*Falco peregrinus*	L	LC	
Aves	Falconidae	*Falco tinnunculus*	L	LC	
Aves	Muscicapidae	*Ficedula hypoleuca*	L	LC	
Aves	Muscicapidae	*Fraseria caerulescens*	L	LC	
Aves	Muscicapidae	*Fraseria cinerascens*	L	LC	
Aves	Muscicapidae	*Fraseria ocreata*	L	LC	
Aves	Muscicapidae	*Fraseria olivascens*	L	LC	
Aves	Muscicapidae	*Fraseria plumbea*	L	LC	
Aves	Scolopacidae	*Gallinago media*	L	NT	
Aves	Glareolidae	*Glareola cinerea*	L	LC	
Aves	Glareolidae	*Glareola nuchalis*	L	LC	
Aves	Glareolidae	*Glareola pratincola*	L	LC	
Aves	Numididae	*Guttera plumifera*	O	LC	
Aves	Lybiidae	*Gymnobucco calvus*	L	LC	
Aves	Lybiidae	*Gymnobucco peli*	L	LC	
Aves	Accipitridae	*Gypohierax angolensis*	O	LC	
Aves	Alcedinidae	*Halcyon albiventris*	L	LC	
Aves	Alcedinidae	*Halcyon badia*	L	LC	
Aves	Alcedinidae	*Halcyon chelicuti*	L	LC	
Aves	Alcedinidae	*Halcyon leucocephala*	L	LC	
Aves	Alcedinidae	*Halcyon malimbica*	O	LC	
Aves	Alcedinidae	*Halcyon senegalensis*	O	LC	
Aves	Accipitridae	*Haliaeetus vocifer*	L	LC	
Aves	Nectariniidae	*Hedydipna collaris*	L	LC	

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Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Accipitridae	*Hieraaetus ayresii*	L	LC	
Aves	Recurvirostridae	*Himantopus himantopus*	L	LC	
Aves	Rallidae	*Himantornis haematopus*	L	LC	
Aves	Acrocephalidae	*Hippolais icterina*	L	LC	
Aves	Hirundinidae	*Hirundo angolensis*	L	LC	
Aves	Hirundinidae	*Hirundo lucida*	L	LC	
Aves	Hirundinidae	*Hirundo nigrita*	L	LC	
Aves	Hirundinidae	*Hirundo rustica*	O	LC	
Aves	Hirundinidae	*Hirundo smithii*	L	LC	
Aves	Bucerotidae	*Horizocerus cassini*	L	LC	
Aves	Bucerotidae	*Horizocerus granti*	L	LC	
Aves	Laridae	*Hydroprogne caspia*	L	LC	
Aves	Scotocercidae	*Hylia prasina*	L	LC	
Aves	Sturnidae	*Hylopsar purpureiceps*	L	LC	
Aves	Acrocephalidae	*Iduna natalensis*	O	LC	
Aves	Pellorneidae	*Illadopsis fulvescens*	L	LC	
Aves	Indicatoridae	*Indicator exilis*	L	LC	
Aves	Indicatoridae	*Indicator indicator*	O	LC	
Aves	Indicatoridae	*Indicator maculatus*	L	LC	
Aves	Alcedinidae	*Ispidina lecontei*	L	LC	
Aves	Alcedinidae	*Ispidina picta*	L	LC	
Aves	Ardeidae	*Ixobrychus minutus*	L	LC	
Aves	Ardeidae	*Ixobrychus sturmii*	L	LC	
Aves	Pycnonotidae	*Ixonotus guttatus*	L	LC	
Aves	Picidae	*Jynx ruficollis*	L	LC	
Aves	Accipitridae	*Kaupifalco monogrammicus*	L	LC	
Aves	Estrildidae	*Lagonosticta rhodopareia*	L	LC	
Aves	Estrildidae	*Lagonosticta rubricata*	O	LC	

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Sturnidae	*Lamprotornis splendidus*	L	LC	
Aves	Malaconotidae	*Laniarius bicolor*	O	LC	
Aves	Malaconotidae	*Laniarius leucorhynchus*	L	LC	
Aves	Malaconotidae	*Laniarius luehderi*	L	LC	
Aves	Laniidae	*Lanius collaris*	O	LC	
Aves	Laniidae	*Lanius collurio*	L	LC	
Aves	Laniidae	*Lanius mackinnoni*	L	LC	
Aves	Laridae	*Larus cirrocephalus*	L	LC	
Aves	Ciconiidae	*Leptoptilos crumenifer*	L	LC	
Aves	Scolopacidae	*Limosa lapponica*	L	NT	
Aves	Otididae	*Lissotis melanogaster*	L	LC	
Aves	Accipitridae	*Lophaetus occipitalis*	L	LC	
Aves	Bucerotidae	*Lophoceros alboterminatus*	L	LC	
Aves	Bucerotidae	*Lophoceros camurus*	L	LC	
Aves	Bucerotidae	*Lophoceros fasciatus*	O	LC	
Aves	Accipitridae	*Macheiramphus alcinus*	L	LC	
Aves	Motacillidae	*Macronyx croceus*	L	LC	
Aves	Macrosphenidae	*Macrosphenus flavicans*	L	LC	
Aves	Ploceidae	*Malimbus malimbicus*	L	LC	
Aves	Ploceidae	*Malimbus nitens*	L	LC	
Aves	Ploceidae	*Malimbus rubricollis*	L	LC	
Aves	Estrildidae	*Mandingoa nitidula*	L	LC	
Aves	Vangidae	*Megabyas flammulatus*	L	LC	
Aves	Alcedinidae	*Megaceryle maxima*	L	LC	
Aves	Paridae	*Melaniparus leucomelas*	L	LC	
Aves	Indicatoridae	*Melichneutes robustus*	L	LC	
Aves	Macrosphenidae	*Melocichla mentalis*	L	LC	
Aves	Meropidae	*Merops albicollis*	L	LC	

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Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Meropidae	*Merops breweri*	O	LC	
Aves	Meropidae	*Merops bullockoides*	O	LC	
Aves	Meropidae	*Merops gularis*	O	LC	
Aves	Meropidae	*Merops malimbicus*	L	LC	
Aves	Meropidae	*Merops persicus*	L	LC	
Aves	Meropidae	*Merops pusillus*	O	LC	
Aves	Meropidae	*Merops variegatus*	O	LC	
Aves	Phalacrocoracidae	*Microcarbo africanus*	O	LC	
Aves	Accipitridae	*Micronisus gabar*	L	LC	
Aves	Accipitridae	*Milvus aegyptius*	L	LC	
Aves	Accipitridae	*Milvus migrans*	L	LC	
Aves	Alaudidae	*Mirafra rufocinnamomea*	L	LC	
Aves	Sulidae	*Morus capensis*	L	EN	
Aves	Motacillidae	*Motacilla aguimp*	L	LC	
Aves	Motacillidae	*Motacilla flava*	L	LC	
Aves	Muscicapidae	*Muscicapa cassini*	L	LC	
Aves	Muscicapidae	*Muscicapa epulata*	L	LC	
Aves	Muscicapidae	*Muscicapa sethsmithi*	L	LC	
Aves	Muscicapidae	*Muscicapa striata*	L	LC	
Aves	Musophagidae	*Musophaga rossae*	L	LC	
Aves	Ciconiidae	*Mycteria ibis*	L	LC	
Aves	Muscicapidae	*Myrmecocichla nigra*	O	LC	
Aves	Apodidae	*Neafrapus cassini*	L	LC	
Aves	Turdidae	*Neocossyphus poensis*	L	LC	
Aves	Pycnonotidae	*Neolestes torquatus*	L	LC	
Aves	Hirundinidae	*Neophedina cincta*	L	LC	
Aves	Anatidae	*Nettapus auritus*	L	LC	
Aves	Nicatoridae	*Nicator chloris*	O	LC	

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Nicatoridae	*Nicator vireo*	L	LC	
Aves	Estrildidae	*Nigrita bicolor*	L	LC	
Aves	Estrildidae	*Nigrita canicapillus*	L	LC	
Aves	Estrildidae	*Nigrita fusconotus*	L	LC	
Aves	Estrildidae	*Nigrita luteifrons*	L	LC	
Aves	Scolopacidae	*Numenius arquata*	L	NT	
Aves	Scolopacidae	*Numenius phaeopus*	L	LC	
Aves	Numididae	*Numida meleagris*	O	LC	
Aves	Ardeidae	*Nycticorax nycticorax*	L	LC	
Aves	Oceanitidae	*Oceanites oceanicus*	L	LC	
Aves	Columbidae	*Oena capensis*	L	LC	
Aves	Muscicapidae	*Oenanthe familiaris*	L	LC	
Aves	Sturnidae	*Onychognathus fulgidus*	L	LC	
Aves	Laridae	*Onychoprion fuscatus*	L	LC	
Aves	Oriolidae	*Oriolus brachyrynchus*	L	LC	
Aves	Oriolidae	*Oriolus nigripennis*	L	LC	
Aves	Pandionidae	*Pandion haliaetus*	O	LC	
Aves	Picidae	*Pardipicus caroli*	L	LC	
Aves	Picidae	*Pardipicus nivosus*	L	LC	
Aves	Estrildidae	*Parmoptila woodhousei*	L	LC	
Aves	Passeridae	*Passer domesticus*	O	LC	
Aves	Passeridae	*Passer griseus*	O	LC	
Aves	Pelecanidae	*Pelecanus onocrotalus*	L	LC	
Aves	Phasianidae	*Peliperdix lathami*	L	LC	
Aves	Accipitridae	*Pernis apivorus*	L	LC	
Aves	Hirundinidae	*Petrochelidon rufigula*	L	LC	
Aves	Phaethontidae	*Phaethon aethereus*	L	LC	
Aves	Phalacrocoracidae	*Phalacrocorax capensis*	L	EN	

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Phalacrocoracidae	*Phalacrocorax carbo lucidus*	O	LC	
Aves	Phoenicopteridae	*Phoenicopterus roseus*	L	LC	
Aves	Scotocercidae	*Pholidornis rushiae*	L	LC	
Aves	Pycnonotidae	*Phyllastrephus albigularis*	L	LC	
Aves	Pycnonotidae	*Phyllastrephus fulviventris*	L	LC	
Aves	Pycnonotidae	*Phyllastrephus icterinus*	L	LC	
Aves	Phylloscopidae	*Phylloscopus trochilus*	L	LC	
Aves	Pittidae	*Pitta angolensis*	L	LC	
Aves	Platysteiridae	*Platysteira albifrons*	L	NT	VU
Aves	Platysteiridae	*Platysteira cyanea*	L	LC	
Aves	Anatidae	*Plectropterus gambensis*	L	LC	
Aves	Threskiornithidae	*Plegadis falcinellus*	L	LC	
Aves	Ploceidae	*Ploceus aurantius*	O	LC	
Aves	Ploceidae	*Ploceus cucullatus*	O	LC	
Aves	Ploceidae	*Ploceus nigerrimus*	L	LC	
Aves	Ploceidae	*Ploceus nigricollis*	L	LC	
Aves	Ploceidae	*Ploceus ocularis*	O	LC	
Aves	Ploceidae	*Ploceus pelzelni*	O	LC	
Aves	Ploceidae	*Ploceus subpersonatus*	L	VU	
Aves	Ploceidae	*Ploceus superciliosus*	L	LC	
Aves	Ploceidae	*Ploceus tricolor*	L	LC	
Aves	Ploceidae	*Ploceus xanthops*	L	LC	
Aves	Charadriidae	*Pluvialis squatarola*	L	LC	
Aves	Heliornithidae	*Podica senegalensis*	O	LC	
Aves	Sturnidae	*Poeoptera lugubris*	L	LC	
Aves	Lybiidae	*Pogoniulus atroflavus*	L	LC	
Aves	Lybiidae	*Pogoniulus bilineatus*	L	LC	
Aves	Lybiidae	*Pogoniulus scolopaceus*	L	LC	

wsp

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Lybiidae	*Pogoniulus subsulphureus*	L	LC	
Aves	Lybiidae	*Pogonornis bidentatus*	L	LC	
Aves	Lybiidae	*Pogonornis minor*	L	LC	
Aves	Psittacidae	*Poicephalus gulielmi*	L	LC	
Aves	Accipitridae	*Polyboroides typus*	O	LC	
Aves	Rallidae	*Porphyrio alleni*	L	LC	
Aves	Cisticolidae	*Prinia bairdii*	L	LC	
Aves	Cisticolidae	*Prinia subflava*	L	LC	
Aves	Vangidae	*Prionops rufiventris*	L	LC	
Aves	Indicatoridae	*Prodotiscus insignis*	L	LC	
Aves	Hirundinidae	*Psalidoprocne nitens*	L	LC	
Aves	Hirundinidae	*Psalidoprocne pristoptera*	L	LC	
Aves	Hirundinidae	*Pseudhirundo griseopyga*	L	LC	
Aves	Hirundinidae	*Pseudochelidon eurystomina*	L	DD	
Aves	Psittacidae	*Psittacus erithacus*	O	EN	EN-CR
Aves	Phasianidae	*Pternistis afer*	O	LC	
Aves	Phasianidae	*Pternistis squamatus*	O	LC	
Aves	Anatidae	*Pteronetta hartlaubii*	L	LC	
Aves	Strigidae	*Ptilopsis granti*	L	LC	
Aves	Pycnonotidae	*Pycnonotus barbatus*	O	LC	
Aves	Estrildidae	*Pyrenestes ostrinus*	L	LC	
Aves	Pycnonotidae	*Pyrrhurus scandens*	L	LC	
Aves	Estrildidae	*Pytilia afra*	O	LC	
Aves	Estrildidae	*Pytilia melba*	O	LC	
Aves	Ploceidae	*Quelea erythrops*	L	LC	
Aves	Ploceidae	*Quelea quelea*	L	LC	
Aves	Apodidae	*Rhaphidura sabini*	L	LC	
Aves	Hirundinidae	*Riparia congica*	L	LC	

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Rostratulidae	*Rostratula benghalensis*	L	LC	
Aves	Laridae	*Rynchops flavirostris*	L	LC	
Aves	Anatidae	*Sarkidiornis melanotos*	L	LC	
Aves	Rallidae	*Sarothrura pulchra*	L	LC	
Aves	Cisticolidae	*Schistolais leucopogon*	L	LC	
Aves	Scopidae	*Scopus umbretta*	L	LC	
Aves	Strigidae	*Scotopelia bouvieri*	L	LC	
Aves	Strigidae	*Scotopelia peli*	L	LC	
Aves	Calyptomenidae	*Smithornis rufolateralis*	L	LC	
Aves	Estrildidae	*Spermestes bicolor*	L	LC	
Aves	Estrildidae	*Spermestes cucullata*	O	LC	
Aves	Estrildidae	*Spermophaga haematina*	L	LC	
Aves	Pycnonotidae	*Stelgidillas gracilirostris*	L	LC	
Aves	Accipitridae	*Stephanoaetus coronatus*	L	NT	
Aves	Stercorariidae	*Stercorarius parasiticus*	L	LC	
Aves	Laridae	*Sterna hirundo*	L	LC	
Aves	Laridae	*Sternula albifrons*	L	LC	
Aves	Laridae	*Sternula balaenarum*	L	LC	
Aves	Turdidae	*Stizorhina fraseri*	L	LC	
Aves	Columbidae	*Streptopelia capicola*	O	LC	
Aves	Columbidae	*Streptopelia semitorquata*	O	LC	
Aves	Strigidae	*Strix woodfordii*	L	LC	
Aves	Sylviidae	*Sylvia borin*	L	LC	
Aves	Macrosphenidae	*Sylvietta denti*	L	LC	
Aves	Macrosphenidae	*Sylvietta ruficapilla*	L	LC	
Aves	Macrosphenidae	*Sylvietta virens*	L	LC	
Aves	Phasianidae	*Synoicus adansonii*	L	LC	
Aves	Podicipedidae	*Tachybaptus ruficollis*	O	LC	

wsp

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Musophagidae	*Tauraco macrorhynchus*	O	LC	
Aves	Musophagidae	*Tauraco persa*	L	LC	
Aves	Malaconotidae	*Tchagra australis*	L	LC	
Aves	Malaconotidae	*Tchagra senegalus*	L	LC	
Aves	Apodidae	*Telacanthura ussheri*	L	LC	
Aves	Malaconotidae	*Telophorus viridis*	L	LC	
Aves	Accipitridae	*Terathopius ecaudatus*	L	EN	
Aves	Monarchidae	*Terpsiphone rufiventer*	L	LC	
Aves	Monarchidae	*Terpsiphone rufocinerea*	L	LC	
Aves	Monarchidae	*Terpsiphone viridis*	L	LC	
Aves	Diomedeidae	*Thalassarche chlororhynchos*	L	EN	
Aves	Laridae	*Thalasseus maximus*	L	LC	
Aves	Laridae	*Thalasseus sandvicensis*	L	LC	
Aves	Anatidae	*Thalassornis leuconotus*	L	LC	
Aves	Pycnonotidae	*Thescelocichla leucopleura*	L	LC	
Aves	Threskiornithidae	*Threskiornis aethiopicus*	O	LC	
Aves	Ardeidae	*Tigriornis leucolopha*	L	LC	
Aves	Lybiidae	*Trachylaemus purpuratus*	L	LC	
Aves	Columbidae	*Treron calvus*	L	LC	
Aves	Lybiidae	*Tricholaema hirsuta*	L	LC	
Aves	Scolopacidae	*Tringa glareola*	L	LC	
Aves	Scolopacidae	*Tringa nebularia*	L	LC	
Aves	Scolopacidae	*Tringa ochropus*	L	LC	
Aves	Scolopacidae	*Tringa stagnatilis*	O	LC	
Aves	Scolopacidae	*Tringa totanus*	L	LC	
Aves	Monarchidae	*Trochocercus nitens*	L	LC	
Aves	Leiotrichidae	*Turdoides jardineii*	L	LC	
Aves	Turdidae	*Turdus pelios*	O	LC	

WSP

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Aves	Turnicidae	*Turnix nanus*	L	LC	
Aves	Turnicidae	*Turnix sylvaticus*	L	LC	
Aves	Columbidae	*Turtur afer*	O	LC	
Aves	Columbidae	*Turtur brehmeri*	L	LC	
Aves	Columbidae	*Turtur chalcospilos*	L	LC	
Aves	Columbidae	*Turtur tympanistria*	L	LC	
Aves	Tytonidae	*Tyto alba*	L	LC	
Aves	Upupidae	*Upupa africana*	O	NE	
Aves	Upupidae	*Upupa epops*	O	LC	
Aves	Estrildidae	*Uraeginthus angolensis*	O	LC	
Aves	Coliidae	*Urocolius indicus*	O	LC	
Aves	Accipitridae	*Urotriorchis macrourus*	L	LC	
Aves	Charadriidae	*Vanellus albiceps*	L	LC	
Aves	Charadriidae	*Vanellus lugubris*	O	LC	
Aves	Viduidae	*Vidua funerea*	L	LC	
Aves	Viduidae	*Vidua macroura*	O	LC	
Aves	Laridae	*Xema sabini*	L	LC	
Aves	Rallidae	*Zapornia flavirostra*	L	LC	
Mammalia	Molossidae	*Chaerephon chapini*	L	LC	
Mammalia	Molossidae	*Chaerephon pumilus*	L	LC	
Mammalia	Pteropodidae	*Eidolon helvum*	L	NT	
Mammalia	Pteropodidae	*Epomophorus labiatus*	L	LC	
Mammalia	Pteropodidae	*Epomophorus wahlbergi*	O	LC	
Mammalia	Pteropodidae	*Epomops franqueti*	L	LC	
Mammalia	Vespertilionidae	*Glauconycteris argentata*	L	LC	
Mammalia	Vespertilionidae	*Glauconycteris beatrix*	L	LC	
Mammalia	Vespertilionidae	*Glauconycteris variegata*	L	LC	
Mammalia	Hipposideridae	*Hipposideros cyclops*	L	LC	

wsp

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mammalia	Pteropodidae	*Hypsignathus monstrosus*	L	LC	
Mammalia	Pteropodidae	*Lissonycteris angolensis*	L	LC	
Mammalia	Pteropodidae	*Megaloglossus woermanni*	L	LC	
Mammalia	Pteropodidae	*Micropteropus intermedius*	L	DD	
Mammalia	Pteropodidae	*Micropteropus pusillus*	L	LC	
Mammalia	Vespertilionidae	*Mimetillus moloneyi*	L	LC	
Mammalia	Pteropodidae	*Myonycteris torquata*	L	LC	
Mammalia	Vespertilionidae	*Myotis bocagii*	L	LC	
Mammalia	Vespertilionidae	*Neoromicia capensis*	L	LC	
Mammalia	Vespertilionidae	*Neoromicia nana*	L	LC	
Mammalia	Vespertilionidae	*Neoromicia tenuipinnis*	L	LC	
Mammalia	Nycteridae	*Nycteris arge*	L	LC	
Mammalia	Nycteridae	*Nycteris hispida*	L	LC	
Mammalia	Nycteridae	*Nycteris macrotis*	L	LC	
Mammalia	Nycteridae	*Nycteris nana*	L	LC	
Mammalia	Nycteridae	*Nycteris thebaica*	L	LC	
Mammalia	Vespertilionidae	*Pipistrellus crassulus*	L	LC	
Mammalia	Vespertilionidae	*Pipistrellus rueppellii*	L	LC	
Mammalia	Rhinolophidae	*Rhinolophus landeri*	O	LC	
Mammalia	Pteropodidae	*Rousettus aegyptiacus*	L	LC	
Mammalia	Pteropodidae	*Scotonycteris bergmansi*	L	LC	
Mammalia	Vespertilionidae	*Scotophilus dinganii*	L	LC	
Mammalia	Emballonuridae	*Taphozous mauritianus*	L	LC	
Mammalia	Hipposideridae	*Triaenops afer*	L	LC	

Table 21: Mammal species list (excluded order Chiroptera).

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mammalia	Felidae	*Acinonyx jubatus*	L	VU	EN-CR
Mammalia	Muridae	*Aethomys bocagei*	L	LC	
Mammalia	Anomaluridae	*Anomalurus beecrofti*	L	LC	
Mammalia	Anomaluridae	*Anomalurus derbianus*	L	LC	
Mammalia	Mustelidae	*Aonyx congicus*	L	NT	
Mammalia	Hystricidae	*Atherurus africanus*	O	LC	
Mammalia	Herpestidae	*Atilax paludinosus*	O	LC	
Mammalia	Herpestidae	*Bdeogale nigripes*	O	LC	
Mammalia	Canidae	*Canis adustus*	O	LC	VU
Mammalia	Felidae	*Caracal aurata*	L	VU	
Mammalia	Bovidae	*Cephalophus dorsalis*	L	NT	
Mammalia	Bovidae	*Cephalophus leucogaster*	L	NT	
Mammalia	Bovidae	*Cephalophus nigrifrons*	L	LC	
Mammalia	Bovidae	*Cephalophus silvicultor*	L	NT	
Mammalia	Rhinocerotidae	*Ceratotherium simum*	L	NT	
Mammalia	Cercopithecidae	*Cercopithecus cephus*	O	LC	
Mammalia	Cercopithecidae	*Cercopithecus cephus ssp. cephodes*	L	NT	
Mammalia	Cercopithecidae	*Cercopithecus neglectus*	L	LC	EN-CR
Mammalia	Cercopithecidae	*Cercopithecus nictitans*	O	NT	
Mammalia	Cercopithecidae	*Cercopithecus pogonias*	L	NT	
Mammalia	Cercopithecidae	*Cercopithecus pogonias ssp. nigripes*	L	NT	
Mammalia	Cercopithecidae	*Chlorocebus cynosuros*	O	LC	
Mammalia	Viverridae	*Civettictis civetta*	O	LC	VU
Mammalia	Nesomyidae	*Cricetomys emini*	L	LC	
Mammalia	Soricidae	*Crocidura olivieri*	L	LC	
Mammalia	Soricidae	*Crocidura turba*	L	LC	
Mammalia	Hyaenidae	*Crocuta crocuta*	L	LC	EN-CR

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mammalia	Procaviidae	*Dendrohyrax dorsalis*	L	LC	
Mammalia	Galagidae	*Euoticus elegantulus*	L	LC	
Mammalia	Felidae	*Felis lybica*	O	LC	
Mammalia	Felidae	*Felis sylvestris*	L	LC	VU
Mammalia	Sciuridae	*Funisciurus anerythrus*	L	LC	
Mammalia	Sciuridae	*Funisciurus lemniscatus*	L	LC	
Mammalia	Galagidae	*Galagoides demidoff*	L	LC	
Mammalia	Galagidae	*Galagoides demidoff ssp. demidoff*	L	LC	
Mammalia	Galagidae	*Galagoides thomasi*	L	LC	
Mammalia	Viverridae	*Genetta maculata*	O	LC	
Mammalia	Viverridae	*Genetta poensis*	L	DD	
Mammalia	Viverridae	*Genetta servalina*	L	LC	
Mammalia	Viverridae	*Genetta tigrina*	L	LC	VU
Mammalia	Muridae	*Gerbilliscus leucogaster*	L	LC	
Mammalia	Hominidae	*Gorilla gorilla*	L	CR	EN-CR
Mammalia	Herpestidae	*Herpestes ichneumon*	L	LC	
Mammalia	Herpestidae	*Herpestes naso*	L	LC	
Mammalia	Muridae	*Hybomys univittatus*	L	LC	
Mammalia	Mustelidae	*Hydrictis maculicollis*	L	NT	VU
Mammalia	Tragulidae	*Hyemoschus aquaticus*	L	LC	
Mammalia	Muridae	*Hylomyscus alleni*	L	LC	
Mammalia	Hystricidae	*Hystrix africaeaustralis*	L	LC	
Mammalia	Herpestidae	*Ichneumia albicauda*	L	LC	
Mammalia	Mustelidae	*Ictonyx striatus*	L	LC	
Mammalia	Muridae	*Lemniscomys striatus*	L	LC	
Mammalia	Felidae	*Leptailurus serval*	L	LC	VU
Mammalia	Muridae	*Lophuromys sikapusi*	L	LC	
Mammalia	Elephantidae	*Loxodonta cyclotis*	L	CR	VU

wsp

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mammalia	Muridae	*Mastomys natalensis*	O	LC	
Mammalia	Mustelidae	*Mellivora capensis*	L	LC	VU
Mammalia	Cercopithecidae	*Miopithecus ogouensis*	L	NT	
Mammalia	Herpestidae	*Mungos mungo*	L	LC	
Mammalia	Muridae	*Mus musculoides*	L	LC	
Mammalia	Muridae	*Mylomys dybowskii*	L	LC	
Mammalia	Nandiniidae	*Nandinia binotata*	O	LC	
Mammalia	Muridae	*Oenomys hypoxanthus*	L	LC	
Mammalia	Orycteropodidae	*Orycteropus afer*	L	LC	VU
Mammalia	Hominidae	*Pan troglodytes*	L	EN	EN-CR
Mammalia	Felidae	*Panthera pardus*	L	VU	VU
Mammalia	Sciuridae	*Paraxerus poensis*	L	LC	
Mammalia	Muridae	*Pelomys campanae*	L	LC	
Mammalia	Lorisidae	*Perodicticus edwardsi*	L	LC	
Mammalia	Manidae	*Phataginus tetradactyla*	L	VU	
Mammalia	Manidae	*Phataginus tricuspis*	L	EN	
Mammalia	Bovidae	*Philantomba monticola*	O	LC	
Mammalia	Viverridae	*Poiana richardsonii*	L	LC	
Mammalia	Suidae	*Potamochoerus porcus*	O	LC	
Mammalia	Tenrecidae	*Potamogale velox*	L	LC	
Mammalia	Muridae	*Praomys jacksoni*	L	LC	
Mammalia	Muridae	*Praomys petteri*	L	LC	
Mammalia	Sciuridae	*Protoxerus stangeri*	L	LC	
Mammalia	Muridae	*Rattus rattus*	L	LC	
Mammalia	Bovidae	*Redunca arundinum*	L	LC	
Mammalia	Manidae	*Smutsia gigantea*	L	EN	VU
Mammalia	Bovidae	*Sylvicapra grimmia*	L	LC	
Mammalia	Bovidae	*Syncerus caffer caffer*	L	NT	EN-CR

Class	Family	*Species binomial*	Observed (O) Literature (L)	IUCN Global Risk Category	National Red List
Mammalia	Bovidae	*Syncerus caffer nanus*	L	NE	EN-CR
Mammalia	Thryonomyidae	*Thryonomys swinderianus*	O	LC	
Mammalia	Bovidae	*Tragelaphus scriptus*	O	LC	
Mammalia	Bovidae	*Tragelaphus spekii*	O	LC	
Mammalia	Trichechidae	*Trichechus senegalensis*	L	VU	EN-CR

APPENDIX B

Habitat and Flora field survey data

FLO 01

Figure 67: Humid forest at FLO_01.

The vegetation at this sampling point is of the dense forest type, consisting of a large heterogeneity of tree and shrub elements, distributed in a variable way, with emphasis on the large number of vines that hang over the trees and shrubs. In some places it is possible to observe clearings resulting from the cutting of timber species, as well as small trails for loggers and hunters. The main species identified are: *Lannea welwitschii*, *Zanthoxylum gilletii*, *Ricinodendron heudelotii*, *Monosis conferta*, *Spondias mombin*, *Pteleopsis myrtifolia*, *Dracaena mannii*, *Oncoba welwitschii*, *Dalhousia africana*, *Hymenocardia ulmoides*, *Alchornea cordifolia*, *Cnestis corniculata*, *Dalhousiea africana*, *Cnestis ferruginea* and *Heinsia crinita*. Among the climbing plants, *Landolphia* spp., *Mondia whitei* and *Calopogonium mucunoides*, stand out. It is worth highlighting at this point the spread of *Chromolaena odorata* in clearings, one of the main invasive species in Angola that occupies places generally abandoned after human intervention.

The vegetation presents a low level of degradation, the main factors being logging and invasive species.
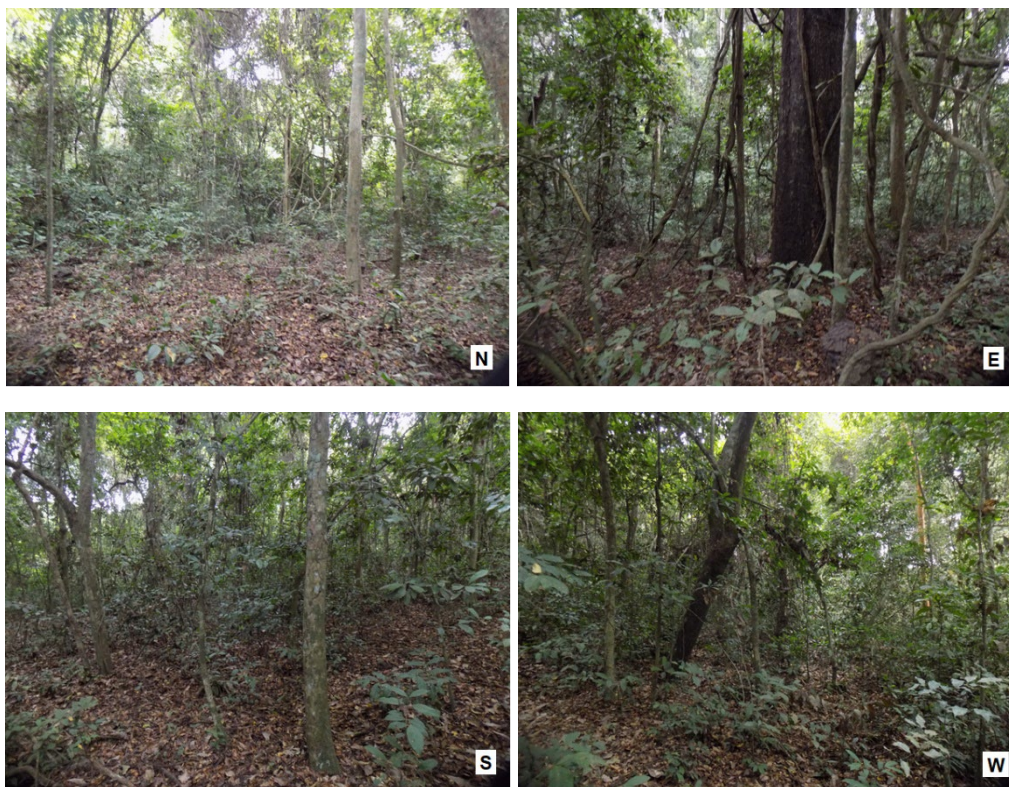
WSP

FLO 02

Figure 68: Humid Forest (Semi-deciduous) at FLO_02.

The vegetation characteristic of this point is of the semi-deciduous dense humid forest type, nestled in ravine terrain, dominated by large trees. The epiphytic layer is well developed, with a large number of vines present. The arboreal layer is made up of large trees, over 30 meters tall, among which the following stand out: *Pycnanthus angolensis*, *Musanga cecropioides*, *Anthocleita schweinfurthii*, *Piptadeniastrum africanum*, *Pteleopsis myrtifolia*, *Ricinodendron heudelotii*, *Albizia adiantifolia*, *Cola diversifolia*, *Markhamia obtusifolia*, *Oncoba welwitschii*, *Dracaena mannii* and others. The shrub layer is made up of shade-tolerant species, such as *Tabernanthe iboga*, *Dichapetalum lujae*, *Psychotria* sp., *Rourea coccinea*, *Combretum racemosum* and others. The herbaceous layer is also made up of shade species, such as *Anchomanes difformis*, *Brillantaisia owariensis* and a great diversity of ferns, mosses and mushrooms. The difficult access keeps the vegetation in a natural state, which is why it is considered to have a low level of degradation.
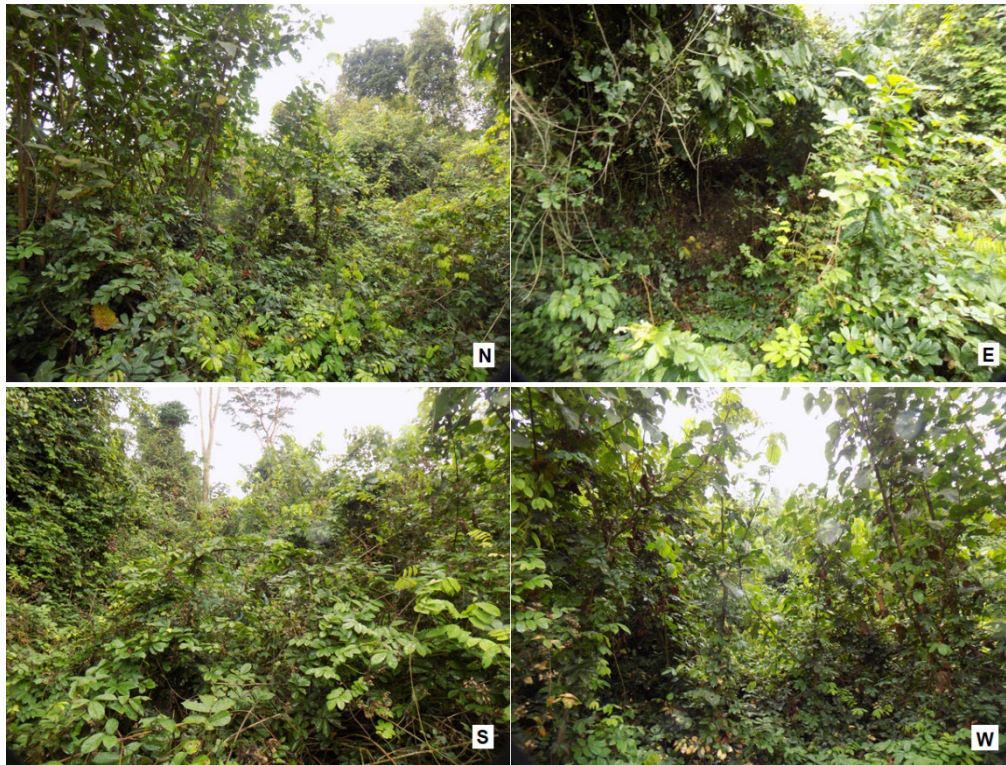
FLO 03

Figure 69: Humid Forest (Semi-deciduous) at FLO_03.

This point corresponds to the same type of habitat (forest) described for point FLO 02, with a similar structure and composition. However, this point has more clearings, probably resulting from human activity, but with a still considered low level of degradation. As a result, a large number of tree and climbing species are regenerating.
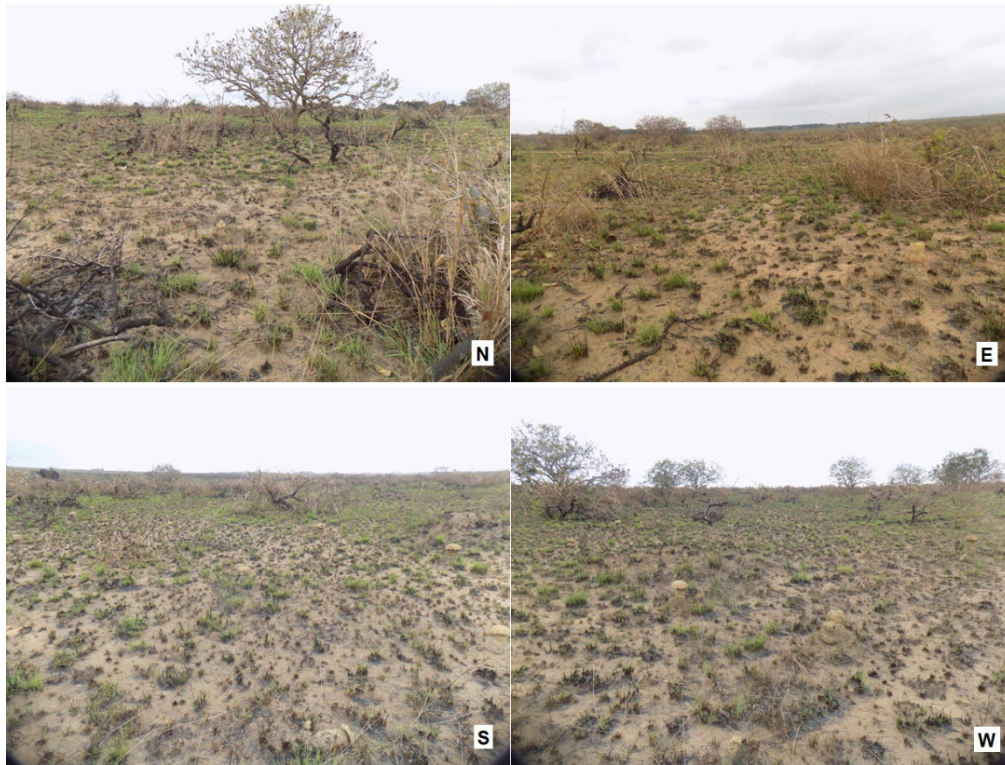
FLO 04

Figure 70: Shrubby savanna at FLO_04.

This sampling point corresponds to a shrubby savanna formation, with more or less scattered shrubs, where *Annona senegalensis*, *Bridelia michrantha* and *Psorospermum febrifugum* are dominant in the shrub stratum. The herb layer is made up of grasses of the genera *Digitaria*, *Ctenium*, *Hyparrhenia* and *Loudetia*, as well as other non-grasses such as *Indigofera paracapitata*, *Indigofera* sp. and *Uraria picta*. It is a habitat that is cyclically subjected to fires in the dry season, meaning that almost all species show some morphological or physiological adaptation to fire. It presents a medium level of anthropogenic degradation.
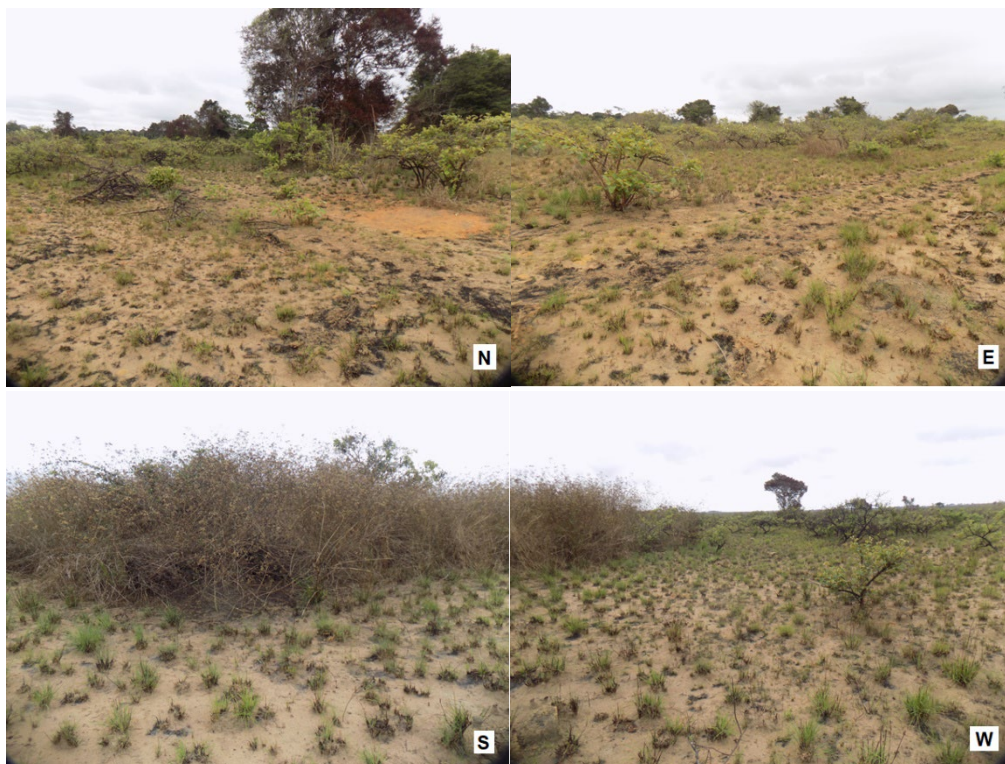
FLO 05

Figure 71: Shrubby Savanna at FLO_05.

This sampling point also corresponds to the shrubby savanna, with the particularity of being an area recently used for agriculture, now abandoned and colonized by *Chromolaena odorata*, an invasive species adapted to places with human disturbance. Another particularity at this point is the existence of some nuclei with medium-sized trees (*Hymenocardia ulmoides*), probably indicating the recent conversion of forest to savanna. It is also an area of frequent bush fires, whose characteristic species show adaptations to fire. The main shrub species are *Annona senegalensis*, *Hymenocardia ulmoides*, *Ximenia americana*, *Psorospermum febrifugum*, *Bridelia micrantha* and *Ricinodendron heudelotii*. In the herbaceous layer, in addition to grasses, other species can also be found such as *Indigofera paracapitata* and *Aspilia kotschy*. The main factor of degradation is fires, mostly of anthropogenic origin.

FLO 06
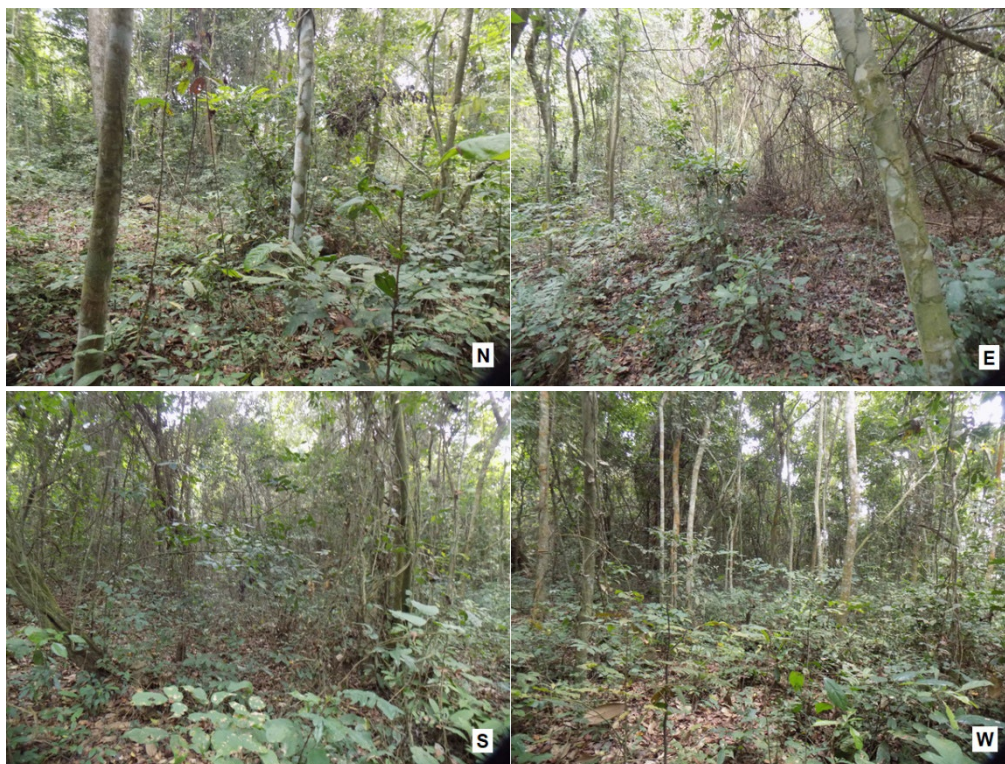
Figure 72: Humid Forest at FLO_06.

It is an area of dense primary forest with the dominant arboreal layer covering the ground with the canopy of large trees, allowing only the development of shade-tolerant shrubs. It is located on terrain with more or less irregular relief with depressions and valleys around it. Due to the difficulties of access, most of the forest is in good condition, with only traces of the movement of hunters. The main characteristic species of the forest are generally *Sterculia tragacantha*, *Pteleopsis anisoptera*, *Markhamia* sp., *Cola diversifolia*, *Cola* sp., *Zanthoxylum gilletii*, *Dracaena mannii*, *Oncoba welwitschii*, *Cnestis corniculata* and others. Large vines hang over the trees, namely *Landolphia awariensis* and *Flagellaria guinnensis*.
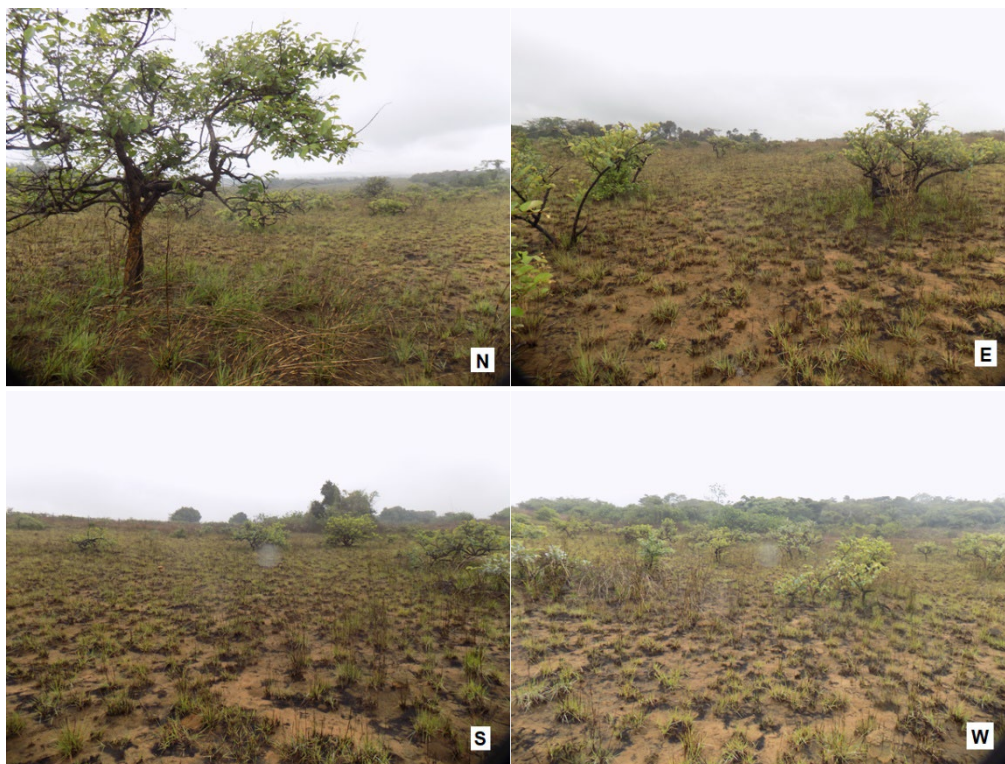
FLO 07

Figure 73: Shrubby Savanna at FLO_07.

The preliminarily defined point is located within a completely fenced private property, so the terrain study was carried out at the closest possible point, whose habitat is in continuity. It corresponds to the shrubby savannah area, on slightly sloping terrain, subject to seasonal fires. The dominant layer is shrubs, in addition to the grassy cover. The main species are generally *Annona senegalensis*, *Bridelia micrantha*, *Psorospermum febrifugum*, *Vitex madiensis*, *Heinsia crinita*. In certain places, small nuclei are formed with some trees and shrubs, such as *Albizia ferruginea*, *Ricinodendron heudelotii*, *Dracaena manni*, *Alchornia cordifolia*, *Cnestis corniculata* and *Lannea welwitschii*.

A large part of the area is invaded by *Chromolaena odorata*, one of the main invasive species in the region. Despite the evident signs of human action in the area, the level of degradation can still be considered average.
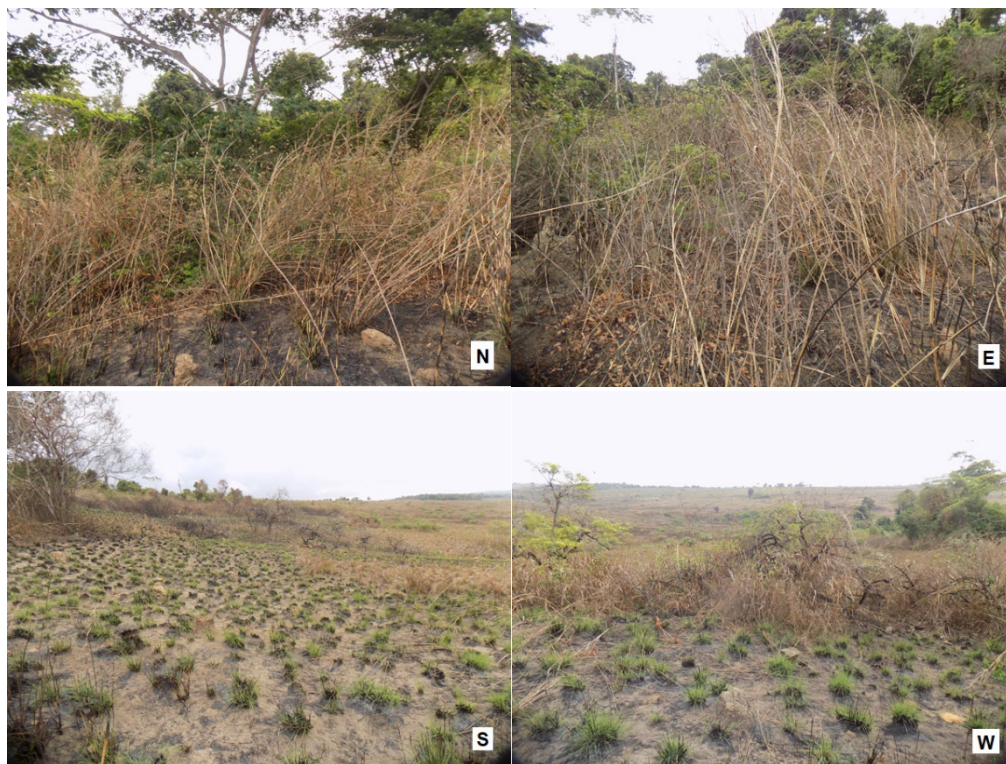
FLO 08

Figure 74: Shrubby Savanna/Forest Transition at FLO_08.

This is a savanna-forest transition area where there is an overlap between forest arboreal elements and savanna shrub elements. It shows few signs of anthropogenic alteration, so the level of degradation is considered low. In general, the natural vegetation is still very evident, despite the fires that mostly devastate the savannah part. The main tree species identified were: *Ricinodendron heudelotii*, *Pteleopsis anisoptera*, *Hymenocardia ulmoides*, *Vernonia conferta*, *Ficus* sp., *Musanga cecropioides* and others. Several species can be found in the shrub layer, such as *Oncoba welwitschii*, *Harungana madagascariensis*, *Albizia ferruginea*, *Albizia adiantifolia*, *Alchornia cordifolia*, *Cnestis corniculata*, *Psychotria* sp. As well as *Annona senegalensis*, *Trema orientalis*, *Psorospermum febrifugum* and others, in typical savanna areas. There is also a profusion of some climbing plants such as *Landolphia* sp., *Dioscorea alata*, *Dioscorea bulbifera*, *Rourea coccinea* and *Flagellaria guineensis*. Abandoned agricultural fields and other locations are colonized by *Chromolaena odorata*.

FLO 09

Figure 75: Coastal Shrubby Savanna at FLO_09.

This location corresponds to the shrub savannah zone of the coastal plain, with shrubs no more than 1.5 meters tall, sparsely distributed. It already presents a considerable level of degradation, due to preliminary works and also fires. Most plant species have adapted to counteract the harmful effects of fires. For this reason, after the fire passes, there is rapid and vigorous regeneration of the vegetation cover. The main species in the shrub layer are: *Annona senegalensis*, *Bridelia micrantha*, *Psorospermum febrifugum* and *Piliostigma thonningii*. Some species of anthropogenic origin can also be observed around the point, such as *Elaeis guineenses* (Palm trees), *Bambusa vulgaris* (Bambú), *Mangifera indica* (Mango tree) and *Murraya paniculata*, forming a cluster in the middle of the savannah. In the herbaceous layer, in addition to low-sized grasses (*Ctenium concinum*, *Digitaria* sp. and *Panicum* sp.), *Uraria picta* and *Indigofera paracapitata* are also common.
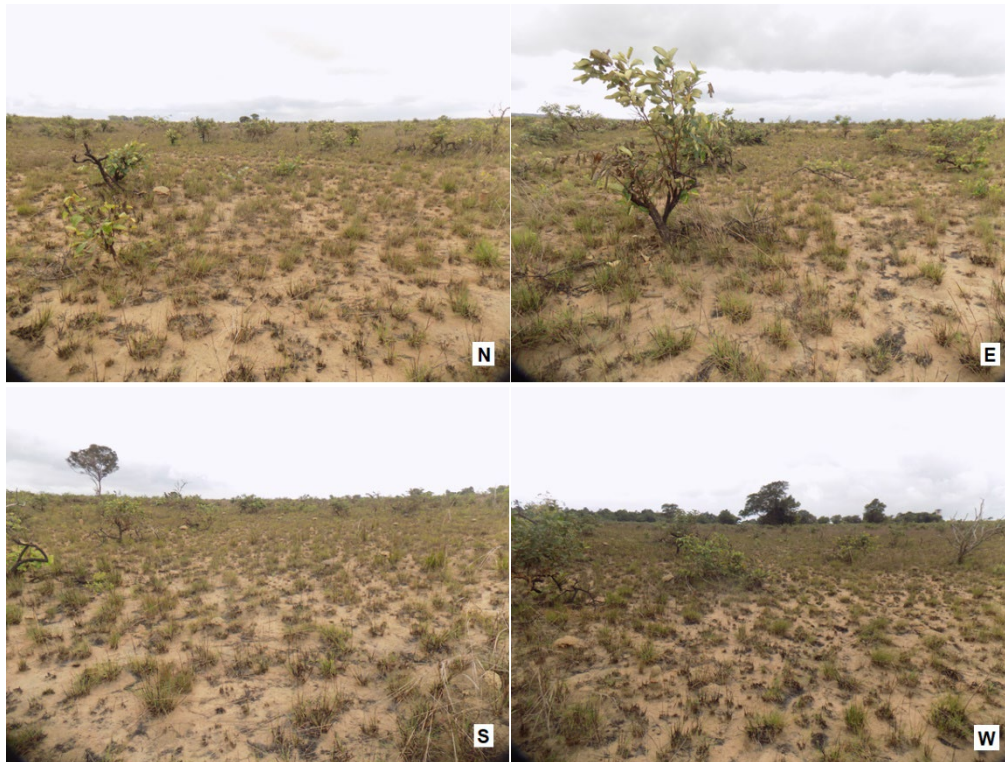
FLO 10

Figure 76: Coastal Shrubby Savanna at FLO_10.

This sampling point also corresponds to a shrubby savanna similar to the previous point, with the same structure and composition. The differences consist of the bush density, which is greater at this point, and the absence of species of anthropogenic origin.
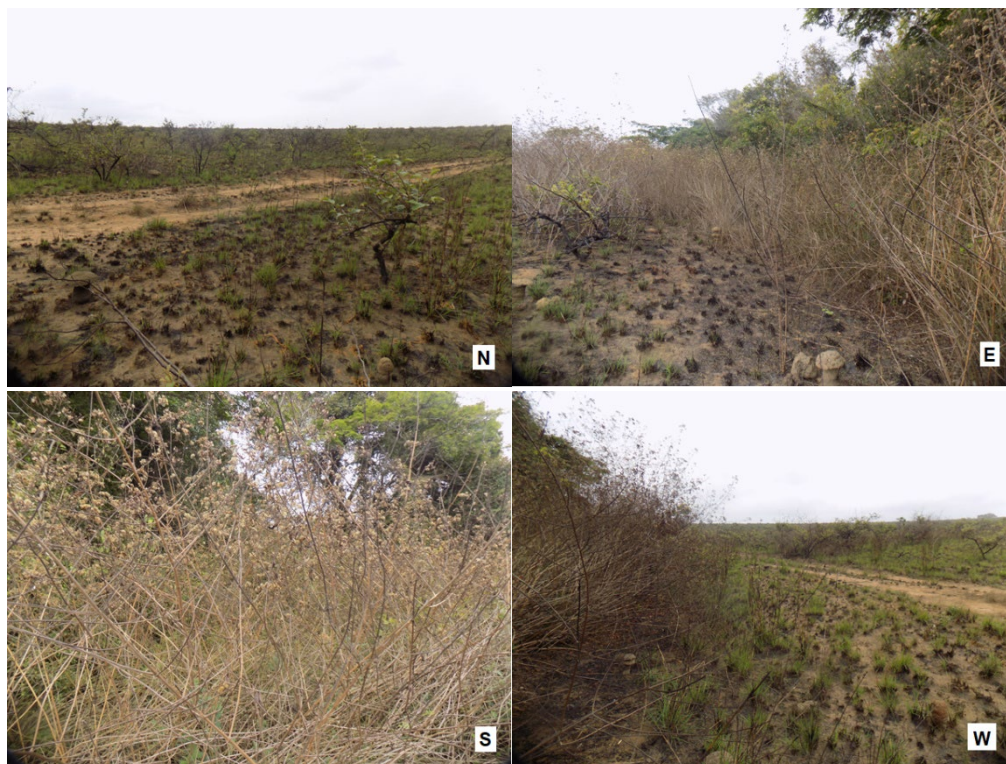
FLO 11

Figure 77: Shrubby Savanna/Forest Transition at FLO_11.

It is located in the transition zone between savannah and forest, therefore there are species from both types of habitats. There appears to be few signs of human intervention, so the level of degradation can be considered lox. A very common species in this habitat is *Hymenocardia ulmoides*. In addition to the aforementioned species, *Oncoba welwitschii*, *Trichoscypha oddonii*, *Anthocleista schweinfurthii*, *Vernonia conferta*, *Dracaena mannii*, *Ricinodendron heudelotii*, *Macaranga* sp., *Sterculia tragacantha*, *Trema guineensis*, *Albizia gummifera*, *Albizia adiantifolia*, among others, predominate in the interior of the secondary forest. Several climbing species hang over the trees, with emphasis on *Landolphia awariensis*, *Dioscorea alata*, *Flagelaria guineensis* and *Cnestis corniculata*. The shrub layer is poorly developed, except in clearings. Some of the species in this stratum are: *Tabernanthera iboga*, *Psychotria* sp. and others. The herbaceous layer is not very significant, while the soil is covered by a dead blanket where various fungi (mushrooms) and mosses develop. For the savannah area, common species are *Annona senegalensis*, *Strychnos heiningsii*, *Bridelia micrantha* and *Vitex madiensis*. Fire is one of the main factors in the degradation of savannah vegetation, although it also plays an essential role in natural regeneration. Although there are signs of human intervention and the occurrence of an invasive species (*Chromolaena odorata*), the level of degradation can be considered low.

FLO 12

Figure 78: Humid Forest (Regression) at FLO_12.

The natural habitat of this point corresponds to dense semi-deciduous humid forest, located in terrain with depressions. It is currently an area that is undergoing extensive deforestation for conversion into agricultural fields and charcoal production. In certain places there have been fields for some time, especially cassava and bananas, while in others deforestation is very recent. The area is crossed by trails and popular paths. There are traces of the use of tree trunks for the production of charcoal and wood. The specific composition is very similar to other points with forest cover. Many species are in a state of regeneration after the passage of fire. The level of forest degradation can be considered high, with the main factors of degradation being the production of charcoal, wood, conversion of the forest to agriculture, fires and invasive species.

FLO 13

Figure 79: Shrubby Savanna/Forest Transition at FLO_13.

This sampling point corresponds to a forest-savannah transition area, with evident signs of human intervention. It is a more or less flat terrain, followed by a deep ravine that coincides with the forest area. The savannah part appears to have also been forest converted into cassava and banana fields, through the slash and burn process (shifting agriculture). There are several paths and access for vehicles. The traces of natural arboreal vegetation consist of stumps and isolated trees regenerating among the cassava plants. In some abandoned sites, it is already possible to observe some fast-growing species, such as *Ricinodendron heudelotii*, *Musanga cecropioides*, *Trema guineenses*, *Albizia adiantiifolia* and *Macaranga gilletii*, indicating the regeneration phase. Due to human disturbance, some places are completely invaded by *Chromolaena odorata* and a range of other herbaceous plants that take advantage of the penetration of sunlight. The forest area is characterized by large trees, such as *Dracaena mannii*, *Oncoba welwitschii*, *Uapaca guineenses*, *Lannea welwitschii* as well as various climbing plants such as *Landolphia* sp., *Flagelaria guineenses*, *Stephania abyssinica*, *Cnestis corniculata*, *Sclerodendron splendens* and others. Depending on human activities carried out in the area, the level of degradation can be considered high and has a direct impact on the vegetation cover.

FLO 14

Figure 80: Humid Forest at FLO_14.

It is an area of dense primary forest on very irregular terrain, with the dominance of the arboreal stratum that almost completely covers the soil where only vegetation adapted to shading grows, such as ferns and mosses, as well as various fungi. A tangle of diverse vines, many of which have a woody consistency, such as *Landolphia* sp., *Dioscorea alata*, *Dioscorea bulbifera*, *Dioscorea praehensilis*, *Leptoderris fasciculata*, *Cissus aralioides* and others hang over the canopy of the large trees. Despite having a trail that allows access to the site, the human action is quite low, and it can be considered as a site with a low degree of degradation. Several species were identified in the arboreal stratum, such as *Albizia gummifera*, *Ricinodendron heudelotii*, *Pteleopsis anisoptera*, *Humenocardia ulmoides*, *Macaranga gilletii*, *Oncoba welwitschii*, *Lannea welwitschii*, *Piptadeniastrum africanum*, *Staudtia kamerunensis*, *Tricoscypha oddonii*, *Dialium pachyphyllum*, *Petersianthus macrocarpus* and *Trema guineensis*.

WSP

FLO 15

Figure 81: Shrubby Savanna at FLO_15.

This location corresponds to a savannahized area, resulting from the conversion of the forest to farming (shifting agriculture). The main crops are generally cassava and bananas, although there are others that are not very significant. It is still possible to observe the stumps and some trunks of the large trees that made up the natural forest formation, decomposing, while others are used in the production of charcoal. There are also traces of wood sawing. Even among the cassava trees, it is possible to observe some species undergoing regeneration, namely *Trema guineensis*, *Morinda morindoides*, *Turraeanthus africanus*, *Dalhousea africana*, *Albizia ferruginea*, *Sphenostylis stenocarpa*, *Hymenocardia ulmoides*, *Anthocleista schweinfurthii*, *Cnestis corniculata* and *Murraya paniculata*, the latter non-native, but which is spreading throughout the surrounding area. Another species that is widespread in places with human intervention is *Chromolaena odorata*. The presence of ravines associated with forests continues to be a constant. Given the level of human intervention at the site, the level of degradation can be considered high.
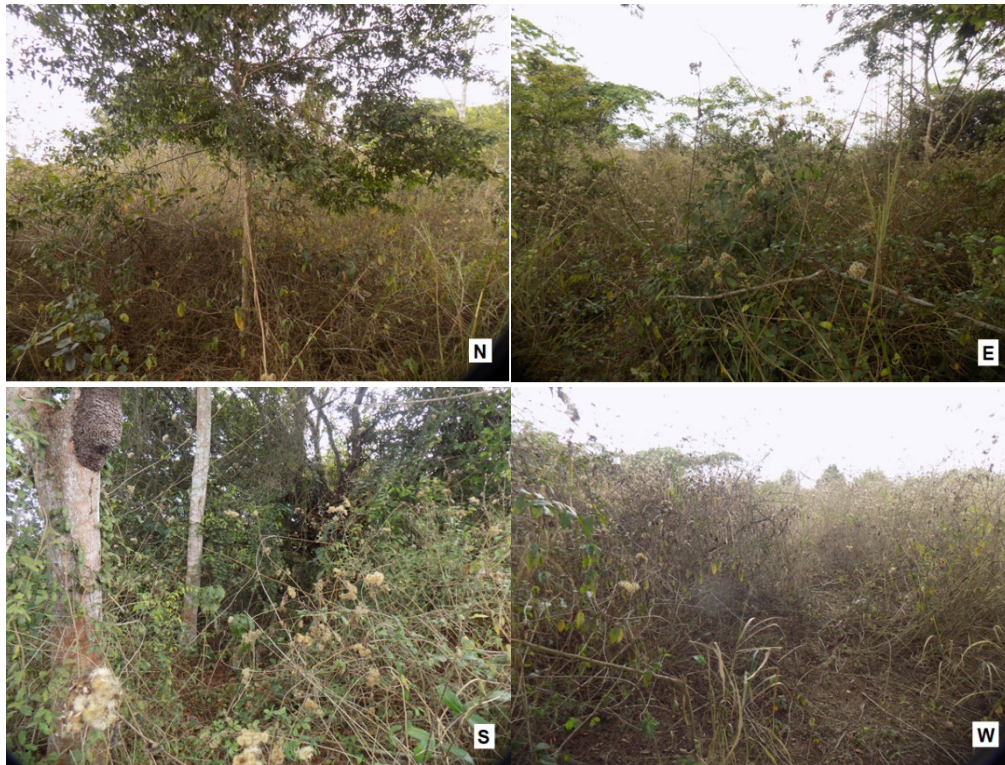
FLO 16

Figure 82: Arboreal Savanna at FLO_16.

The predefined point is located within the perimeter of the Malongo Oil Field, access to which is very limited and subject to very strict protocols. However, another point was chosen close to the Malongo field fence, whose vegetation cover is continuous with the point, which comprises savannah plots with trees and bushes and also dense centres of trees and bushes with the appearance of a small forest. With the exception of some species introduced as living fence (*Morraya paniculata*) and ornamentals, the main species identified in the adjacent savannah areas were: *Albizia gummifera*, *Annona senegalensis*, *Piliostigma thonningii*, *Ficus* sp., *Anthocleista schweinfurthii*, *Psichotria* sp., *Bridelia micrantha* and various grasses.

FLO 17

Figure 83: Arboreal Savanna at FLO_17.

Point corresponding to a heavily wooded savanna area, taking on the appearance of a dry forest. The predefined point is also located within the Malongo facilities, but given the similarity and continuity of the habitat, another point was defined to survey the vegetation. Despite being next to the national road, the degree of degradation can be considered low, apparently because it is located very close to the Malongo field. Still, fires are frequent in the area. The arboreal vegetation consists of *enruginea*, *Hymenocardia ulmoides*, *Zanthoxylum gilletii* and *Anthocleista schweinfurthii*. Among the trees there are several shrubs, namely *Annona senegalensis*, *Alchornea cordifolia*, *Psorospermum febrifugum*, *Heinsia crinita* and *Bridelia micrantha*.

FLO 18
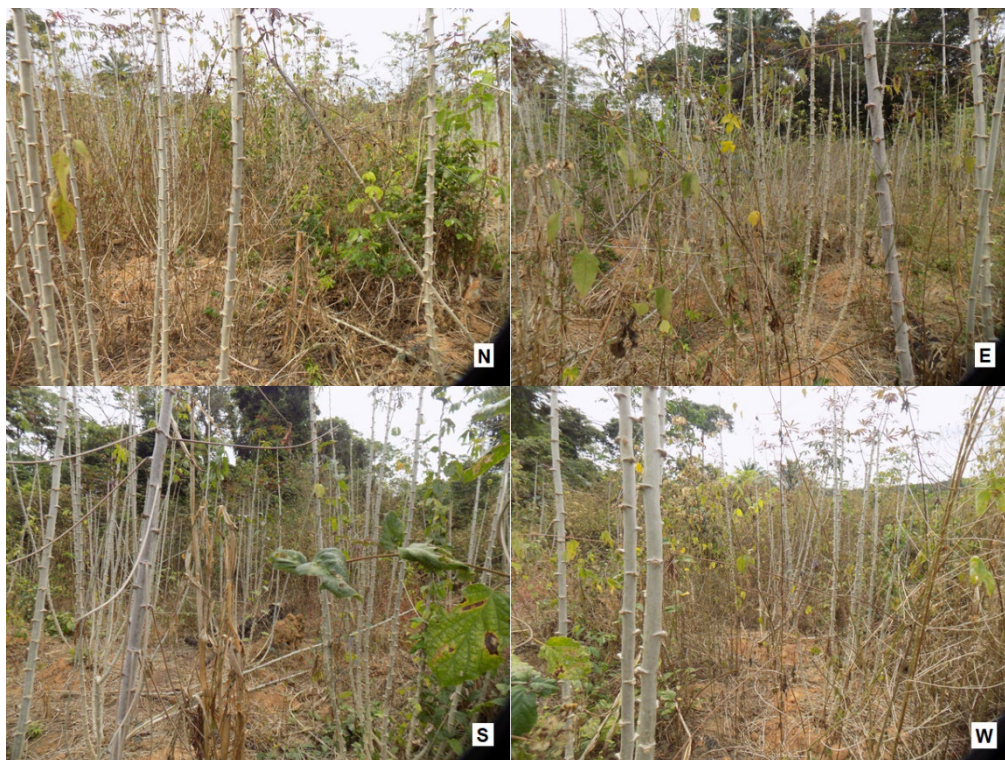
Figure 84: Degraded Forest/Cultivation fields at FLO_18.

Sampling point corresponding to an agricultural field resulting from the degradation of dense forest. Some trunks of recently felled trees, isolated trees and stumps on the ground, as well as the physiognomy of the vegetation in the surrounding areas are testimony to the natural vegetation that characterized the area. Despite the degree of degradation of the native forest, it is still possible to identify the main tree species characteristic of the habitat, such as *Ricinodendron heudelotii*, *Markhamia obtusiifolia*, *Mussanga cecropioides*, *Nauclea vanderguchtii*, *Lannea welwitschii*, *Alchornea cordifolia*, *Macaranga monandra*, as well as several climbing plants such as *Landolphia* sp., *Cleodendron splendens*, *Passiflora foetida*, *Dioscorea alata*, *Dioscorea praehensilis* and *Leptoderris fasciculata*. Currently the area has been converted into cassava and banana fields. Some oil palm trees can also be seen in some spots. As in most points located in degraded forests, the herbaceous layer of the area is almost completely dominated by *Chromolaena odorata*. Even so, the degree of degradation can be considered average, with the main factors of degradation being fires, invasive species and the gradual conversion of the forest into agricultural fields.
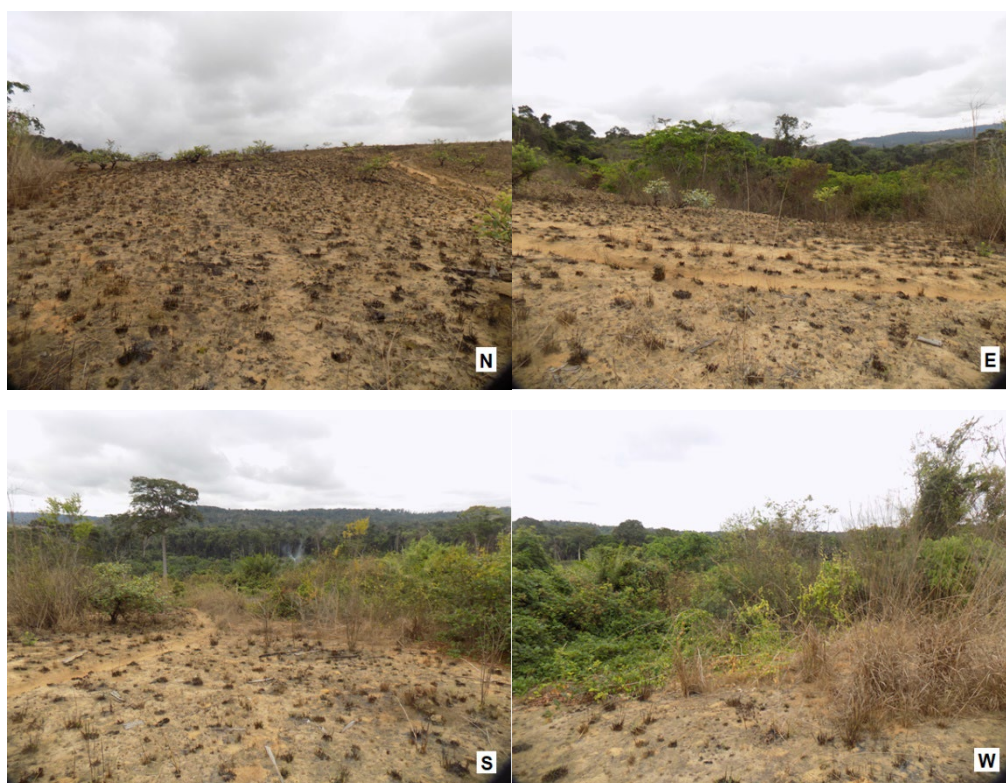
![WSP logo]

FLO 19

Figure 85: Shrubby Savanna/Forest Transition at FLO_19.

The savanna area is completely burned, with the occurrence of some fire-tolerant shrubs, such as Annona senegalensis and *Psorospermum febrifugum*. In some places less affected by fire, other tree-shrub species typical of the transition zone and beyond were identified, such as *Hymenocardia ulmoides*, *Albizia ferruginea*, *Ximenia americana*, *Dracaena mannii* and others. Part of the forest is practically converted into agricultural fields, mainly cassava and bananas, as well as other less significant crops. From the regenerating clumps it was possible to identify some species characteristic of the natural habitat, with emphasis on *Ricinodendron heudelotii*, *Musanga cecropioides*, *Funtumia africana*, *Albizia gummifera*, *Vernonia conferta*, *Anthocleista schweinfurthii*, *Cola* sp., *Oncoba welwitschii*, *Sterculia tragacantha*, *Markhamia obtusifolia*, among others. Various climbing plants such as *Landolphia* sp., *Adenia lobata*, *Dioscorea bulbifera*, *Rourea coccinea*, *Agelaea pentagyna*, *Clerodendrum splendens*, *Mucuna pruriens* and *Flagellaria guineensis*. At this point, two invasive species were also identified, namely *Chromolaena odorata*, and *Tithonia diversifolia*. The presence of *Pteridium aquilinum* was also identified, an exotic species for Angola, whose ease of local colonization and possible behavior as an invader is unknown.

The degree of habitat degradation can be considered high, considering the level of human intervention, the main factors being fires, the conversion of forest to agricultural fields and the exploitation of wood and coal production.

WSP

FLO 20



Figure 86: Shrubby Savanna at FLO_20.

The natural habitat is shrubby savanna, with more or less scattered bushes. It presents a marked level of degradation, as it is located close to a military unit and the national road. The main species identified were *Annona senegalensis*, *Bridelia micrantha*, *Piliostigma thonningii*, *Syzygium guineense*, *Clerodendron splendens*, *Trema orientalis*, *Albizia gummifera*, *Psorospermum febrifugum* and *Alchornia cordifolia*. The spread of *Chromolaena odorata* throughout the area should also be noted.

Photographic Records of the Flora Assessment

a- *Agelaea pentagyna*; b- *Ricinodendron heudelotii*; c- *Albizia gummifera*; d-*Dioscorea bulbifera*; e-*Hymenocardia ulmoides*; f- *Bambusa vulgaris*; g- *Markhamia obtusifolia*; h- *Annona senegalensis*; i- *Indigofera* sp.; j- *Bridelia micrantha*; k- *Flagellaria guineensis*; l- *Salacia* sp.; m- *Anthocleista schweinfurthii*; n- *Musanga cecropioides*; o- *Landolphia* sp.; p- *Pycnanthus angolensis*; q- *Terminalia superba*; r- *Rourea coccinea*; s-*Dioscorea* sp.; t- *Indigofera paracapitata*; u- *Maprounea africana*; v- *Oncoba welwitschii*; w- *Lannea welwitschii*; x- *Sterculia tragacantha*; y- *Anchomanes difformis*; z- *Aspilia kotschyi*; aa- *Dracaena mannii*; ab- *Alchornea cordifolia*; ac- *Cnestis corniculata*; ad- *Heinsia crinita*; ae- *Spondias mombim*; af- *Uraria picta*; ag-*Psorospermum febrifugum*; ah- *Murraya paniculata*; ai- *Cola lateritia*; aj- *Syzygium guineensis*; ak- *Ficus thonningii*; al- *Tabernanthe iboga*; am- *Macaranga* sp.; an- *Carpolobia alba*; ao- *Zanthoxylum gilletii*; ap-*Psychotria* sp.; aq- *Cogniauxia podoleana*; ar- *Chromolaena odorata*.
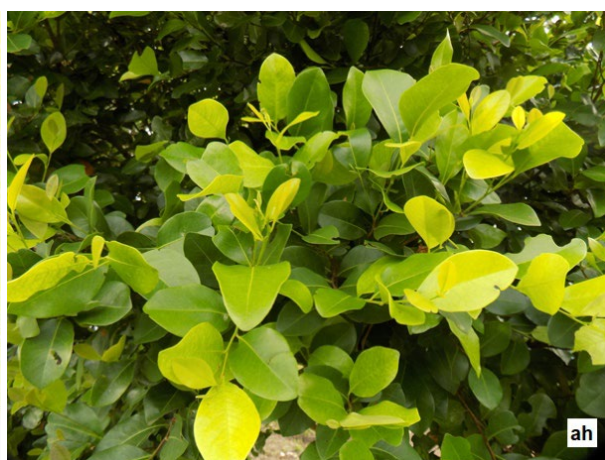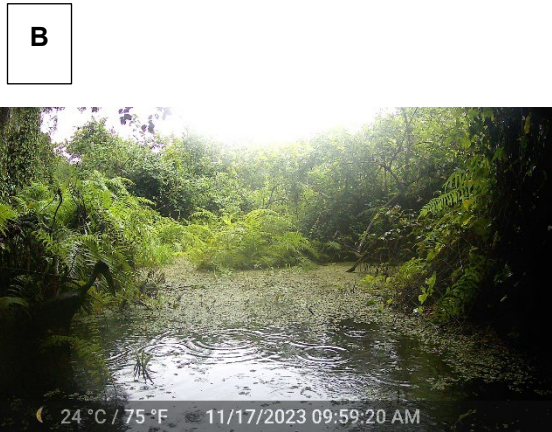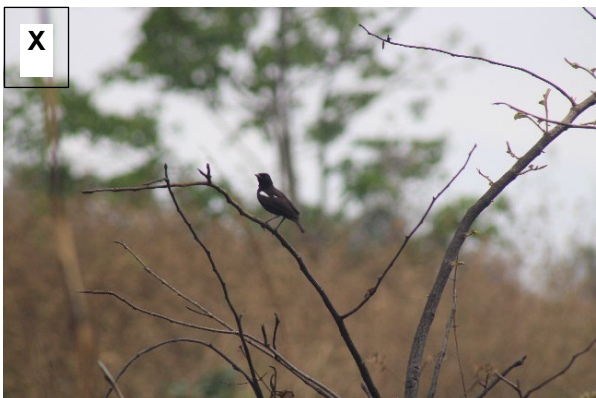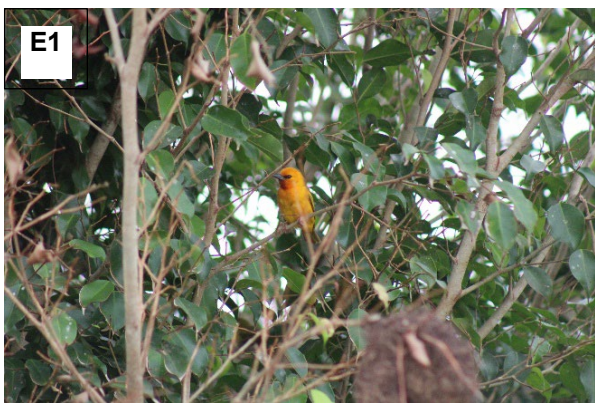
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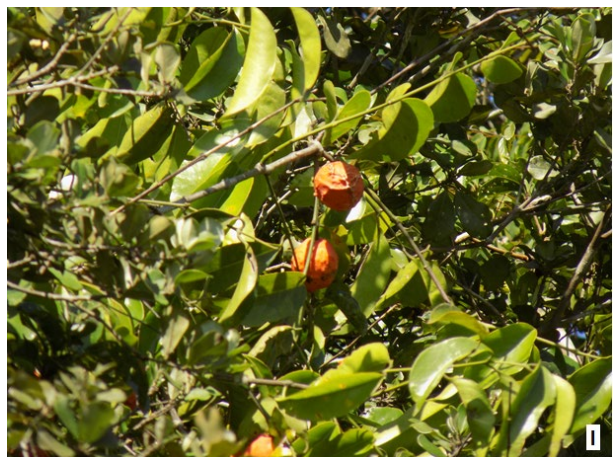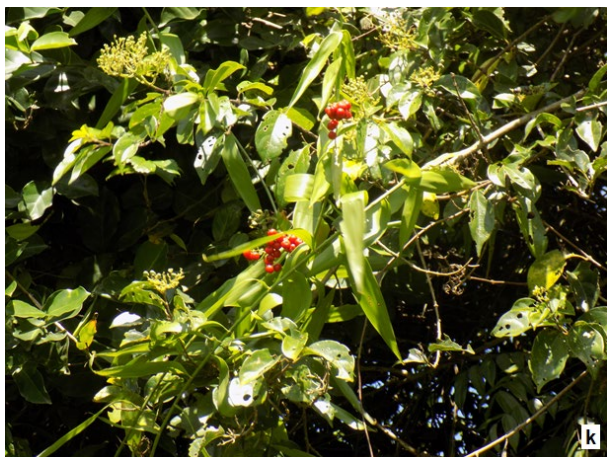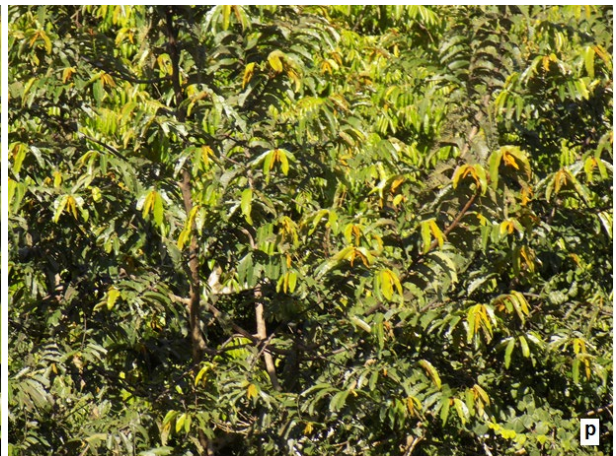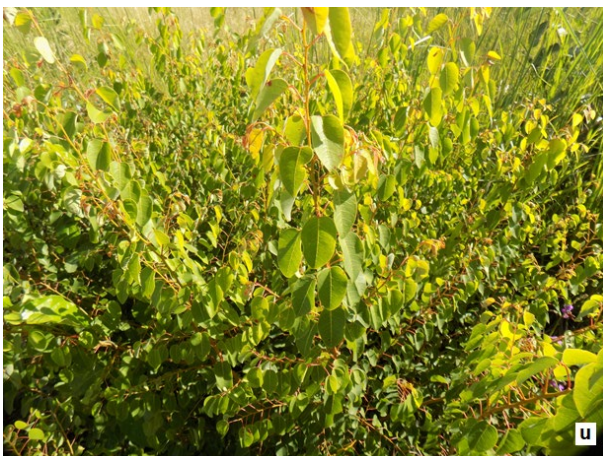
APPENDIX C

Bird field survey data

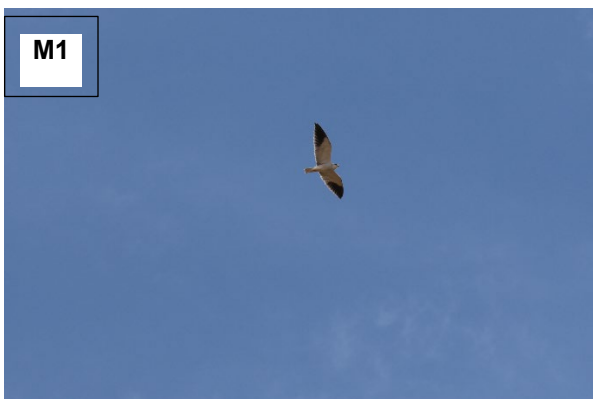## Photographic Records of the Birds & Bats Assessment

Legend: A)*Tringa stagnatilis* ;**B**) *Anastomus lamelligerus*; **C**) *Bubulcus ibis*; **D**)*Calidris alba* ;**E**) *Ceryle rudis*; **F**) *Corvus albus*; **G**)*Estrilda melpoda* ; **H**)*Eurystomus gularis*; **I**)*Gypohierax angolensis*; **J**) *Cecropis semirufa*; **K**)*Passer domesticus*; **L**)*Merops pusilus*; **M**)*Vidua macroura*; **N**)*Eurillas curvirostris;* **O**) *Cinnyris bifasciatus*; **P**) *Vanellus lugubris* **Q**)*Lanius collaris*; **R**)*Passer domesticus;* **S**)*Estrilda astrild;* **T**)*Passer griseus;* **U**)*Upupa epops;* **V**) *Lagonosticta rubricata;* **W**)*Merops bullockoides*; **X**) *Myrmecocichla nigra* **Y**) *Cichladusa ruficauda* **Z**)*Dicrurus ludwigii;* **A1**)*Turtur afer* **B1**)*Ipsina picta;* **C1**) *Halcyon malimbica* **D1**)*Pycnonotus barbatus;* **E1**)*Ploceus ocularis;* **F1**)*Bostrychia hagedash;* **G1**) *Halcyon albiventris;* **H1**)*Colius striatus;* **I1**) *Tauraco macrorhynchus;* **J1**) *Bycanistes albotibialis;* **K1**) Cecropis abyssinica; **L1**)*Polyboroides typus;* **M1**) *Elanus caeruleus;* **N1**)*Ploceus cucullatus*; **O1**)*Falco rupicolus.*