



Vegetation survey of Mlele Beekeeping Zone in 2018



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Acknowledgements

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Abstract

A vegetation survey of Mlele Beekeeping Zone (BKZ) in Inyonga District has been conducted in 2018. The objective of the survey was a) to detect possible vegetation changes within the Mlele BKZ and b) to assess the current stage of the vegetation of the whole Mlele BKZ and its current threats (baseline).

13 plots out of the 30 vegetation plots from the 2004 survey have been resurveyed during this assessment. The species richness of the Mlele BKZ comprises 83 species for the 2018 vegetation survey. The 13 vegetation plots resurveyed will serve as permanent plots for monitoring and evaluating any vegetation changes at site level.

Moreover, two vegetation transects of about 10 km length each have been outlined and 800 vegetation points have been sampled with the Point-Centered Quarter Method (PCQM). Tree density, basal area, dominant tree height, and estimated standing volume are significantly higher on upper land compared to the miombo woodlands below the escarpment.

The most frequent trees/shrubs in Mlele BKZ in the lower diameter class (DBH < 20cm) are *Diplorhynchus condylocarpon*, *Pseudolachnostylis maprouneifolia*, and *Pterocarpus angolensis*. These species are quite fire-tolerant what may explain their prevalence in the annually burnt Mlele BKZ. In the upper diameter class (DBH ≥ 20cm) *Julbernardia globiflora* and *Brachystegia manga/utilis* are the most frequent tree species in Mlele BKZ. Young *Pterocarpus angolensis* from the lower diameter class (DBH < 20cm) are widespread in Mlele BKZ and are amongst the five most frequent and dominant species.

The vegetation surveys in 2018 allowed completing substantially the former tree/shrub list for Mlele BKZ from Mwangulango (2004). The checklist now includes in total 123 trees/shrubs with their scientific and Konongo names including also species identified from opportunistic sampling.

In total 28 human site disturbances have been assessed including 34 trees cut (many of them *Pterocarpus angolensis*) along the two transects covering roughly an area of 160 ha. About 80% of the disturbances happened on the lower land what may be explained by the proximity of the principal road Inyonga to Mpanda.

The use of the PCQM along the vegetation transects is an appropriate and quite simple method to assess the vegetation baseline and in addition also all human disturbances along the transects. It is suggested to use this method also for the neighbouring protected areas what would allow to compare ecosystem (vegetation) health of protected areas under different managements.

The Miombo habitats of Mlele BKZ are well protected. No sign of recent poaching was detected and no logging happened in the last five years in the two belt transects as a result of the participatory management of the beekeeping zone with regular patrolling, support of beekeeping activities and awareness raising campaign by the Project.

List of abbreviations

ADAP	Association for the Development of Protected Areas
ba	Basal area
BKZ	Beekeeping Zone
DBH	Diameter at Breast Height
FR	Forest Reserve
GCA	Game Controlled Area
IBA	Inyonga Beekeepers Association
MNRT	Ministry of Natural Resources and Tourism
MoU	Memorandum of Understanding
NGO	Non Governmental Organisation
PA	Protected Area
PCQM	Point-Centered Quarter Method
TAWA	Tanzania Wildlife Management Authority
TFS	Tanzania Forest Services Agency
VGS	Village Game Scout

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1) Introduction

Following a transfer of management rights negotiated with the government in 2010, the Mlele Beekeeping Zone (BKZ) is managed by the Inyonga Beekeepers Association (IBA) in collaboration with the District authorities and the villages. Since 2002, ADAP (Association for the Development of Protected Areas) is supporting IBA in beekeeping activities and conservation of natural resources in general of the BKZ. ADAP is a Swiss NGO based in Geneva founded in 1997. Its objective is to generate additional incomes for local communities in order to gain their support for environmental conservation.

The current forest resources of the Mlele BKZ and their threats are not well known. According to the National Forest Policy 1998 as well as the Forest Act, No. 14 of 2002, a forest management plan, including a harvesting plan, needs to be established for all forest reserves. The current harvesting plan for Mulele Hills FR was established in 2014 relying heavily on the former forest inventory conducted by the Ministry of Natural Resources and Tourism (MNRT) through the Forestry and Beekeeping Division in 2005 and on other secondary data from 2006-2014 such as annual district forest harvesting reports, tree felling licences, transit passes and illegal harvesting reports (TFS 2014). No field survey has been carried out to verify and to update these secondary data. Therefore, the current harvesting plan of the Mulele Hills FR might not be realistic.

In 2004, ADAP has mandated a tree survey of Mlele BKZ in order to know the melliferous trees and their abundance, the use of forest products and the human disturbances (Mwangulango 2004). A discussion with Oscar Malembeka, a retired Village Game Scout (VGS) who accompanied the late Nathan Mwangulango in the vegetation survey allowed clarifying their methodology used. A main objective of the 2004 survey was to establish 30 permanent vegetation plots for monitoring vegetation changes over time. Unfortunately, this objective was not respected in the second vegetation survey carried out in 2013 (Kayombo et al. 2013) where new 42 new plots were established following a different methodology. Therefore, any direct comparison of the results of the tree survey of 2013 with 2004 is hampered and any possible vegetation change cannot be detected.

The **objective** of the new vegetation survey in 2018 was twofold:

- a) to detect possible vegetation changes within the Mlele BKZ and
- b) to assess the current stage of the vegetation of the whole Mlele BKZ and its current threats (baseline).

To establish any possible vegetation changes we decided to resurvey only vegetation plots from the 2004 survey. This choice was based on the following reasons:

- Longer time period for detecting vegetation changes (2004-2018);
- The regeneration potential of the plots (trees/shrubs < 20 cm have only been recorded in 2004 (Mwangulango 2004);
- Exact location of plots (coordinates) not clear in the 2013 vegetation survey (Kayombo et al. 2013);
- Unfortunately we could not meet the authors of the 2013 vegetation survey to clarify their methodology applied.

The vegetation plots from 2004 have been established mostly along roads often nearby the boundary where access is easier. Possible vegetation changes in individual plots are barely representative for the whole area of Mlele BKZ.

Therefore, we decided in addition to the survey of permanent vegetation plots from 2004, to outline two vegetation transects of about 10 km length each for improving the data set and

having a sound baseline for 2018. Thereby, also all human disturbances could be assessed along the transects.

This third vegetation survey has been assessed by two field trips. Dr. Urs Bloesch led the team composed of Frank Mbago (22 June to 26 June 2018) and the VGSs Dicksoni Malembeka, Johni Gervasi, and Felesiano Futakamba in the first field trip from 22 June to 2 July 2018. Lucile Daudet together with the VGS completed in a second field trip from 9 to 14 September 2018 the two vegetation transects.

The rainfall was exceptionally high in the preceding rainy season resulting in very tall and dense grass layer. Some of the larger Mbugas¹ were still flooded but most of the few existing tracks were passable by car during the first field trip while during the second field trip towards the end of the dry season in September the grass layer and the soil were dry along the transects.

2) Study area

Miombo woodland is the dominating vegetation type of unimodal rainfall areas in southeastern Africa (Smith & Allen 2004). Miombo woodlands are the most extensive vegetation type in Tanzania (Shirima et al. 2014) thereby playing a key role as carbon source and sink. Miombo woodlands are characterized by a distinct and often continuous grass layer and an open to closed tree canopy layer and often annually burnt. Miombo are dominated by the genera *Brachystegia* and *Julbernardia* with *Brachystegia spiciformis* and *Julbernardia globiflora* as the most common tree species (Frost 1996).

Usually we distinguish between floristically rich “wetter miombo” of the higher rainfall areas (>1000 mm per annum) and floristically more poor “drier miombo” (<1000 mm per annum). Miombo woodlands have a low soil nutrient content, are well drained, highly leached, acidic and low in organic matter (Frost 1996). The timber and non-timber products from the miombo woodlands are essential for the livelihoods of millions of people living inside and outside the miombo woodlands (Malaisse 1997).

The BKZ in Mlele District is located northwest of Inyonga township, along the main road to Mpanda and the road to Rukwa Game Reserve Headquarters covering an area of about 850,000 ha. Mlele BKZ is surrounded by a dense network of protected areas in Katavi Region (see Fig. 1). The altitude of Mlele BKZ ranges between 1200 to 1500 m a.s.l. from the lower land in the northeast to the upper land (hilltop, plateau) in the southwest separated by the escarpment.

Miombo woodlands are the predominating vegetation type in Mlele BKZ (Mwangulango 2004, Kayombo et al. 2013) covering more than 90% of the area. The average annual rainfall is estimated to oscillate between 1000 and 1200 mm. The miombo type is transitional between “drier” and “wetter” miombo. The seasonally waterlogged mbugas are mainly covered with grasslands and occasionally with few trees and shrubs (wooded grasslands). Narrow riverine forests occur along the permanent and seasonal streams and some evergreen forest patches exist on deeper soils in depressions (south of Ngaramira area and at Masigo according to Kayombo et al. 2013).

Mlele BKZ is part of the Mulele Hills Forest Reserve of 519,295 ha which was gazetted in 1953 (TFS 2014). Based on the memorandum of understanding (MoU) with the Ministry of

¹ Seasonally waterlogged grasslands and grass savannas; term frequently used in Tanzania.

Natural Resources and Tourism (MNRT) in 2010, IBA is managing the beekeeping zone on behalf of the MNRT. The MoU is currently under revision as requested by the Tanzania Forest Services Agency (TFS). TFS was established in 2011 as an executive agency with the mandate of managing national forests (natural and plantations) and bee resources in a sustainable manner by ensuring sustainable supply of various forest and bee products and services, stable ecosystem and maintaining biological diversity. Mlele FR is also a Game Controlled Area (GCA) under the auspice of the Tanzania Wildlife Management Authority (TAWA) from the MNRT. Moreover, hunting companies which have also anti-poaching and road maintenance tasks are active in Mlele FR.

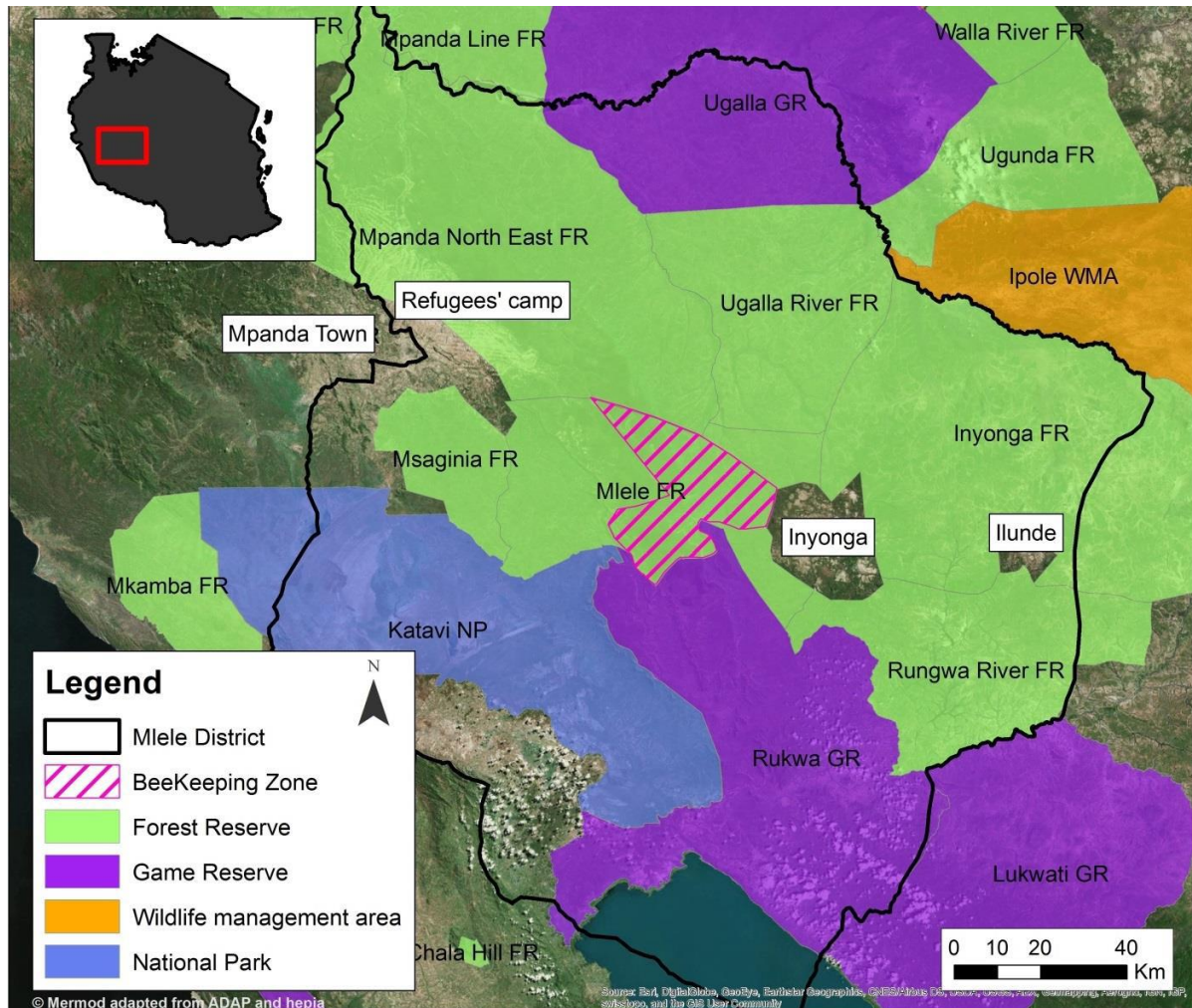


Fig. 1. Beekeeping zone and other protected areas of Mlele District, in Katavi Region (Mermod 2016).

The Wakonongo are the original tribe of Mlele District. Traditionally they were hunter-gatherer practising slash-and-burn agriculture having an intimate relation with the miombo woodlands (Mermod 2016).

3) Methods

3.1 Data collection

Vegetation plots

13 plots out of the 30 vegetation plots from 2004 (Mwangulango 2004) have been resurveyed from 23 to 28 June (see Appendix A and D). For time reasons, facility in access was considered in the selection of the plots for this survey.

As far as possible the methodology from 2004 was respected. Note that Mwangulango (2004) did not explicitly specify the minimal Diameter at Breast Height (DBH²) recorded for the lower diameter < 20 cm class (probably DBH \geq 7 cm); we recorded all trees with a DBH \geq 3 cm. Unfortunately, Mwangulango (2004) gives only the total number of tree species of the upper and lower diameter class without indicating the exact DBH of each tree recorded. Therefore, the basal area and the class diameter distribution for each tree species could not be established for the 2004 vegetation survey.

For time and practical reasons the size of the vegetation plots from 2004 was reduced to a circular sample plot of 0.1 ha (radius of 17.85m). Recording of all trees and shrubs in a rectangular plot of 100 x100 m (plot numbers 1 - 15) or 50 x 50 m (plot numbers 16 – 30) as in the 2004 survey seemed to us very difficult to realise and is also very time-consuming. Therefore, we used smaller and circular plots which are easier to survey using a measure tape from the centre of the plot. Finally, the 2018 survey recorded the following parameters:

- Location and general site description: we use a handheld GPS (Garmin 12 XL) to find the coordinates of the centre of the 2004 plot and to record the elevation; the nearest tree was selected and marked with white colour (in 2004 blue colour was used to mark the trees of the plot); slope and slope exposure were determined with a Büchi compass (P3252).
- Systematically, each plot centre was photographed in each cardinal direction (Canon powershot S95) resulting in 52 photographs in total (see example in Fig.2).
- Each tree/shrub species with a DBH \geq 3 cm has been identified and its diameter recorded. This allows establishing for each species the diameter class distribution. The diameter of multi-stemmed trees has been taken for each single stem (DBH \geq 3 cm) for calculating the basal area (ba). For calculating the tree density per ha, multi-stemmed trees are considered as one tree.
- The height of the dominant trees has been estimated visually (ocular estimation) using a levelling rod of 2 m height as a reference at the base of the trunk.
- The canopy cover³ of the dominant trees and of the understorey has been recorded assuming that all trees/shrubs are in full foliage; in addition the vegetation cover of the herbaceous layer has been estimated and the dominant species recorded according to the cover-abundance scale from Braun-Blanquet (1964).

² Diameter at breast height, or DBH, is a standard method of expressing the diameter of the trunk or bole of a standing tree at 1.3m height.

³ Percentage of the soil surface covered by vertically projected tree and shrubs crowns.

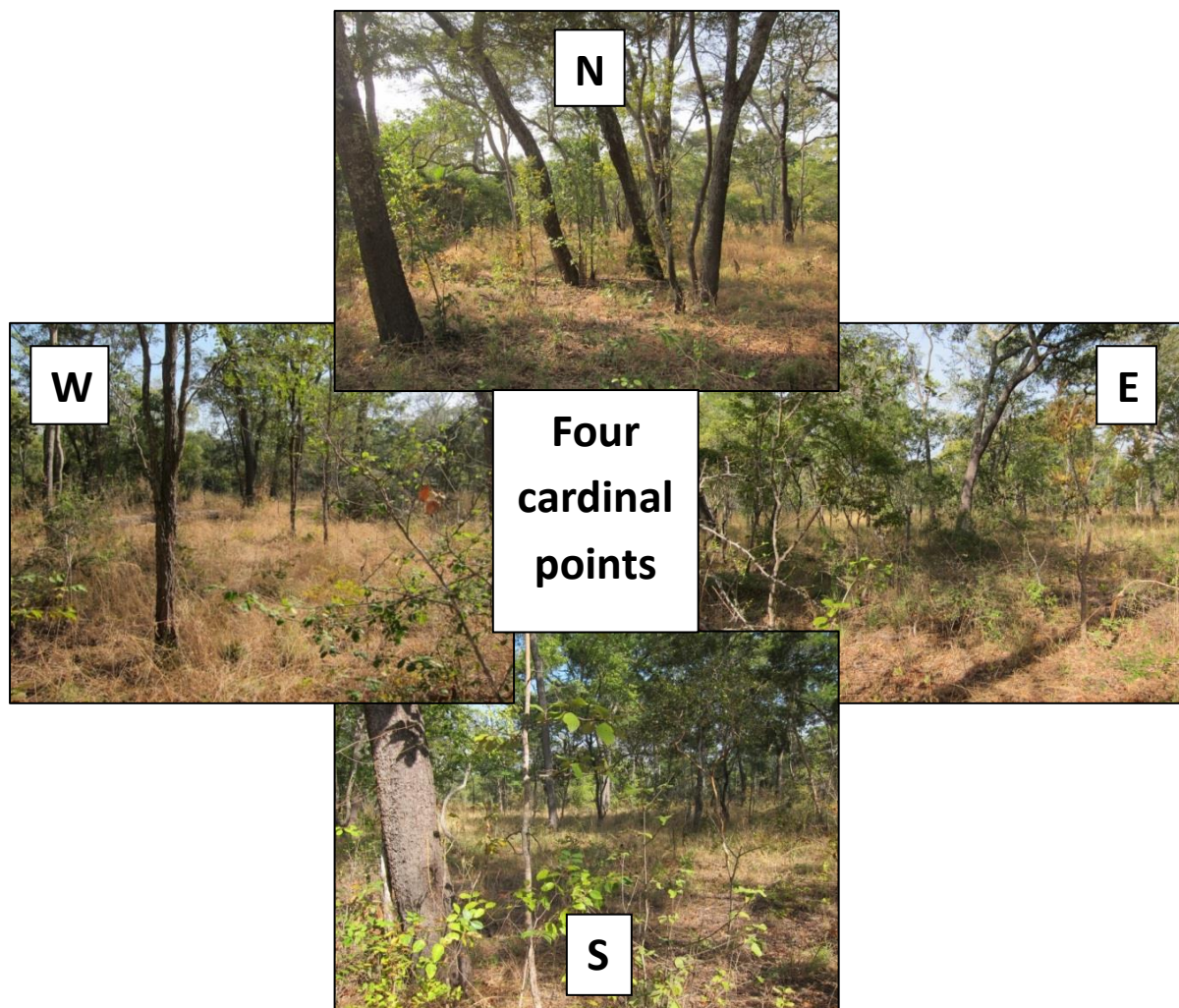


Fig. 2. Example of visual illustration through photographs from the centre of the plot in each cardinal direction (here vegetation plot 3).

Transects

Google Earth has been used for locating the transects. The main vegetation types (canopy cover) within Mlele BKZ and possible access constraints for sampling along the transects have been quickly identified. Transects should be outlined perpendicular to the main mountain ridges thereby following a variable slope gradient with different vegetation types. Finally, two transects have been established with an azimuth of 47° or 227° considering possible access by existing tracks (see Appendix D). The first transect is located on the upper land starting at the boundary road about 300 m southeast from the IBA camp (azimuth of 47°). A nearby track east of the transect was facilitating the access for the first five kilometres. A second transect was located on the lower land starting from the main Mpanda road (azimuth of 227°). The nearby German road has similar direction thereby facilitating access the sampling on transect for about ten kilometers.

Along the transects the Point-Centered Quarter Method (PCQM) has been used (Mueller-Dombois, & Ellenberg 1974). Four quarters are established at the sampling point through a cross formed by two lines. One line is the compass direction (47° or 227°) and the second a line running perpendicular to the compass direction through the sampling point. The distance

to the mid-point of the nearest tree from the sampling point is measured in each quarter (see Fig. 3). The interval between two sampling points has been set at 300 steps systematically.

50 points have been recorded along each transect resulting in a transect length of about 10 km. The first 27 points of the first transect on upper land have been recorded from 29 June to 1 July 2018, while the remaining 23 points have been recorded from 13 to 14 September 2018. The second transect on lower land nearby German road has been recorded on 2 July 2018 (first 8 points) and completed for the remaining points (9 – 50) from 9 to 12 September 2018. This plotless method has the advantage in that they do not require laying out plot boundaries what saves considerable time.

We used a handheld GPS (Garmin 12 XL) to record the coordinates of each sampling point. All tree/shrub species and their DBH were recorded separately for two size categories: larger trees (DBH \geq 20 cm) and smaller trees/shrubs ($3 \geq$ DBH < 20 cm). The height of the dominant trees has been estimated visually (ocular estimation) using a levelling rod of 2 m height as a reference at the base of the trunk. Slope and slope exposure were determined with a Büchi compass (P3252). Systematically, each direction of the cross marking the four quarters was photographed from the sampling point (Canon powershot S95) resulting in 200 photographs for each transect (see example in Fig. 2). The data for the two transects are given in Appendix B.

The parameters obtained with the PCQM method are (Mueller-Dombois, & Ellenberg 1974):

- Species;
- Density (from mean distance);
- For each tree its diameter class diameter distribution;
- Basal area (ba) and dominance for each species;
- Absolute frequency (as the occurrence of a species at a sampling point).

The tree basal area⁴ of the surrounding stand was also estimated additionally in a simple but efficient way using the Bitterlich method (1948). Please note that the Bitterlich method was only applied in the vegetation survey from 22 June to 2 July 2018.

The Bitterlich method counts trees (shrubs) in a circle from the sampling point with an angle-gauge (wooden stick of 50 cm length with a fixed small metal sheet with four angular widths at its end). Only trees (shrubs) that are larger in diameter than the smallest angular width (counting factor $k = 1$) are included in the count.

⁴ Tree basal area is the cross-sectional area (over the bark) at breast height (1.3 metres above the ground) measured in square meters.



Fig. 3. PCQM method: Distance to the mid-point of the nearest tree from the sampling point is measured in each quarter and tree species and diameter is recorded.

All human ecosystem disturbances have been recorded on both sides along the transects by two VGSs (total sampling width of 80 m). Each VGS surveyed one half (i.e. 40 m) of the total width of the belt transect. Disturbances could include logging (saw pits, stumps), tree barking (for bee hives, ropes), trapping, infrastructures (camps), encroachments, and grazing by cattle. Please note that fire signs were not recorded since most of the miombo woodlands are burnt annually.

3.2 Data analysis

If plants could not be identified in the field, voucher specimens were identified by Frank Mbago at the herbarium of the University of Dar es Salaam. A plant list of all recorded specimen has been elaborated (see Appendix C).

For the permanent vegetation plots, mean α -diversity (mean number of species of subunits), γ -diversity (total species diversity for the landscape and β -diversity ($\beta = \gamma / \alpha$) were defined (see Whittaker 1970).

For the vegetation transects, absolute frequency i.e., the occurrence of a species at the sampling points has been calculated as follows:

(N points with species/total points) x 100.

Moreover, the species dominance as product of mean ba and number of species per ha has been calculated.

As an example the diameter class distribution of the highly searched Mninga (*Pterocarpus angolensis*) timber species has been established in a diagram.

4) Results

Vegetation plots 2004 / 2018

The vegetation data of the 13 permanent vegetation plots resurveyed in 2018 are presented in Appendix A (data 2004 and 2018). Most of the marked trees of the resurveyed vegetation plots from 2004 had still their blue marks.

As outlined a direct comparison between the vegetation surveys of the permanent plots from 2018 and 2004 is difficult and not possible for some parameters due to:

- a) Different size of the plots in 2004 and 2018;
- b) The 2004 survey distinguishes only between DBH smaller or larger (equal) 20 cm and do not indicate the exact DBH of a trees/shrub (basal are cannot be defined);
- c) Minimal diameter for the lower diameter class not specified in the 2004 survey.



Fig. 4. Large *Brachystegia spiciformis* tree on the upper land.

Table 1 below shows different diversity indices of the species richness for the vegetation surveys in 2004 and 2018.

Table 1: Species diversity indices

Species diversity indices	Survey 2004 (plot size 1 ha and 0.25 ha)	Survey 2018 (plot size 0.1 ha)
Mean α -diversity	34.2	19.4
β -diversity	3.2	4.3
γ -diversity	108	83

Table 2 below lists the tree/shrub density for the vegetation surveys in 2004 and 2018.

Table 2: Tree and shrub density

Tree/shrub density	Survey 2004 (plot size 1 ha and 0.25 ha)	Survey 2018 (plot size 0.1 ha)
Mean tree/shrub density (DBH < 20 cm) per ha	- ⁵	508 (317 ⁶)
Mean tree density (DBH \geq 20 cm) per ha	141 (30)	118 (42 ⁶)

Vegetation baseline using transects

Table 3 below includes the tree/shrub density, the mean basal area, estimated mean tree height, and estimated standing volume per ha for the miombo landscape on upper land (transect 1) and lower land (transect 2).

Table 3: Forest parameters

	Transect 1 upper land			Transect 2 lower land		
	$\emptyset < 20\text{cm}$	$\emptyset \geq 20\text{cm}$	Total	$\emptyset < 20\text{cm}$	$\emptyset \geq 20\text{cm}$	Total
Tree/shrub density/ha	414.77	84.3		324.2	50.4	
Mean basal area/ha (m ²)	2.69	8.91	11.60	2.43	4.95	7.38
Estimated mean tree height (m) ⁷	6	11		5	8	
Estimated standing volume/ha (m ³) ⁸	8.1	49.0	57.1	6.1	19.8	

⁵ Minimal diameter recorded not specified.

⁶ Standard deviation

⁷ Mean tree height for the canopy and the understorey on upper land estimated at 11 m (from mean dominant tree height: 14.6 m) and 6 m, respectively; mean tree height for the canopy and the understorey on lower land estimated at 8 m (from mean dominant tree height: 9.6 m) and 5 m, respectively.

⁸ The standing volume was estimated using a mean tree coefficient of 0.5.

The absolute frequency of the first five tree/shrub species for the lower (DBH < 20cm) and the upper diameter class (DBH ≥ 20cm) is presented for both transects in tables 4 and 5 below.

Table 4: Absolute frequency for transect 1 on upper land

Ø < 20cm		Ø ≥ 20cm	
Species	Absolute frequency	Species	Absolute frequency
<i>Brachystegia glaucescens</i>	28	<i>Julbernardia globiflora</i>	48
<i>Diplorhynchus condylocarpon</i>	28	<i>Brachystegia spiciformis</i>	46
<i>Pseudolachnostylis maproun.</i>	26	<i>Parinari curatellifolia</i>	28
<i>Hexalobus monopetalus</i>	24	<i>Brachystegia manga/utilis</i> ⁹	18
<i>Pterocarpus angolensis</i>	22	<i>Anisophyllea pomifera</i>	18

Table 5: Absolute frequency for transect 2 on lower land

Ø < 20cm		Ø ≥ 20cm	
Species	Absolute frequency	Species	Absolute frequency
<i>Diplorhynchus condylocarpon</i>	32	<i>Brachystegia manga/utilis</i>	38
<i>Pseudolachnostylis maproun.</i>	32	<i>Brachystegia glaucescens</i>	32
<i>Brachystegia manga/utilis</i>	22	<i>Julbernardia globiflora</i>	32
<i>Pterocarpus angolensis</i>	22	<i>Pterocarpus angolensis</i>	22
<i>Combretum fragrans</i>	20	<i>Pericopsis angolensis</i>	16
<i>Hymenocardia acida</i>	20		

The dominance values for the first five tree/shrub species for the lower (DBH < 20cm) and the upper diameter class (DBH ≥ 20cm) is presented for both transects in tables 6 and 7 below.

Table 6: Species dominance for transect 1 on upper land

Ø < 20cm		Ø ≥ 20cm	
Species	Ranking	Species	Ranking
<i>Pterocarpus angolensis</i>	1	<i>Brachystegia spiciformis</i>	1
<i>Pseudolachnostylis maproun.</i>	2	<i>Julbernardia globiflora</i>	2
<i>Brachystegia glaucescens</i>	3	<i>Brachystegia manga/utilis</i>	3
<i>Phyllocosmus leimareanus</i>	4	<i>Parinari curatellifolia</i>	4
<i>Brachystegia spiciformis</i>	5	<i>Erythrophleum africanum</i>	5

Table 7: Species dominance for transect 2 on lower land

Ø < 20cm		Ø ≥ 20cm	
Species	Ranking	Species	Ranking
<i>Diplorhynchus condylocarpon</i>	1	<i>Brachystegia glaucescens</i>	1
<i>Pseudolachnostylis maproun.</i>	2	<i>Brachystegia manga/utilis</i>	2
<i>Brachystegia manga/utilis</i>	3	<i>Julbernardia globiflora</i>	3
<i>Oldfieldia dactylophylla</i>	4	<i>Pterocarpus angolensis</i>	4
<i>Pterocarpus angolensis</i>	5	<i>Pericopsis angolensis</i>	5

⁹ The species is either *Brachystegia manga* or *Brachystegia utilis*.

The diameter class distribution of Mninga (*Pterocarpus angolensis*) is shown in Fig. 5 below.

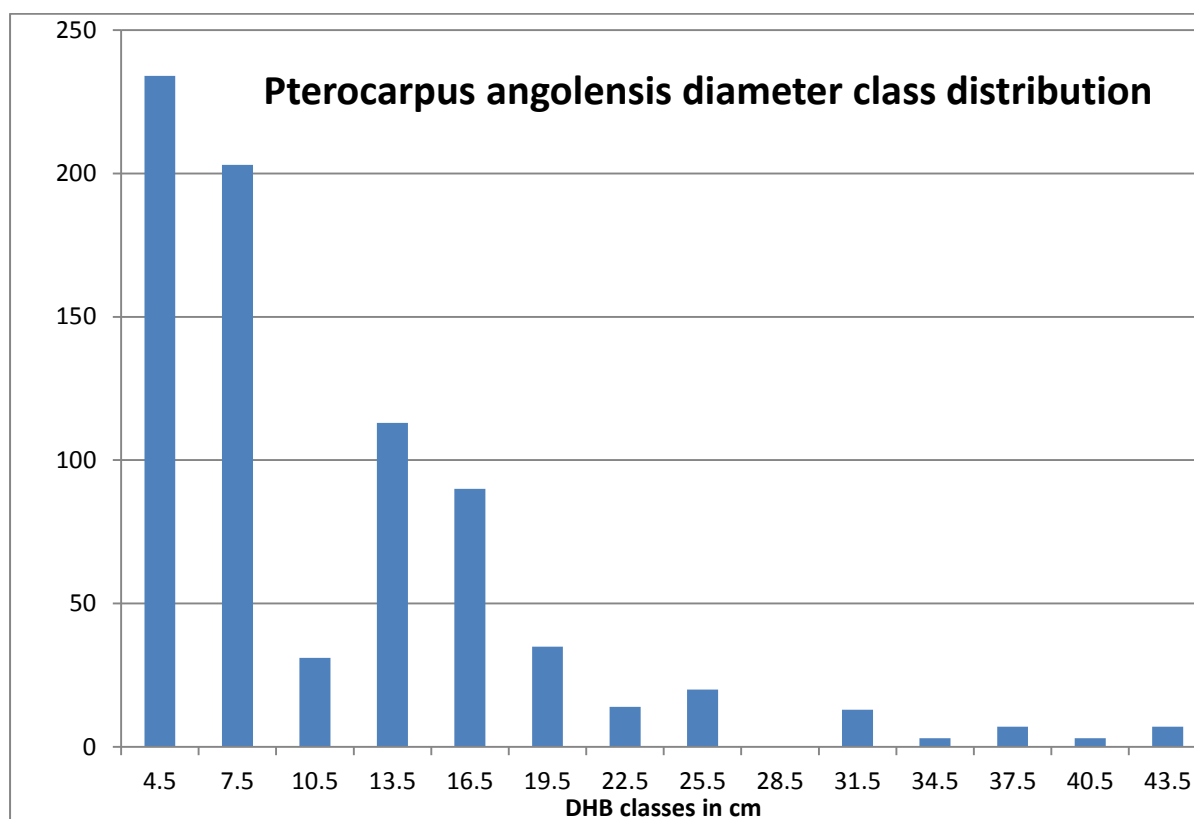


Fig. 5. Diameter class distribution of *Pterocarpus angolensis*.

The vegetation surveys in 2018 allowed completing substantially the former tree/shrub list for Mlele BKZ from Mwangulango (2004). The checklist now includes in total 123 trees/shrubs with their scientific and Konongo names including also species identified from opportunistic sampling (see Appendix C). This quite exhaustive plant list including for most species the vernacular name will be very useful for any vegetation work in future.

All human disturbances recorded on a width of 80 m along transect 1 on upper land and transect 2 on lower land are summarised in tables 8 and 9 below.

Table 8: Human disturbances along transect 1 on upper land

Type of disturbances	Magnitude (quantity)	Position along the transect
Logging	1 <i>Pterocarpus a.</i> cut (>10 yrs) 1 <i>Monotes katangensis</i> recorded cut for pole 1 <i>Pterocarpus a.</i> cut (>10 yrs) (10 steps)	Point 3, +75 steps Point 10 Point 12, +10 steps
Building constructions	Beekeepers' camp	Point 3, +30 steps
Tree cutting for harvesting wild honey	1 <i>Pterocarpus angolensis</i> cut for wild honey harvesting (4 yrs) 1 tree cut for honey	Point 25, +130 steps Point 46, +20 steps
Total disturbances	6 site disturbances, 5 trees cut	

Table 9: Human disturbances along transect 2 on lower land

Type of disturbances	Magnitude (quantity)	Position along the transect
Logging	3 <i>Pseudolachnostylis m.</i> cut for poles (Ø 12-15 cm; >5 yrs) 5 <i>Pterocarpus angolensis</i> cut for timber (>5 yrs) (90 steps) 1 <i>Julbernardia g.</i> tree barking for bee hives (Ø 30 cm; >5 yrs) 1 <i>Pterocarpus angolensis</i> cut for timber (Ø 35 cm; >5 yrs) 1 <i>Julbernardia globiflora</i> cut for timber? (Ø 25 cm; >5 yrs) 1 tree cut for timber (>10 years) 1 tree cut for timber (>10 years) 1 tree cut for timber (>10 years) 1 tree cut for timber (>10 years) 1 tree cut for timber (>10 years) 1 tree cut for timber (>10 years) 1 tree cut for timber (>10 years) 1 tree cut for timber (>10 years) 1 tree cut for timber (> 5 years)	Point 6, +30-50 steps Point 6, +90 steps Point 6, +145 steps Point 7, +190 steps Point 9, +280 steps Point 10, +20 steps Point 11, +10 steps Point 11, +64 steps Point 11, +130 steps Point 11, +175 steps Point 11, +240 steps Point 14, +28 steps
Tree cutting for harvesting wild honey	1 <i>Brachystegia utilis</i> cut for wild honey harvesting 1 tree cut for wild honey harvesting (> 5 years) 1 tree cut for wild honey harvesting (> 5 years)	Point 7, +50 steps Point 10, +80 steps Point 10, +290 steps
Tree barking	1 <i>Julbernardia g.</i> tree barking for bee hives (Ø 22 cm; >5 yrs) 1 tree debarked for beehives (>3 years)	Point 6, +70 steps Point 11, +280 steps
Tree cutting for harvesting wild honey	2 trees cut for honey 1 tree cut for honey 1 tree cut for honey 1 tree cut for honey (>3 years)	Point 20, +280 steps Point 32, +10 steps Point 33, +170 steps Point 45, +180 steps
Total disturbances	22 site disturbances; 29 trees cut or debarked	

5) Discussions

Vegetation plots 2004 / 2018

The species composition of the Mlele BKZ is rather typical for the wetter Miombo type. *Combretum* and *Acacia* species typical for the drier Miombo are not very abundant. The species richness of the Mlele BKZ comprises 83 species for the 2018 vegetation survey (108 in 2004). This γ -diversity is quite similar with the 86 trees and shrubs recorded by Backéus et al. (2006) in their survey of miombo woodlands in Kilosa District having similar rainfall.

The higher mean α -diversity and γ -diversity of the 2004 vegetation plots is certainly codetermined by the considerably larger plot size of 1 ha (plots 1 – 15) respectively 0.25 ha (plots 16 – 30) what results also in a higher total species richness (γ -diversity). The mean tree density per ha for the upper diameter class (DBH \geq 20 cm) is quite similar in the 2004 and 2018 vegetation surveys with 141 and 118 trees, respectively.

The 13 vegetation plots resurveyed will serve as permanent plots for monitoring and evaluating any vegetation changes at site level.

Vegetation baseline using transects

In total 800 trees and shrubs have been recorded by the PCQM. The two transects have been recorded within ten days, i.e. in average 10 points were sampled per day. The VGSs have been trained on the spot and they mastered the different steps of the methods quite quickly.

Tree density, basal area, dominant tree height, and estimated standing volume are significantly higher on upper land compared to the miombo woodlands below the escarpment (see table 3). This may point to higher soil fertility on upper land and to more and longer inundated wetlands (Mbugas) at the foothill of the escarpment. The higher tree density in the vegetation plots compared to the area covered by the transects might be explained by the selection of the vegetation plots which were placed in 2004 in rather closed and undisturbed miombo vegetation (see table 2 and 3).

The most frequent trees/shrubs in Mlele BKZ in the lower diameter class (DBH < 20cm) are *Diplorhynchus condylocarpon*, *Pseudolachnostylis maprouneifolia*, and *Pterocarpus angolensis* (see tables 4-5). According to Backéus et al. (2006) these three species are quite fire-tolerant what may explain their prevalence in the annually burnt Mlele BKZ. In the upper diameter class (DBH ≥ 20cm) *Julbernardia globiflora* and *Brachystegia manga/utilis* are the most frequent tree species in Mlele BKZ.

The diameter class distribution of *Pterocarpus angolensis* in Fig. 5 shows a distinct underrepresentation for DBH > 18 cm. This IUCN near-threatened species is highly sought for timber (see Jew et al. 2016 and Schwartz et al. 2002). On the other hand, the regeneration of *Pterocarpus angolensis* is quite abundant apart from the 10.5 cm diameter class. Young *Pterocarpus angolensis* from the lower diameter class (DBH < 20cm) are widespread in Mlele BKZ and are amongst the five most frequent and dominant species (see tables 4-7). This is line with Backéus et al. (2006) who reported a good natural regeneration capacity of Mninga, possibly because individuals below logging size have a good seed set. By contrast Boaler (1966) and Schwartz et al. (2002) reported very low recruitment levels for Mninga.

Ecosystem health

The vegetation surveys revealed that the Miombo habitats of Mlele BKZ are intact. Natural regeneration of key species is quite abundant. In addition, the survey along the belt transects of about 20 km length and 80 m width allowed to assess all human disturbances within an area covering roughly 160 ha. We believe that the location and the total length of transects may give quite representative results for Mlele BKZ.

Fires are the prevailing disturbance in Mlele BKZ but their signs have not been recorded during the survey since most of Mlele BKZ is burnt annually including early and late dry season fires. It seems that there is no clear prescribed burning management by IBA for Mlele BKZ. The VGSs are applying both early and late dry season burning although their impact on the tree:grass ratio is adverse thereby either favouring grazers or browsers (see Bloesch 1999, 2008). Moreover, hot late dry season fires may affect melliferous trees and their natural regeneration.

In total 28 human site disturbances has been assessed including 32 trees cut (many of them *Pterocarpus angolensis*) along the two transects. About 80% of the disturbances happened on the lower land what may be explained by the proximity of the principal road Inyonga to Mpanda.

It is remarkable that all recorded human disturbances occurred several years back. No sign of recent poaching was detected and no logging happened in the last five years in the two belt transects. This is quite amazing considering the greatly increased human pressure in recent years on protected areas of the Katavi/Rukwa ecosystem. Illegal activities such as poaching, logging of high value hardwood timber trees, encroachment of farmers's fields, and grazing by Sukuma cattle are more and more threatening the ecosystems (Mermod 2016). As a result, most of these protected areas managed by the central government are increasingly degraded.

On the other hand, the joint management of Mlele BKZ between IBA (ADAP) and the MNRT based on a strong participatory approach with the local communities has allowed an effective protection of the ecosystems in the beekeeping zone. It would be interested to further analyse to what extent this is the result of the efficient protection system in place with regular patrolling of Mlele BKZ by the VGSs or the Project's support of income generation activities (mainly modern beekeeping) and awareness raising.

6) Conclusions

The use of the PCQM along the vegetation transects is an appropriate and quite simple method to assess the vegetation baseline and in addition also all human disturbances along the transects. This method can now also be applied by the trained VGSs to monitor and evaluate changes in the vegetation and in human disturbances. It is suggested to use this method also for the neighbouring protected areas what would allow to compare ecosystem (vegetation) health of protected areas under different managements.

The Miombo habitats of Mlele BKZ are well protected. No sign of recent poaching was detected and no logging happened in the last five years in the two belt transects as a result of the participatory management of the beekeeping zone with regular patrolling, support of beekeeping activities and awareness raising campaign by the Project.

Regarding the management of Mlele BKZ it is suggested to elaborate a vegetation map with the main vegetation units. The vegetation map is an important management tool and will also serve to elaborate a fire management plan for the zone. This map could be also an important planning tool for the district authorities.

7) Recommendations

Based on the observations of the field mission the following recommendations to IBA / ADAP are made:

- 1) Use the transect methodology for monitoring and evaluating any vegetation changes at site level.
- 2) Put the coordinates of the PCQM points on a map to localise the two transects.

- 3) Elaborate a vegetation map of Mlele BKZ with its main vegetation units. The vegetation data from the 2018 field campaign could be used as ground truth for elaborating the map.
- 4) IBA in consultation with TFS should elaborate a fire management plan for Mlele BKZ including a seasonal prescribed burning plan.
- 5) We suggest using the transect methodology with the PCQM for the planned vegetation assessment of Rungwa FR. Appropriate transects should be located using google earth. The trained VGSs from Mlele BKZ will participate at the beginning of the survey until the VGSs from Rungwa FR have been trained on the spot in the methodology.
- 6) Amend the ecological information of the Miombo species and assess the use of the Miombo trees/shrub species for the adjacent local communities (importance for their livelihoods).
- 7) It is suggested to include Tanzanian students in joint BSc/MSc studies with Swiss students.
- 8) Elaborate a paper for a research journal with a focus on the transect methodology using PCQM and its potential for rapidly establishing the vegetation baseline for monitoring and evaluating the vegetation.

8) Bibliography

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Appendix A: Permanent vegetation plots

Vegetation plot 1 (recorded 25/6/2018)

Coordinates: S 6.64310° / E 31.73194° (white-marked *Brachystegia glaucescens*)

Elevation: 1365 m.a.s.l.; slope: +/- flat

Dominant tree height: 16 m;

Vegetation cover: canopy (8-16m): 35%; understorey (2-8m): 10%; herbaceous layer (0-2m): 75%

Herbaceous layer: *Hyparrhenia newtonii* 2, *Urelytrum digitatum* 2, *Margaritaria discoidea* 1, *Smilax anceps* 1, *Zonetriche inamoena* 1

Photos: 5972, 5973, 5974, 5975

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Pseudolachnostylis maproun.</i>	4,11,15,11,11,12,3,7/7,9,5,5/14/15,4,11,8,3=15	25/5=1	37	16
<i>Diplorhynchus condylocarpon</i>	4,4/9,3,3,10,10,7,4,3,5/7/10/17,8,7/10,22=13	22=1	48	6
<i>Julbernardia globiflora</i>	15,8,10,16,12,11=6	28,36/31,20,30=4	18	64
<i>Brachystegia spiciformis</i>	4,10,9,4,10,5,5,4=8	-	23	5
<i>Dichrostachys cinerea</i>	3/5/7,4/8,5/3,3,3,3/3,4/3=7	-	24	-
<i>Erythrophleum africanum</i>	7,12,7,4,4,9=6	-	33	5
<i>Brachystegia glaucescens</i>	10,5,9,10,15=5	-	38	3
<i>Flacourtia indica</i>	3/3,5,3=3	-	8	-
<i>Isobertinia angolensis</i>	14,5,4=3	-	-	11
<i>Vitex doniana</i>	8,3=2	26=1	1	3
<i>Annona senegalensis</i>	4/3=1	-	5	-
<i>Azanza garckeana</i>	3/3=1	-	-	-
<i>Brachystegia utilis/manga</i>	-	21=1	-	-
<i>Burkea africana</i>	5=1	-	-	-
<i>Cassipourea mollis</i>	3=1	-	-	6
<i>Lannea schimperi</i>	-	26=1	2	11
<i>Pterocarpus angolensis</i>	9=1	-	3	2
<i>Kigelia africana</i>	15=1	-	-	-
<i>Anisophyllea pomifera</i>	-	-	-	3
<i>Bobgunnia madagascar.</i>	-	-	12	-
<i>Brachystegia boehmii</i>	-	-	12	3
<i>Combretum collinum</i>	-	-	1	4
<i>Combretum fragrans</i>	-	-	1	-
<i>Combretum psidioides</i>	-	-	1	-
<i>Diospyros cornii</i>	-	-	-	1
<i>Garcinia huillensis</i>	-	-	-	1
<i>Hexalobus monopetalus</i>	-	-	2	-
<i>Hymenocardia acida</i>	-	-	9	-
<i>Lonchocarpus capassa</i>	-	-	-	2
<i>Mallotus oppositifolius?</i>	-	-	14	-
<i>Monotes engleri</i>	-	-	-	1
<i>Ozoroa insignis</i>	-	-	1	-
<i>Parinari curatellifolia</i>	-	-	-	4
<i>Pericopsis angolensis</i>	-	-	-	1
<i>Psorospermum febrifugum</i>	-	-	1	-
<i>Rothmannia engleriana</i>	-	-	1	-
<i>Schrebera trichoclada</i>	-	-	3	-
<i>Securidaca longepeduncul.</i>	-	-	1	-
<i>Strychnos cocculoides</i>	-	-	2	1
<i>Strychnos spinosa</i>	-	-	-	2

<i>Terminalia kaiseriana</i>	-	-	5	2
<i>Ximenia caffra</i>	-	-	2	-
<i>Msinde</i>	-	-	-	1
Tree density (per ha)	740	90	308	158
Species richness	18		39	

Vegetation plot 2 (recorded 25/6/2018)

Coordinates: S 6.60126° / E 31.74842° (white-marked *Julbernardia globiflora*)

Elevation: 1380 m.a.s.l.; slope: +/- flat

Dominant tree height: 22(24) m;

Vegetation cover: canopy (8-22{24}m): 55%; understorey (2-8m): 5%; herbaceous layer (0-2m): 85%

Herbaceous layer: *Antheophora elongata* 2, *Hyparrhenia newtonii* 2, *Urelytrum digitatum* 2, *Indigofera rhynchocarpa* 1, *Tetracera masuiana* 1

Photos: 5976, 5977, 5978, 5979

Remark: Several dead trees

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Julbernardia globiflora</i>	-	33,62,27/28,32/39,25,21, 29,37,40=9	1	56
<i>Ximenia caffra</i>	10,2,9,15=4	-	9	-
<i>Brachystegia spiciformis</i>	-	39,31,34=3	54	-
<i>Diplorhynchus condylocarp.</i>	8,10/11/16=2	-	18	-
<i>Pseudolachnostylis mapr.</i>	14/18,13=2	-	19	2
<i>Cassipourea mollis</i>	14=1	-	7	3
<i>Combretum zeyheri</i>	5=1	-	1	-
<i>Erythrophleum africanum</i>	-	23=1	2	12
<i>Hexalobus monopetalus</i>	7=1	-	34	1
<i>Lannea schimperi</i>	7=1	-	3	2
<i>Terminalia kaiseriana</i>	5=1	-	2	-
<i>Brachystegia glaucescens</i>	-	32=1	10	7
<i>Annona senegalensis</i>	-	-	1	-
<i>Bobgunnia madagascar.</i>	-	-	15	-
<i>Cassia abbreviata</i>	-	-	1	-
<i>Combretum collinum</i>	-	-	4	10
<i>Combretum psidioides</i>	-	-	1	1
<i>Commiphora africana</i>	-	-	1	-
<i>Dichrostachys cinerea</i>	-	-	3	-
<i>Garcinia huillensis</i>	-	-	-	1
<i>Lonchocapus capassa</i>	-	-	4	-
<i>Oldfieldia dactylophylla</i>	-	-	11	-
<i>Pericopsis angolensis</i>	-	-	1	9
<i>Pterocarpus angolensis</i>	-	-	11	11
<i>Rothmannia engleriana</i>	-	-	1	-
<i>Strychnos cocculoides</i>	-	-	-	5
<i>Kaguvaguva</i>	-	-	2	1
Tree density (per ha)	130	140	216	121
Species richness	12		27	

Vegetation plot 3 (recorded 26/6/2018)

Coordinates: S 6.50590° / E 31.72323° (white-marked *Julbernardia globiflora*)

Elevation: 1220 m.a.s.l.; slope: 1-2%, slope exposure: 300°

Dominant tree height: 24 m;

Vegetation cover: canopy (8-24m): 55%; understorey (2-8m): 30%; herbaceous layer (0-2m): 80%

Herbaceous layer: *Margaritaria discoidea* 2, *Hyparrhenia newtonii* 2, *Friesodielsia obovata* 1

Photos: 5984, 5985, 5986, 5987

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Julbernardia globiflora</i>	-	32,42,36,36,50,33,41=7	-	46
<i>Diplorhynchus condylocarp.</i>	8,9,5,9/6,10=5	24=1	16	16
<i>Hexalobus monopetalus</i>	4,4,8/12/15,11,6=5	-	25	2
<i>Burkea africana</i>	13,11,11,15/12=4	-	1	1
<i>Monanthotaxis discolor</i>	12,8,8,7=4	-	8	-
<i>Pseudolachnostylis mapr.</i>	10,15,10/10=3	27=1	13	7
<i>Pavetta stuhlmannii</i>	3,4,3=3	-	-	-
<i>Hymenocardia acida</i>	7,3=2	-	18	6
<i>Phyllanthus engleri</i>	4,3=2	-	5	-
<i>Schrebera trichoclada</i>	3,5=2	-	3	4
<i>Brachystegia utilis/manga</i>	-	33=1	4	16
<i>Bobgunnia madagascar.</i>	11=1	-	2	-
<i>Dalbergia nitidula</i>	9/14=1	-	-	-
<i>Erythrophleum africanum</i>	7=1	-	8	15
<i>Margaritaria discoidea</i>	4=1	-	-	-
<i>Lannea schimperi</i>	-	24/14=1	5	7
<i>Pterocarpus angolensis</i>	-	31=1	6	8
<i>Pterocarpus tinctorius</i>	-	9/53=1	-	8
<i>Pericopsis angolensis</i>	-	24/26=1	6	5
<i>Terminalia cf. mollis</i>	4=1	-	-	-
<i>Azelia quanzensis</i>	-	-	-	3
<i>Annona senegalensis</i>	-	-	5	1
<i>Borassus aethiopicum</i>	-	-	1	-
<i>Brachystegia spiciformis</i>	-	-	7	3
<i>Cassia abbreviata</i>	-	-	-	2
<i>Catunaregam spinosa</i>	-	-	2	-
<i>Crossopteryx febrifuga</i>	-	-	1	-
<i>Combretum collinum</i>	-	-	-	1
<i>Combretum molle</i>	-	-	-	1
<i>Combretum psidioides</i>	-	-	1	-
<i>Flacourtia indica</i>	-	-	3	-
<i>Friesodielsia obovata</i>	-	-	21	-
<i>Garcinia huillensis</i>	-	-	1	-
<i>Kigelia africana</i>	-	-	-	1
<i>Lonchocapus capassa</i>	-	-	2	2
<i>Mallotus oppositifolius?</i>	-	-	44	11
<i>Markhamia obtusifolia</i>	-	-	8	2
<i>Parinari curatellifolia</i>	-	-	1	-
<i>Rothmannia engleriana</i>	-	-	3	-
<i>Sclerocarya birrea</i>	-	-	-	1
<i>Stereospermum kunthianum</i>	-	-	-	2
<i>Terminalia kaiseriana</i>	-	-	2	4
<i>Vangueria madagascariens.</i>	-	-	3	-
<i>Vitex payos</i>	-	-	2	-
Tree density (per ha)	350	140	227	175
Species richness	20		40	

Vegetation plot 5 (recorded 26/6/2018)

Coordinates: S 6.58370° / E 31.88180° (white-marked *Erythrophleum africanum*)

Location: Mtalazia

Elevation: 1180 m.a.s.l.; slope: +/- flat

Dominant tree height: 17-18m m;

Vegetation cover: canopy (10-17/18m): 40%; understorey (2-10m): 15%; herbaceous layer (0-2m): 75%

Herbaceous layer: *Hyparrhenia newtonii* 2, *Julbernardia globiflora* 2, *Pennisetum polystachyon*

Photos: 5988, 5989, 5990, 5991

Remark: 1 old termitaria

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Pseudolachnostylis mapr.</i>	15,8,13,11,4,9,18,16/5=8	22,/24/24=1	22	21
<i>Brachystegia utilis/manga</i>	4=1	25,36,42,26=4	10	41
<i>Terminalia kaiseriana</i>	5,6,11,17=4	24=1	11	-
<i>Diplorhynchus condylocarp.</i>	4,18,11/12,4,4=5	-	10	3
<i>Julbernardia globiflora</i>	6=1	27,22,33=3	8	14
<i>Hymenocardia acida</i>	5,10,13/17=3	-	13	-
<i>Lannea schimperi</i>	-	20/8,20,23=3	-	8
<i>Brachystegia boehmii?</i>	-	42,38=2	-	-
<i>Cassia abbreviata</i>	6,13=2	-	-	-
<i>Combretum molle</i>	11,6=2	-	-	-
<i>Erythrophleum africanum</i>	3,17=2	-	21	9
<i>Schrebera trichoclada</i>	4,5=2	-	1	-
<i>Bridelia duvigneaudii</i>	3=1	-	-	-
<i>Burkea africana</i>	3=1	-	-	1
<i>Dalbergia nitidula</i>	13=1	-	-	-
<i>Hexalobus monopetalus</i>	-	21=1	1	4
<i>Pericopsis angolensis</i>	-	36=1	-	1
<i>Vitex doniana</i>	-	21=1	1	-
<i>Vitex fischeri</i>	6=1	-	-	-
<i>Ziziphus mucronata</i>	-	12/26/6=3	1	1
<i>Borassus aethiopicum</i>	-	-	1	-
<i>Brachystegia glaucescens</i>	-	-	8	15
<i>Bobgunnia madagascar.</i>	-	-	9	-
<i>Cassipourea mollis</i>	-	-	4	-
<i>Combretum collinum</i>	-	-	3	6
<i>Combretum zeyheri</i>	-	-	4	-
<i>Crossopteryx febrifuga</i>	-	-	1	-
<i>Diospyros cornii</i>	-	-	2	-
<i>Flacourtia indica</i>	-	-	3	-
<i>Isobertinia angolensis</i>	-	-	1	7
<i>Mallotus oppositifolius?</i>	-	-	12	-
<i>Monanthotaxis discolor</i>	-	-	6	-
<i>Monotes engleri?</i>	-	-	5	6
<i>Oldfieldia dactylophylla</i>	-	-	1	-
<i>Piliostigma thonningii</i>	-	-	1	1
<i>Pterocarpus angolensis</i>	-	-	1	5
<i>Pterocarpus tinctorius</i>	-	-	-	3
<i>Rothmannia engleriana</i>	-	-	4	-
<i>Strychnos cocculoides</i>	-	-	6	6
<i>Strychnos potatorum</i>	-	-	-	1
<i>Tamarindus indica</i>	-	-	1	-
<i>Vangueria madagascariens.</i>	-	-	2	-
<i>Vitex payos</i>	-	-	1	-

Tree density (per ha)	340	200	175	153
Species richness	20		37	

Vegetation plot 10 (recorded 23/6/2018)

Coordinates: S 6.82835° / E 31.70690° (white-marked *Julbernardia globiflora*)

Elevation: 1420 m.a.s.l.; slope: 3-4%, slope exposure: 100°

Dominant tree height: 20 m;

Vegetation cover: canopy (8-20m): 50%; understory (2-10m): 25%; herbaceous layer (0-2m): 65%

Herbaceous layer: *Antheaphora elongata* 2, *Hyparrhenia newtonii* 2, *Hexalobus monopetalus* 2,

Tetracera masuiana 1

Photos: 5926, 5928, 5929, 5930

Remark: 1 large termitaria

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Diplorhynchus condylocarp.</i>	15,17,15,5,3,3,7=7		34	3
<i>Brachystegia glaucescens</i>	3,3=2	27,24=2	9	2
<i>Julbernardia globiflora</i>	-	47,38,39,51=4	21	49
<i>Lonchocapus capassa</i>	4,4,3=3	-	2	-
<i>Hexalobus monopetalus</i>	3,15=2		57	1
<i>Uapaca nitida</i>	9,7=2	-	-	-
<i>Rhus vulgaris</i>	4,7=2	-	-	-
<i>Anisophyllea pomifera</i>	4=1	-	12	8
<i>Azanza garckeana</i>	4=1	-	-	-
<i>Brachystegia microphylla</i>	3=1	-	-	-
<i>Cassia singueana</i>	5=1	-	-	-
<i>Combretum molle</i>	-	26=1	5	-
<i>Lannea schimperi</i>	5=1	-	1	-
<i>Memecylon flavovires</i>	5=1	-	-	-
<i>Pericopsis angolensis</i>	3=1	-	2	6
<i>Pseudolachnostylis mapr.</i>	9=1	-	2	2
<i>Uapaca kirkiana</i>	7=1	-	10	1
<i>Vitex doniana</i>	-	34=1	2	-
<i>Albizia versicolor</i>	-	-	-	1
<i>Annona senegalensis</i>	-	-	1	-
<i>Bobgunnia madagascar.</i>	-	-	1	-
<i>Brachystegia spiciformis</i>	-	-	9	2
<i>Brachystegia longifolia?</i>	-	-	7	2
<i>Brachystegia taxifolia?</i>	-	-	39	16
<i>Burkea africana</i>	-	-	3	-
<i>Cassia abbreviata</i>	-	-	-	1
<i>Cassipourea mollis</i>	-	-	5	10
<i>Dalbergia nitidula</i>	-	-	4	3
<i>Erythrophleum africanum</i>	-	-	3	5
<i>Flacourtia indica</i>	-	-	-	1
<i>Markhamia obtusifolia</i>	-	-	1	1
<i>Monanthotaxis discolor</i>	-	-	2	-
<i>Monotes engleri?</i>	-	-	-	1
<i>Ochna holstii</i>	-	-	2	-
<i>Oldfieldia dactylophylla</i>	-	-	1	-
<i>Parinari curatellifolia</i>	-	-	63	7
<i>Pterocarpus angolensis</i>	-	-	10	1
<i>Pterocarpus tinctorius</i>	-	-	1	-
<i>Rothmannia engleriana</i>	-	-	2	-

<i>Schrebera trichoclada</i>	-	-	1	-
<i>Vitex payos</i>	-	-	2	-
<i>Ximenia caffra</i>	-	-	3	-
Tree density (per ha)	270	80	317	123
Species richness	18		36	

Vegetation plot 11 (recorded 23/6/2018)

Coordinates: S 6.79391° / E 31.65827° (white-marked *Julbernardia globiflora*)

Elevation: 1475 m.a.s.l.; slope: 3%, slope exposure: 70°

Dominant tree height: 18-20 m;

Vegetation cover: canopy (6-18/20m): 35%; understorey (2-6m): 10%; herbaceous layer (0-2m): 45%

Herbaceous layer: *Hyparrhenia newtonii* 2-3, *Zonetriche inamoena* 1-2, *Psychotria eminiiana* 1

Photos: 5922, 5923, 5924, 5925

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Julbernardia globiflora</i>	-	29,37,39,33,35,31,24,25,50=9	-	62
<i>Hexalobus monopetalus</i>	4,5,4,4,4=5	-	30	-
<i>Phyllocosmus leimareanus</i>	18,8,10=3	27=1	-	-
<i>Brachystegia spiciformis</i>	3=1	77,28,47=3	25	11
<i>Anisophyllea pomifera</i>	18,9=2	22=1	10	7
<i>Erythrophleum africanum</i>	4,8=2	-	2	10
<i>Dichrostachys cinerea</i>	3,5=2	-	13	-
<i>Pseudolachnostylis mapr.</i>	3,4=2	-	13	-
<i>Diplorhynchus condylocarp.</i>	3=1	-	30	-
<i>Brachystegia glaucescens</i>	3=1	-	35	1
<i>Burkea africana</i>	-	22=1	2	1
<i>Lannea schimperi</i>	11=1	-	3	1
<i>Pterocarpus angolensis</i>	8=1	-	2	1
<i>Terminalia kaiseriana</i>	6=1	-	7	-
<i>Vitex doniana</i>	7=1	-	7	2
<i>Albizia versicolor</i>	-	-	7	1
<i>Annona senegalensis</i>	-	-	1	-
<i>Bobgunnia madagascar.</i>	-	-	8	-
<i>Brachystegia sp.</i>	-	-	-	1
<i>Combretum molle</i>	-	-	2	-
<i>Catunaregam spinosa</i>	-	-	1	-
<i>Dalbergia nitidula</i>	-	-	2	-
<i>Garcinia huillensis</i>	-	-	-	1
<i>Lonchocapus capassa</i>	-	-	3	-
<i>Ochna holstii</i>	-	-	8	12
<i>Parinari curatellifolia</i>	-	-	2	7
<i>Protea sp.</i>	-	-	2	-
<i>Rothmannia engleriana</i>	-	-	6	-
<i>Strychnos cocculoides</i>	-	-	3	4
<i>Uapaca kirkiana</i>	-	-	2	-
<i>Vitex payos</i>	-	-	1	-
<i>Ximenia caffra</i>	-	-	11	-
<i>Mtonga</i>	-	-	1	-
Tree density (per ha)	230	150	239	122
Species richness	15		32	

Vegetation plot 12 (recorded 23/6/2018)

Coordinates: S 6.74754° / E 31.62633° (white-marked *Bobgunnia madagascariensis*)

Elevation: 1360 m.a.s.l.; slope: 1-2%, slope exposure: 50°

Dominant tree height: 20-22 m;

Vegetation cover: canopy (10-20/22m): 55%; understorey (2-10m): 10%; herbaceous layer (0-2m): 65%

Herbaceous layer: *Hyparrhenia newtonii* 2, *Hexalobus monopetalus* 1, *Hyparrhenia rufa* 1, *Zonetriche inamoena* 1

Photos: 5934, 5935, 5936, 5937

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Diplorhynchus condylocarp.</i>	10,7,6,3,5,4,7,7,3=9	-	19	--
<i>Phyllocosmus leimareanus</i>	12,24,11,11,13/11=5	-	-	-
<i>Brachystegia spiciformis</i>	4,7,16=3	29/46,34=2	5	15
<i>Julbernardia globiflora</i>	-	32,61,34=3	2	44
<i>Hexalobus monopetalus</i>	3,6,7=3	-	12	2
<i>Anisophyllea pomifera</i>	10,19,15=2	-	10	10
<i>Bobgunnia madagascar.</i>	13,14=2	-	4	-
<i>Brachystegia microphylla</i>	3,5=2	-		
<i>Erythrophleum africanum</i>	3/3=1	21=1	8	8
<i>Lanea schimperi</i>	-	20,21=2	1	3
<i>Albizia antunesiana</i>	14=1	-	-	-
<i>Brachystegia floribunda?</i>	4=1	-	-	-
<i>Bridelia scleroneura</i>	5=1	-	-	-
<i>Cassia abbreviata</i>	10=1	-	1	-
<i>Dichrostachys cinerea</i>	5=1	-	1	-
<i>Lonchocapus capassa</i>	3=1	-	6	-
<i>Parinari curatellifolia</i>	3=1		2	3
<i>Chrysophyllum bangweolen.</i>	4=1		-	-
<i>Strychnos innocua</i>	4=1	-	1	2
<i>Vitex fischeri</i>	4=1		-	-
<i>Ximenia caffra</i>	3=1	-	3	-
<i>Albizia versicolor</i>	-	-	2	1
<i>Azelia quanzensis</i>	-	-	-	1
<i>Annona senegalensis</i>	-	-	2	-
<i>Brachystegia bohmi</i>	-	-	1	22
<i>Cassipourea mollis</i>	-	-	2	-
<i>Dalbergia nitidula</i>	-	-	5	-
<i>Flacourtia indica</i>	-	-	2	-
<i>Garcinia huillensis</i>	-	-	3	1
<i>Kigelia africana</i>	-	-	1	-
<i>Mallotus oppositifolius?</i>	-	-	7	-
<i>Monanthes discolor</i>	-	-	2	-
<i>Monotes engleri?</i>	-	-	1	2
<i>Ochna holstii</i>	-	-	16	8
<i>Pericopsis angolensis</i>	-	-	-	3
<i>Pseudolachnostylis mapr.</i>	-	-	8	7
<i>Pterocarpus angolensis</i>	-	-	2	-
<i>Rothmannia engleriana</i>	-	-	3	-
<i>Schrebera trichoclada</i>	-	-	1	-
<i>Securidaca longependuncul.</i>	-	-	1	-
<i>Strychnos cocculoides</i>	-	-	1	-
<i>Terminalia kaiseriana</i>	-	-	2	1
<i>Trichilia emetica</i>	-	-	1	-
<i>Uapaca kirkiana</i>	-	-	7	-

<i>Uapaca nitida</i>	-	-	3	-
<i>Vitex doniana</i>	-	-	7	-
<i>Vitex payos</i>	-	-	1	-
<i>Mwasya</i>	-	-	-	13
<i>Mtonga</i>	-	-	1	-
Tree density (per ha)	380	80	157	146
Species richness	21		42	

Vegetation plot 13 (recorded 25/6/2018)

Coordinates: S 6.69570° / E 31.60895° (white-marked *Erythrophleum africanum*)

Elevation: 1310 m.a.s.l.; slope: 1%, slope exposure: 245°

Dominant tree height: 18-20 m;

Vegetation cover: canopy (8-18/20m): 55%; understory (2-8m): 20%; herbaceous layer (0-2m): 15%

Herbaceous layer: *Adenodolichos punctatus* 1, *Hyparrhenia newtonii* 1, *Bothriochloa bladhii* 1, *Psychotria eminiana* 1, *Urelytrum digitatum* 1, *Tetracera masuiana* 1, *Zonetriche inamoena* 1

Photos: 5964, 5965, 5966, 5967

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Hexalobus monopetalus</i>	4,13,3,7,7,6,7,4,4,5,3,3,3,7 = 14	33,62,27/28,32/39,25,21, 29,37,40=9	20	8
<i>Diplorhynchus condylocarp.</i>	11,3,6/8,3/3,8/8,10/6,12,5/8 =8	-	57	1
<i>Hymenocardia acida</i>	3,3,3,3,4,3,5,3=8	-	43	1
<i>Julbernardia globiflora</i>	10,4,8,6,5,3,3=7	53=1	13	35
<i>Brachystegia spiciformis</i>	13,13,9,18=4	32,20,98=3	24	18
<i>Maprounea africana</i>	9,6,4,10,6,14,9=7	-	-	-
<i>Pseudolachnostylis mapr</i>	3,9,7,3,7,6,4=7	-	6	3
<i>Brachystegia utilis/manga</i>	14=1	24,21,51,32/10,14=5	-	-
<i>Terminalia kaiseriana</i>	19,15,9,4=4	-	23	12
<i>Uapaca nitida</i>	17/13,9,13=3	-	-	-
<i>Cassipourea mollis</i>	4,3,3=3	-	8	-
<i>Erythrophleum africanum</i>	3,9,15=3	-	46	9
<i>Maranthes floribunda</i>	12/9,3,7=3	-	-	-
<i>Parinari curatellifolia</i>	4/4,5,4=3	-	9	7
<i>Strychnos innocua</i>	4,5=2	-	14	-
<i>Albizia antunesiana</i>	14=1	-	-	-
<i>Bridelia duvigneaudii</i>	4=1	-	-	-
<i>Bobgunnia madagascar.</i>	12=1	-	9	-
<i>Combretum zeyheri</i>	4=1	-	3	-
<i>Dalbergia nitidula</i>	4=1	-	8	-
<i>Lannea schimperi</i>	4=1	-	15	3
<i>Margaritaria discoidea</i>	9=1	-	-	-
<i>Monanthes discolor</i>	3=1	-	-	-
<i>Oldfieldia dactylophylla</i>	5=1	-	10	1
<i>Securidaca longependuncul.</i>	5=1	-	-	-
<i>Vitex doniana</i>	3=1	-	4	14
<i>Azalia quanzensis</i>	-	-	1	-
<i>Albizia versicolor</i>	-	-	1	-
<i>Anisophyllea pomifera</i>	-	-	1	-
<i>Annona senegalensis</i>	-	-	4	-
<i>Borassus aethiopum</i>	-	-	1	-
<i>Brachystegia boehmii</i>	-	-	26	8
<i>Cassia abbreviata</i>	-	-	1	-

<i>Catunaregam spinosa</i>	-	-	1	-
<i>Combretum collinum</i>	-	-	-	6
<i>Combretum fragrans</i>	-	-	1	-
<i>Combretum molle</i>	-	-	6	-
<i>Mallotus oppositifolius?</i>	-	-	85	-
<i>Markhamia obtusifolia</i>	-	-	1	-
<i>Monanthes discolor</i>	-	-	15	-
<i>Garcinia huillensis</i>	-	-	1	-
<i>Pericopsis angolensis</i>	-	-	19	6
<i>Phyllanthus engleri</i>	-	-	3	-
<i>Pterocarpus angolensis</i>	-	-	1	8
<i>Pterocarpus tinctorius</i>	-	-	2	1
<i>Rothmannia engleriana</i>	-	-	4	-
<i>Schrebera trichoclada</i>	-	-	9	-
<i>Strychnos cocculoides</i>	-	-	2	-
<i>Strychnos sp.</i>	-	-	-	1
<i>Uapaca kirkiana</i>	-	-	4	-
<i>Vangueria madagascariens.</i>	-	-	1	-
<i>Vitex payos</i>	-	-	3	2
<i>Ximenia caffra</i>	-	-	1	-
<i>Ziziphus mucronata</i>	-	-	3	1
<i>Mtonga</i>	-	-	2	1
Tree density (per ha)	880	180	511	146
Species richness		26		46

Vegetation plot 14 (recorded 25/6/2018)

Coordinates: S 6.66932° / E 31.64857° (white-marked *Julbernardia globiflora*)

Elevation: 1375 m.a.s.l.; slope: +/- flat

Dominant tree height: 22 m;

Vegetation cover: canopy (8-22m): 40%; understory (2-8m): 15%; herbaceous layer (0-2m): 65%

Herbaceous layer: *Hyparrhenia newtonii* 2, *Indigofera hirsuta* 1, *eminiana* 1, *Tetracera masuiana* 1

Photos: 5968, 5969, 5970, 5971

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Julbernardia globiflora</i>	-	35,31,31,26,30,24/22,25,36=8	32	58
<i>Hexalobus monopetalus</i>	4/4,5,5,4,5,3,3=7	-	1	-
<i>Pseudolachnostylis mapr.</i>	12,14,15,8/10/4,8=5	-	20	11
<i>Erythrophleum africanum</i>	16/10,11,3=3	-	15	12
<i>Albizia gummifera</i>	14=1	41=1	-	-
<i>Anisophyllea pomifera</i>	3/5/9=1	41=1	1	10
<i>Brachystegia spiciformis</i>	-	26,23=2	68	53
<i>Diplorhynchus condylocarp.</i>	3,14/13=2	-	29	-
<i>Combretum zeyheri</i>	4/11,5=2	-	-	-
<i>Brachystegia glaucescens</i>	15/5=1	22=1	8	7
<i>Combretum collinum</i>	13=1	-	2	2
<i>Dalbergia nitidula</i>	12=1	-	10	-
<i>Elaeodendron schweinfurth.</i>	8=1	-	-	-
<i>Lonchocapus capassa</i>	3=1	-	-	-
<i>Terminalia kaiseriana</i>	16=1	-	1	-
<i>Albizia versicolor</i>	-	-	2	-
<i>Bobgunnia madagascar.</i>	-	-	1	-
<i>Burkea africana</i>	-	-	1	-

<i>Cassipourea mollis</i>	-	-	1	-
<i>Garcinia huillensis</i>	-	-	1	-
<i>Isoberlinia angolensis</i>	-	-	4	-
<i>Lannea schimperi</i>	-	-	1	5
<i>Mallotus oppositifolius?</i>	-	-	6	-
<i>Monanthes discolor</i>	-	-	1	-
<i>Ochna holstii</i>	-	-	30	16
<i>Oldfieldia dactylophylla</i>	-	-	2	-
<i>Parinari curatellifolia</i>	-	-	1	3
<i>Phyllanthus engleri</i>	-	-	4	-
<i>Phyllocosmus leimareanus</i>	-	-	1	-
<i>Protea madiensis</i>	-	-	11	2
<i>Pterocarpus angolensis</i>	-	-	5	4
<i>Pterocarpus tinctorius</i>	-	-	5	-
<i>Schrebera trichoclada</i>	-	-	4	-
<i>Strychnos cocculoides</i>	-	-	8	-
<i>Vitex doniana</i>	-	-	-	1
<i>Vitex payos</i>	-	-	8	-
<i>Ximenia caffra</i>	-	-	15	3
<i>Mkalya</i>	-	-	2	-
<i>Mtonga</i>	-	-	2	-
Tree density (per ha)	270	130	303	187
Species richness		15		35

Vegetation plot 15 (recorded 25/6/2018)

Coordinates: S 6.63017° / E 31.95254° (white-marked *Pterocarpus angolensis*, *Brachystegia spiciformis?*)

Elevation: 1245 m.a.s.l.; slope: 1-2%, slope exposure: 10°

Dominant tree height: 18(20) m;

Vegetation cover: canopy (10-18/20m): 35%; understorey (2-10m): 25%; herbaceous layer (0-2m): 65%

Herbaceous layer: *Hyparrhenia newtonii* 2-3, *Tristachya superba* 1-2, *Combretum molle* 1

Photos: 5992, 5993, 5994, 5995

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Julbernardia globiflora</i>	5,5,10,10,6,4,19=7	36,38,29,41=4	59	35
<i>Diplorhynchus condylocarp.</i>	11/15,6,10,17,7,5,3,7=8	-	14	5
<i>Brachystegia spiciformis</i>	11,11,11,11,5,10,4=7	39,31,34=3	45	10
<i>Rothmannia engleriana</i>	4,5,5,4=4	-	1	-
<i>Combretum molle</i>	18,7,11=3	-	-	1
<i>Crossopteryx febrifuga</i>	11, 8,17=3	-	8	1
<i>Pterocarpus angolensis</i>	7,17=2	20=1	14	12
<i>Ximenia americana</i>	9,9,12=3	-	-	-
<i>Combretum zeyheri</i>	8,11=2	-	3	2
<i>Dalbergia nitidula</i>	9,6=2	-	2	12
<i>Oldfieldia dactylophylla</i>	4,10=2	-	1	-
<i>Pericopsis angolensis</i>	15,11=2	-	8	4
<i>Pseudolachnostylis mapr.</i>	10,3=2	-	16	-
<i>Strychnos spinosa</i>	5,6=2	-	1	-
<i>Monotes katangensis</i>	28/27=1	-	7	3
<i>Brachystegia glaucescens</i>	8=1	-	11	20
<i>Burkea africana</i>	8=1	-	-	-

<i>Cassipourea mollis</i>	6=1	-	1	-
<i>Combretum collinum</i>	6=1	-	3	1
<i>Dichrostachys cinerea</i>	5/4=1	-	4	-
<i>Hexalobus monopetalus</i>	9=1	-	11	3
<i>Catunaregam spinosa</i>	3=1	-	1	-
<i>Erythrophleum africanum</i>	10=1	-	4	1
<i>Lannea schimperi</i>	13=1	-	5	2
<i>Parinari curatellifolia</i>	5=1	-	10	7
<i>Pterocarpus tinctorius</i>	5=1	-	1	2
<i>Terminalia kaiseriana</i>	8=1	-	14	2
<i>Afzelia quanzensis</i>	-	-	-	1
<i>Albizia versicolor</i>	-	-	1	-
<i>Bobgunnia madagascariens.</i>	-	-	6	1
<i>Commiphora africana</i>	-	-	1	-
<i>Flacourtia indica</i>	-	-	1	-
<i>Mallotus oppositifolius?</i>	-	-	12	-
<i>Schrebera trichoclada</i>	-	-	1	-
<i>Strychnos cocculoides</i>	-	-	1	-
<i>Strychnos innocua</i>	-	-	9	1
<i>Monotes engleri?</i>	-	-	-	4
<i>Pericopsis angolensis</i>	-	-	8	4
<i>Phyllanthus engleri</i>	-	-	1	-
<i>Tamarindus indica</i>	-	-	1	-
<i>Ximenia caffra</i>	-	-	4	-
<i>Mkalya</i>	-	-	1	-
<i>Mtonga</i>	-	-	7	1
Tree density (per ha)	640	80	298	135
Species richness		27		38

Vegetation plot 16 (recorded 28/6/2018)

Coordinates: S 6.67304° / E 31.94294° (white-marked *Bobgunnia madagascar.*)

Elevation: 1205 m.a.s.l.; slope: 0-1%, slope exposure: 30%

Dominant tree height: 15 m;

Vegetation cover: canopy (8-15m): 30%; understory (2-8m): 25%; herbaceous layer (0-2m): 55%

Herbaceous layer: *Hyparrhenia newtonii* 2, *Julbernardia globiflora* 1-2, *Mundulea sericea* 1-2

Photos: 5996, 5997, 5998, 5999

Species	2018 (0.1 ha)		2004 (0.25 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Julbernardia globiflora</i>	8,4,10,4,10,5/7,4,4,9,9,4,4,5,10,6=15	22=1	6	5
<i>Diplorhynchus condylocarp.</i>	2,10/4,4,7,12,5,14,7,15,5=10	6/3/28=1	51	3
<i>Erythrophleum africanum</i>	8,3,6,5,3,4,5,4,3,6,6=11	-	8	2
<i>Strychnos pungens</i>	10,17,10,11=4	24,22,23=3	-	-
<i>Brachystegia glaucescens</i>	17,10,10/15,9,14/13=5	25=1	1	6
<i>Burkea africana</i>	16,9,14,5=4	-	5	-
<i>Pterocarpus angolensis</i>	16,6,17,7=4	22=1	-	1
<i>Bobgunnia madagascar.</i>	5,17,17=3	-	5	-
<i>Brachystegia spiciformis</i>	13,4=2	-	-	3
<i>Flacourtia indica</i>	5,4=2	-	8	-
<i>Maprounea africana</i>	10,10=2	-	-	-
<i>Monanthes discolor</i>	4,4=2	-	-	-
<i>Ochna oxyphylla</i>	7,10=2	-	-	-

<i>Terminalia kaiseriana</i>	-	28/7,22/6=2	1	-
<i>Brachystegia stipulata?</i>	3=1	-	-	-
<i>Bridelia scleroneura</i>	9=1	-	-	-
<i>Afzelia quanzensis</i>	-	24/23=1	-	-
<i>Dalbergia nitidula</i>	13=1	-	1	-
<i>Dichrostachys cinerea</i>	7=1	-	-	-
<i>Hymenocardia acida</i>	3=1	-	6	-
<i>Monotes kantangensi</i>	3=1	-	-	-
<i>Pseudolachnostylis mapr.</i>	15=1	-	3	3
<i>Terminalia mollis</i>	7=1	-	-	-
<i>Vitex payos</i>	10=1	-	2	-
<i>Brachystegia boehmii</i>	-	-	3	1
<i>Bauhinia thonningii</i>	-	-	-	1
<i>Combretum collinum</i>	-	-	1	-
<i>Combretum fragrans</i>	-	-	3	2
<i>Combretum zeyheri</i>	-	-	1	-
<i>Commiphora africana</i>	-	-	-	2
<i>Diospyros cornii</i>	-	-	2	-
<i>Hexalobus monopetalus</i>	-	-	1	-
<i>Holarrhena pubescens</i>	-	-	3	-
<i>Isoberlinia angolensis</i>	-	-	-	1
<i>Kigelia africana</i>	-	-	-	1
<i>Lannea schimperi</i>	-	-	-	1
<i>Mallotus oppositifolius?</i>	-	-	2	-
<i>Monotes engleri?</i>	-	-	-	2
<i>Oldfieldia dactylophylla</i>	-	-	3	-
<i>Ozoroa insignis</i>	-	-	1	-
<i>Parinari curatellifolia</i>	-	-	2	3
<i>Protea madiensis</i>	-	-	3	-
<i>Rothmannia engleriana</i>	-	-	4	-
<i>Securidaca longependuncul.</i>	-	-	1	-
<i>Strychnos cocculoides</i>	-	-	3	6
<i>Strychnos spinosa</i>	-	-	3	-
<i>Kaulwampako</i>	-	-	-	1
Tree density/0.25 ha			133	44
Tree density/ha	750	100	532	176
Species richness		24		37

Vegetation plot 17 (recorded 28/6/2018)

Coordinates: S 6.70926° / E 31.93098° (white-marked *Pterocarpus angolensis*);

Location: Ulaya

Elevation: 1205 m.a.s.l.; slope: 0-2%, slope exposure: 220°

Dominant tree height: 16 m;

Vegetation cover: canopy (8-16 m): 30%; understory (2-8m): 15%; herbaceous layer (0-2m): 75%

Herbaceous layer: *Hyparrhenia newtonii* 3, *Combretum molle* 1

Photos: 6000, 6001, 6002, 6003

Remark: Along the border plot *Combretum molle* (5) and *Pseudolachnostylis maprounefolia* (1) cut for poles; 1 large termitaria (*Macrotermes*)

Species	2018 (0.1 ha)		2004 (0.25 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Terminalia kaiseriana</i>	3,5,4/10,8,3,5,6,11,3,3/5,3 =11	-	6	-
<i>Brachystegia stipulata?</i>	12,9,14,8,7=5	22=1	-	1

<i>Pseudolachnostylis mapr.</i>	12,3,19,8/13,10=5	23,23,23=3	-	2
<i>Maranthes floribunda</i>	8=1	29/18,31=2	-	-
<i>Combretum fragrans</i>	3,18=2	9/23=1	6	8
<i>Julbernardia globiflora</i>	-	30,30,35=3	-	1
<i>Bauhinia thonningii</i>	8/5,11=2	-	-	-
<i>Brachystegia glaucescens</i>	8/12,9=2	-	-	1
<i>Maytenus senegalensis</i>	4/3,3=2	-	-	-
<i>Bauhinia petersiana</i>	10=1	-	-	-
<i>Catunaregam spinosa</i>	3/3=1	-	2	-
<i>Combretum molle</i>	15=1	-	-	-
<i>Dichrostachys cinerea</i>	4/3=1	-	-	-
<i>Diplorhynchus condylocarp.</i>	10=1	-	4	2
<i>Ekebergia capensis</i>	4=1	-	-	-
<i>Pterocarpus tinctorius</i>	-	31=1	-	-
<i>Terminalia mollis</i>	10=1	-	-	-
<i>Uapaca kirkii</i>	8/14=1	-	-	-
<i>Vangueria madagascariens.</i>	14=1	-	-	-
<i>Ziziphus mucronata</i>	14/3=1	-	-	-
<i>Acacia polyacantha</i>	-	-	-	2
<i>Combretum psidioides</i>	-	-	5	3
<i>Commiphora africana</i>	-	-	1	-
<i>Lannea schimperi</i>	-	-	-	1
<i>Parinari curatellifolia</i>	-	-	8	-
<i>Pericopsis angolensis</i>	-	-	-	1
<i>Phyllanthus engleri</i>	-	-	4	-
<i>Schreberia trichoclada</i>	-	-	3	-
<i>Stereospermum kunthianum</i>	-	-	1	-
<i>Ximenia caffra</i>	-	-	2	-
Tree density/0.25 ha			42	22
Tree density/ha	400	110	168	88
Species richness		20		18

Vegetation plot 21 (recorded 24/6/2018)

Coordinates: S 6.72350° / E 31.74830° (white-marked *Pterocarpus angolensis*)

Location: Kikusi area

Elevation: 1500 m.a.s.l.; slope: +/- flat

Dominant tree height: 10(12) m;

Vegetation cover: canopy (6-10{12}m): 30%; understorey (2-6m): 20%; herbaceous layer (0-2m): 15%

Herbaceous layer: *Antheophora elongata* 1, *Andropogon schirensis* 1, *Zonetriche inamoena* 1

Photos: 5943, 5944, 5945, 5946

Remark: Several *Pterocarpus angolensi* debarked, two of them in vegetation plot

Species	2018 (0.1 ha)		2004 (1 ha)	
	DBH < 20 cm	DBH ≥ 20 cm	DBH < 20 cm	DBH ≥ 20 cm
<i>Julbernardia globiflora</i>	4,9,5,5,5,11,10,10/13,5,12,3,12,12/13,5,9,8,7,5,10,9,8,11,3,10,4,6,3,7,3,12,7,7,9,11,3,9,7,6,5,4,7,3,10,9/5,4,14,12,4,10,10,3,10,13/7,5,10,3,7,6/7=58	43,32=2	19	3
<i>Pterocarpus angolensis</i>	12/15/13,13/12,10/7,10,10/7/8,8/7,13,3,13,7,9,14,8,8,11,6,10/10/17,19=18	6/25/7,15/26/9,44=3	27	-
<i>Monotes katangensi</i>	5,6,3,3,3,3,6/6,6,4,3,9,3,	-	-	-

	3/5,4,5,11,16/17,4,4,7,11, 10=12			
<i>Parinari curatellifolia</i>	6,6,3,5,3,10=6	-	14	1
<i>Rothmannia engleriana</i>	4,3,5,4,3,3=6	-	3	-
<i>Albizia antunesiana</i>	5,3,3,6,4=5	-	4	-
<i>Ochna afzelii</i> ssp. <i>afzelii</i>	4,5,8/7/7,3,6=5		2	-
<i>Diplorhynchus condylocarp.</i>	3,10,7=3	-	-	-
<i>Erythrophleum africanum</i>	8,17/7=2	26=1	-	-
<i>Lannea schimperi</i>	3,9=2	-	1	-
<i>Anisophyllea pomifera</i>	4=1	-	2	-
<i>Brachystegia spiciformis</i>	7=1	-	1	1
<i>Combretum molle</i>	7=1	-	7	1
<i>Hexalobus monopetalus</i>	8=1	-	8	3
<i>Strychnos pungens</i>	5=1	-	-	-
<i>Multidentia crassa</i>	9/6=1	-	-	-
<i>Cassipourea mollis</i>	-	-	3	-
<i>Combretum psidioides</i>	-	-	2	-
<i>Dalbergia nitidula</i>	-	-	3	-
<i>Garcinia huillensis</i>	-	-	-	1
<i>Monanthes discolor</i>	-	-	4	-
<i>Monotes engleri?</i>	-	-	19	15
<i>Ximenia caffra</i>	-	-	5	-
Tree density/0.25 ha			124	25
Tree density/ha	1230	60	496	100
Species richness		16		18

Appendix B: Vegetation transects

Transect 1: Upper land (above escarpment)

Starting point road: S 6°80616 / E 31°66380; azimuth: 47° (towards vegetation plot 21)

Sampling point 1:

Coordinates: S 6°80492 / E 31°66522

Slope: 5%, slope exposure: 110°

Dominant tree height: 11 m

Basal area (Bitterlich, k=1): 10 m²

Photos: 6004, 6005, 6006, 6007

Disturbances/notes: stony blocks (boulders)

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia microphylla</i>	22	6.80
	<i>Pterocarpus angolensis</i>	24	20.90
	<i>Pseudolachnostylis maprouneifolia</i>	26	26.50
	<i>Combretum molle</i>	25	26.20
DBH < 20 cm	<i>Vitex payos</i>	12	4.05
	<i>Parinari curatellifolia</i>	5	4.00
	<i>Combretum collinum</i>	8	2.00
	<i>Strychnos innocua</i>	5	2.24

Sampling point 2:

Coordinates: S 6°80370 / E 31°66665

Slope: 8%, slope exposure: 80°

Dominant tree height: 22 m

Basal area (Bitterlich, k=1): 16 m²

Photos: 6008, 6009, 6010, 6011

Disturbances/notes (2-3): old traditional bee hive on the ground (290 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Parinari curatellifolia</i>	23	6.84
	<i>Brachystegia microphylla</i>	21	6.00
	<i>Julbernardia globiflora</i>	24	9.11
	<i>Parinari curatellifolia</i>	37	13.11
DBH < 20 cm	<i>Parinari curatellifolia</i>	6	2.41
	<i>Uapaca kirkiana</i>	14	3.60
	<i>Julbernardia globiflora</i>	7	4.45
	<i>Brachystegia microphylla</i>	15	2.65

Sampling point 3:

Coordinates: S 6°80225 / E 31°66787

Slope: 3-4%, slope exposure: 340°

Dominant tree height: 20 m

Basal area (Bitterlich, k=1): 14 m²

Photos: 6012, 6013, 6014, 6015

Disturbances/notes (3-4): beekeepers camp (30 steps); 1 *Pterocarpus a. cut* (>10 yrs) (75 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus angolensis</i>	38	27.16
	<i>Pseudolachnostylis maprouneifolia</i>	21	2.60
	<i>Pericopsis angolensis</i>	38	5.58
	<i>Brachystegia microphylla</i>	30	6.51
DBH < 20 cm	<i>Hexalobus monopetalus</i>	5	5.50
	<i>Pseudolachnostylis maprouneifolia</i>	13	2.16
	<i>Hexalobus monopetalus</i>	5	3.15
	<i>Hexalobus monopetalus</i>	3	13.88

Sampling point 4:

Coordinates: S 6°80085 / E 31°66928

Slope: +/- flat, slope exposure: 335°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 10.5 m²

Photos: 6016, 6017, 6018, 6019

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Parinari curatellifolia</i>	21	13.56
	<i>Brachystegia utilis</i>	37	5.55
	<i>Brachystegia utilis</i>	33	3.15
	<i>Brachystegia glaucescens</i>	21	16.65
DBH < 20 cm	<i>Pterocarpus angolensis</i>	6	7.91
	<i>Parinari curatellifolia</i>	19	7.76
	<i>Uapaca kirkiana</i>	9	8.77
	<i>Uapaca kirkiana</i>	9	6.96

Sampling point 5:

Coordinates: S 6°79929 / E 31°67060

Slope: 3-4%, slope exposure: 320°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 9 m²

Photos: 6020, 6021, 6022, 6023

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	46	8.45
	<i>Brachystegia utilis</i>	36	16.24
	<i>Parinari curatellifolia</i>	41	11.73
	<i>Parinari curatellifolia</i>	62	8.56
DBH < 20 cm	<i>Phyllocosmus leimareanus</i>	12	5.08
	<i>Brachystegia utilis</i>	5	4.70
	<i>Pterocarpus angolensis</i>	16	3.55
	<i>Uapaca kirkiana</i>	5	2.08

Sampling point 6:

Coordinates: S 6°79778 / E 31°67186

Slope: 3-4%, slope exposure: 360°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 10 m²

Photos: 6024, 6025, 6026, 6027

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	20	15.85
	<i>Brachystegia utilis</i>	59	12.95
	<i>Vitex doniana</i>	35	8.00
	<i>Brachystegia utilis</i>	32	13.40
DBH < 20 cm	<i>Bobgunnia madagascariensis</i>	15	10.10
	<i>Pterocarpus angolensis</i>	3	3.51
	<i>Diplorhynchus condylocarpon</i>	5	10.15
	<i>Brachystegia utilis</i>	4	2.35

Sampling point 7:

Coordinates: S 6°79645 / E 31°67337

Slope: 3-4%, slope exposure: 360°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 13 m²

Photos: 6028, 6029, 6030, 6031

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	33	9.21
	<i>Pseudolachnostylis maprouneifolia</i>	32	4.70
	<i>Julbernardia globiflora</i>	25	8.85
	<i>Julbernardia globiflora</i>	29	7.70
DBH < 20 cm	<i>Brachystegia glaucescens</i>	5	5.30
	<i>Brachystegia glaucescens</i>	15	8.88
	<i>Burkea africana</i>	3	5.61
	<i>Diplorhynchus condylocarpon</i>	5	1.04

Sampling point 8:

Coordinates: S 6°79527 / E 31°67500

Slope: 2-3%, slope exposure: 360°

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 13 m²

Photos: 6032, 6033, 6034, 6035

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia utilis</i>	24	11.57
	<i>Uapaca nitida</i>	21	13.80
	<i>Bobgunnia madagascariensis</i>	22	13.51
	<i>Julbernardia globiflora</i>	43	9.82
DBH < 20 cm	<i>Uapaca nitida</i>	8	2.03
	<i>Julbernardia globiflora</i>	3	4.21
	<i>Bobgunnia madagascariensis</i>	10	1.86
	<i>Pseudolachnostylis maprouneifolia</i>	3	6.06

Sampling point 9:

Coordinates: S 6°79413 / E 31°67652

Slope: 1-2%, slope exposure: 340°

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 7 m²

Photos: 6036, 6037, 6038, 6039

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Monotes katangensis</i>	22	13.89
	<i>Brachystegia glaucescens</i>	22	20.15
	<i>Uapaca kirkiana</i>	27	11.40
	<i>Brachystegia utilis</i>	21	25.75
DBH < 20 cm	<i>Albizia antunesiana</i>	11	1.50
	<i>Pterocarpus angolensis</i>	14	3.31
	<i>Brachystegia glaucescens</i>	12	2.38
	<i>Pterocarpus angolensis</i>	5	5.32

Sampling point 10:

Coordinates: S 6°79270 / E 31°67792

Slope: 3-4%, slope exposure: 330°

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 13.5 m²

Photos: 6040, 6041, 6042, 6043

Disturbances/notes: * 1 *Monotes katangensis* recorded cut for pole

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Albizia antunesiana</i>	52	15.30
	<i>Brachystegia glaucescens</i>	27	6.50
	<i>Pterocarpus angolensis</i>	20	13.98
	<i>Pterocarpus angolensis</i>	30	8.97
DBH < 20 cm	<i>Monotes katangensis</i>	9	0.70
	<i>Brachystegia glaucescens</i>	5	4.21
	* <i>Monotes katangensis</i>	10	2.35
	<i>Monotes katangensis</i>	18	5.75

Sampling point 11:

Coordinates: S 6°79131 / E 31°67926

Slope: +/- 1%, slope exposure: 320°

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): 9 m²

Photos: 6044, 6045, 6046, 6047

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia utilis</i>	70	9.38
	<i>Combretum molle</i>	24	10.00
	<i>Brachystegia utilis</i>	41	4.91
	<i>Brachystegia utilis</i>	24	11.42
DBH < 20 cm	<i>Terminalia mollis</i>	14	10.99
	<i>Terminalia kaiseriana</i>	8	9.52
	<i>Diplorhynchus condylocarpon</i>	3	1.05
	<i>Terminalia kaiseriana</i>	10	5.21

Sampling point 12:

Coordinates: S 6°78970 / E 31°68052

Slope: 1-2%, slope exposure: 310°

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 6 m²

Photos: 6048, 6049, 6050, 6051

Disturbances/notes (12 – 13): 1 *Pterocarpus angolensis* cut (>10 yrs) (10 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	21	10.76
	<i>Erythrina abyssinica</i>	75	8.93
	<i>Combretum molle</i>	23	11.20
	<i>Ziziphus mucronata</i>	24	12.82
DBH < 20 cm	<i>Brachystegia glaucescens</i>	8	10.49
	<i>Annona senegalensis</i>	8	8.23
	<i>Combretum molle</i>	7	1.02
	<i>Azanza garckeana</i>	7	3.70

Sampling point 13:

Coordinates: S 6°79801 / E 31°68150

Slope: 3%, slope exposure: 280°

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 15 m²

Photos: 6052, 6053, 6054, 6055

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Erythrophleum africanum</i>	21	10.59
	<i>Brachystegia spiciformis</i>	20	5.13
	<i>Erythrophleum africanum</i>	33	5.49
	<i>Brachystegia spiciformis</i>	40	8.65
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	5	3.01
	<i>Brachystegia glaucescens</i>	3	4.62
	<i>Terminalia mollis</i>	8	5.16
	<i>Terminalia kaiseriana</i>	7	4.81

Sampling point 14:

Coordinates: S 6°78626 / E 31°68255

Slope: 1-2%, slope exposure: 330°

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 15 m²

Photos: 6056, 6057, 6058, 6059

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	36	9.60
	<i>Brachystegia spiciformis</i>	75	16.90
	<i>Brachystegia spiciformis</i>	22	15.85
	<i>Monanthes discolor</i>	27	2.47
DBH < 20 cm	<i>Vitex doniana</i>	5	4.40
	<i>Combretum collinum</i>	7	7.68
	<i>Brachystegia spiciformis</i>	6	2.31
	<i>Brachystegia glaucescens</i>	5	1.92

Sampling point 15:

Coordinates: S 6°78486 / E 31°68393

Slope: 0-1%, slope exposure: 290°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 8 m²

Photos: 6060, 6061, 6062, 6063

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Vitex doniana</i>	46	3.60
	<i>Pseudolachnostylis maprouneifolia</i>	20	8.84
	<i>Julbernardia globiflora</i>	42	4.35
	<i>Brachystegia spiciformis</i>	38	10.65
DBH < 20 cm	<i>Oldfieldia dactylophylla</i>	10	3.95
	<i>Oldfieldia dactylophylla</i>	4	11.92
	<i>Vitex doniana</i>	4	10.30
	<i>Oldfieldia dactylophylla</i>	17	7.07

Sampling point 16:

Coordinates: S 6°78355 / E 31°68534

Slope: +/- 1%, slope exposure: 320°

Dominant tree height: 12 m

Basal area (Bitterlich, k=1): 7 m²

Photos: 6064, 6065, 6066, 6067

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus angolensis</i>	21	10.93
	<i>Pericopsis angolensis</i>	21	7.85
	<i>Kigelia africana</i>	35	18.10
	<i>Phyllanthus engleri</i>	45	19.40
DBH < 20 cm	<i>Lonchocarpus capassa</i>	3	2.00
	<i>Pterocarpus angolensis</i>	8	1.56
	<i>Pterocarpus angolensis</i>	8	2.18
	<i>Lonchocarpus capassa</i>	5	1.12

Sampling point 17:

Coordinates: S 6°78227 / E 31°68687

Slope: +/- 1%, slope exposure: 320°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 9.5 m²

Photos: 6068, 6069, 6070, 6071

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Ochna holstii</i>	22	3.44
	<i>Combretum collinum</i>	21	11.04
	<i>Erythrophleum africanum</i>	24	18.59
	<i>Pericopsis angolensis</i>	33	15.20
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	15	9.05
	<i>Pseudolachnostylis maprouneifolia</i>	4	8.10
	<i>Pseudolachnostylis maprouneifolia</i>	5	8.63
	<i>Terminalia kaiseriana</i>	11	5.49

Sampling point 18:

Coordinates: S 6°78082 / E 31°68813

Slope: +/- 1%, slope exposure: 300°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 18 m²

Photos: 6072, 6073, 6074, 6075

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	55	8.80
	<i>Brachystegia spiciformis</i>	21	6.50
	<i>Strychnos innocua</i>	23	8.00
	<i>Pterocarpus angolensis</i>	23	3.97
DBH < 20 cm	<i>Oldfieldia dactylophylla</i>	7	2.08
	<i>Oldfieldia dactylophylla</i>	10	3.59
	<i>Oldfieldia dactylophylla</i>	13	3.50
	<i>Combretum collinum</i>	14	2.01

Sampling point 19:

Coordinates: S 6°77945 / E 31°68953

Slope: +/- 1%, slope exposure: 260°

Dominant tree height: 24 m

Basal area (Bitterlich, k=1): 12 m²

Photos: 6076, 6077, 6078, 6079

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	53	3.85
	<i>Mystroxydon aethiopicum</i>	21	9.75
	<i>Strychnos innocua</i>	26	11.89
	<i>Combretum molle</i>	30	14.48
DBH < 20 cm	<i>Monanthes discolor</i>	3	1.72
	<i>Pterocarpus angolensis</i>	4	1.08
	<i>Pterocarpus angolensis</i>	13	2.41
	<i>Pterocarpus angolensis</i>	3	2.06

Sampling point 20:

Coordinates: S 6°77808 / E 31°69095

Slope: 1-2%, slope exposure: 280°

Dominant tree height: 22 m

Basal area (Bitterlich, k=1): 11 m²

Photos: 6080, 6081, 6082, 6083

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Erythrophleum africanum</i>	33	11.43
	<i>Erythrophleum africanum</i>	37	14.14
	<i>Brachystegia spiciformis</i>	46	3.85
	<i>Erythrophleum africanum</i>	40	11.17
DBH < 20 cm	<i>Markhamia obtusifolia</i>	7	1.80
	<i>Brachystegia spiciformis</i>	3	2.66
	<i>Albizia antunesiana</i>	8	2.03
	<i>Hexalobus monopetalus</i>	8	7.62

Sampling point 21:

Coordinates: S 6°77674 / E 31°69236

Slope: 1-2%, slope exposure: 280°

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 13 m²

Photos: no photographs

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Maranthes floribunda</i>	56	3.43
	<i>Olax obtusifolia</i>	25	12.22
	<i>Brachystegia spiciformis</i>	37	6.32
	<i>Brachystegia spiciformis</i>	39	3.91
DBH < 20 cm	<i>Lannea schimperi</i>	17	4.15
	<i>Hexalobus monopetalus</i>	5	2.69
	<i>Julbernardia globiflora</i>	12	2.80
	<i>Albizia antunesiana</i>	6	11.28

Sampling point 22:

Coordinates: S 6°77529 / E 31°69374

Slope: +/- flat

Dominant tree height: 12 m

Basal area (Bitterlich, k=1): 8 m²

Photos: 6085, 6086, 6087, 6088

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Parinari curatellifolia</i>	40	15.45
	<i>Anisophyllea pomifera</i>	41	11.80
	<i>Phyllocosmus leimareanus</i>	21	8.45
	<i>Brachystegia utilis</i>	43	9.90
DBH < 20 cm	<i>Brachystegia spiciformis</i>	5	3.58
	<i>Erythrophleum africanum</i>	3	5.56
	<i>Erythrophleum africanum</i>	7	4.40
	<i>Brachystegia spiciformis</i>	6	3.96

Sampling point 23:

Coordinates: S 6°77376 / E 31°69503

Slope: +/- flat

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 13.5 m²

Photos: 6089, 6090, 6091, 6092

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	39	10.62
	<i>Parinari curatellifolia</i>	31	12.34
	<i>Anisophyllea pomifera</i>	25	8.57
	<i>Brachystegia spiciformis</i>	31	3.92
DBH < 20 cm	<i>Phyllocosmus leimareanus</i>	4	12.02
	<i>Phyllocosmus leimareanus</i>	16	7.01
	<i>Hexalobus monopetalus</i>	3	2.90
	<i>Combretum molle</i>	3	9.29

Sampling point 24:

Coordinates: S 6°77249 / E 31°69654

Slope: +/- flat

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 7 m²

Photos: 6093, 6094, 6095, 6096

Disturbances/notes: –

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Maranthes floribunda</i>	34	10.10
	<i>Erythrophleum africanum</i>	25	4.40
	<i>Erythrophleum africanum</i>	22	7.78
	<i>Brachystegia spiciformis</i>	47	9.49
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	3	2.63
	<i>Albizia antunesiana</i>	3	2.05
	<i>Multidentia crassa</i>	3	12.71
	<i>Diplorhynchus condylocarpon</i>	4	3.29

Sampling point 25:

Coordinates: S 6°77094 / E 31°69788

Slope: 0-1%, slope exposure: 300°

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 5.5 m²

Photos: 6097, 6098, 6099, 6100

Disturbances/notes: 1 *Pterocarpus angolensis* cut for wild honey harvesting (4 yrs) (130 steps)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Musa</i>	47	14.35
	<i>Maranthes floribunda</i>	43	3.98
	<i>Julbernardia globiflora</i>	34	16.69
	<i>Parinari curatellifolia</i>	23	11.40
DBH < 20 cm	<i>Chrysophyllum bangweolense</i>	4	4.29
	<i>Ximenia americana</i>	10	10.40
	<i>Memecylon flavovirens</i>	3	5.53
	<i>Hexalobus monopetalus</i>	5	8.42

Sampling point 26:

Coordinates: S 6°76946 / E 31°69907

Slope: +/- 1%, slope exposure: 290°

Dominant tree height: 20 m

Basal area (Bitterlich, k=1): 9 m²

Photos: 6101, 6102, 6103, 6104

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Anisophyllea pomifera</i>	21	13.10
	<i>Parinari curatellifolia</i>	29	4.09
	<i>Maranthes floribunda</i>	36	6.12
	<i>Phyllocosmus leimareanus</i>	35	3.66
DBH < 20 cm	<i>Bobgunnia madagascariensis</i>	3	7.09
	<i>Julbernardia globiflora</i>	8	5.68
	<i>Brachystegia glaucescens</i>	6	2.07
	<i>Erythrophleum africanum</i>	3	9.09

Sampling point 27:

Coordinates: S 6°76817 / E 31°70052

Slope: +/- flat

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 14 m²

Photos: 6105, 6106, 6107, 6108

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	40	5.53
	<i>Parinari curatellifolia</i>	23	11.59
	<i>Julbernardia globiflora</i>	36	15.58
	<i>Brachystegia spiciformis</i>	44	17.30
DBH < 20 cm	<i>Brachystegia spiciformis</i>	8	1.32
	<i>Strychnos spinosa</i>	3	2.11
	<i>Brachystegia spiciformis</i>	5	2.42
	<i>Brachystegia spiciformis</i>	8	3.16

Sampling point 28 (28 – 50 Lucile)

Coordinates: S 6°76632 / E 31°70142
Slope: not recorded, slope exposure: not recorded
Dominant tree height: 8-10m
Basal area (Bitterlich, k=1): not recorded
Photos: 4112 / 4113 / 4114 / 4115
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Anisophyllea pomifera</i>	27	22.6
	<i>Brachystegia manga</i>	45	13.32
	<i>Brachystegia spiciformis</i>	42	18.10
	<i>Brachystegia spiciformis</i>	76	10.00
DBH < 20 cm	<i>Parinari curatellifolia</i>	12	4.35
	<i>Julbernardia globiflora</i>	3	1.78
	<i>Brachystegia manga</i>	10	2.23
	<i>Parinari curatellifolia</i>	4	3.15

Sampling point 29:

Coordinates: S 6°76474 / E 31°70244
Slope: not recorded, slope exposure: not recorded
Dominant tree height: 8-10 m
Basal area (Bitterlich, k=1): not recorded
Photos: 4116 / 4117 / 4118 / 4119
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Anisophyllea pomifera</i>	25	12.00
	<i>Anisophyllea pomifera</i>	31	16.96
	<i>Pericopsis angolensis</i>	35	3.63
	<i>Pericopsis angolensis</i>	32	16.39
DBH < 20 cm	<i>Julbernardia globiflora</i>	6	0.59
	<i>Brachystegia spiciformis</i>	8	1.28
	<i>Brachystegia glaucescens</i>	6	6.39
	<i>Pseudolachnostylis maprouneifolia</i>	6	3.75

Sampling point 30:

Coordinates: S 6°76314 / E 31°70400
Slope: not recorded, slope exposure: not recorded
Dominant tree height: 10 m
Basal area (Bitterlich, k=1): not recorded
Photos: 4120 / 4121 / 4122 / 4123
Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	46	2.51
	<i>Parinari curatellifolia</i>	36	10.50
	<i>Brachystegia spiciformis</i>	48	7.05
	<i>Brachystegia spiciformis</i>	39	11.10
DBH < 20 cm	<i>Memecylon flavovirens</i>	4	2.00
	<i>Parinari curatellifolia</i>	4	3.24
	<i>Pseudolachnostylis maprouneifolia</i>	13	5.75
	<i>Garcinia huillensis</i>	18	5.25

Sampling point 31:

Coordinates: S 6°76177 / E 31°70546
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 10 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4124 / 4125 / 4126 / 4127
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	60	19
	<i>Brachystegia spiciformis</i>	35	19.50
	<i>Brachystegia spiciformis</i>	48	11.35
	<i>Pseudolachnostylis maprouneifolia</i>	33	8.85
DBH < 20 cm	<i>Albizia antunesiana</i>	13	6.35
	<i>Pterocarpus angolensis</i>	11	0.83
	<i>Garcinia huillensis</i>	4	3.4
	<i>Monanthes discolor</i>	4	1.22

Sampling point 32:

Coordinates: S 6°76314 / E 31°70400
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 10 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4128 / 4129 / 4130 / 4131
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Phyllocosmus leimareanus</i>	31	11.34
	<i>Erythrophleum africanum</i>	27	10.52
	<i>Erythrophleum africanum</i>	28	8.45
	<i>Brachystegia manga</i>	23	13.75
DBH < 20 cm	<i>Brachystegia spiciformis</i>	4	1.40
	<i>Brachystegia spiciformis</i>	8	1.27
	<i>Erythrophleum africanum</i>	10	2.20
	<i>Brachystegia spiciformis</i>	6	1.60

Sampling point 33:

Coordinates: S 6°75852 / E 31°70751
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 10 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4132 / 4133 / 4134 / 4135
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	37	9.84
	<i>Brachystegia spiciformis</i>	41	16.95
	<i>Hexalobus monopetalus</i>	39	14.70
	<i>Parinari curatellifolia</i>	36	9.42
DBH < 20 cm	<i>Erythrophleum africanum</i>	16	3.30
	<i>Brachystegia glaucescens</i>	8	1.93
	<i>Erythrophleum africanum</i>	4	3.25
	<i>Diplorhynchus condylocarpon</i>	11	2.83

Sampling point 34:

Coordinates: S 6°75658 / E 31°70879
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 12-14m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4136 / 4137 / 4138 / 4139
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	25	3.44
	<i>Albizia antunesiana</i>	31	2.50
	<i>Julbernardia globiflora</i>	39	35.10
	<i>Phyllocosmus leimareanus</i>	24	5.50
DBH < 20 cm	<i>Hexalobus monopetalus</i>	7	3.84
	<i>Combretum molle</i>	8	4.10
	<i>Diplorhynchus condylocarpon</i>	8	8.60
	<i>Bobgunnia madagascariensis</i>	7	2.45

Sampling point 35:

Coordinates: S 6°75501 / E 31°71039
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 14 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4141 / 4142 / 4143 / 4144
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	48	2.10
	<i>Julbernardia globiflora</i>	48	1.90
	<i>Julbernardia globiflora</i>	44	13
	<i>Brachystegia spiciformis</i>	24	2.15
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	12	4.95
	<i>Hexalobus monopetalus</i>	5	2.90
	<i>Lannea schimperi</i>	14	13.50
	<i>Diplorhynchus condylocarpon</i>	6	9.00

Sampling point 36:

Coordinates: S 6°75334 / E 31°71138
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 11 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4147 / 4148 / 4149 / 4150
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	32	5.50
	<i>Julbernardia globiflora</i>	36	5.25
	<i>Phyllocosmus leimareanus</i>	25	11.04
	<i>Julbernardia globiflora</i>	40	10.80
DBH < 20 cm	<i>Brachystegia glaucescens</i>	15	8.00
	<i>Pseudolachnostylis maprouneifolia</i>	12	4.95
	<i>Pterocarpus angolensis</i>	5	14.27
	<i>Albizia antunesiana</i>	4	8.73

Sampling point 37:

Coordinates: S 6°75182 / E 31°71277
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 14 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4151 / 4152 / 4153 / 4154
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	32	1.10
	<i>Julbernardia globiflora</i>	36	3.13
	<i>Julbernardia globiflora</i>	37	1.00
	<i>Pseudolachnostylis maprouneifolia</i>	21	19.50
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	10	11.90
	<i>Maranthes floribunda</i>	16	8.20
	<i>Pterocarpus angolensis</i>	19	8.82
	<i>Monanthonotaxis discolor</i>	4	6.20

Sampling point 38:

Coordinates: S 6°75022 / E 31°71382
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 8 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4156 / 4157 / 4158 / 4159
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	40	9.45
	<i>Brachystegia glaucescens</i>	25	6.00
	<i>Anisophyllea pomifera</i>	26	5.82
	<i>Albizia antunesiana</i>	40	10.77
DBH < 20 cm	<i>Phyllocosmus leimareanus</i>	11	5.37
	<i>Phyllocosmus leimareanus</i>	4	1.22
	<i>Brachystegia glaucescens</i>	11	3.35
	<i>Phyllocosmus leimareanus</i>	13	5.70

Sampling point 39:

Coordinates: S 6°74841 / E 31°71442
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 10 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4160 / 4161 / 4162 / 4163
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Monotes africanus</i>	36	22.85
	<i>Vitex doniana</i>	27	16.75
	<i>Brachystegia spiciformis</i>	37	13.20
	<i>Lannea schimperi</i>	28	13.15
DBH < 20 cm	<i>Brachystegia spiciformis</i>	15	4.20
	<i>Erythrophleum africanum</i>	4	4.72
	<i>Erythrophleum africanum</i>	4	2.74
	<i>Diplorhynchus condylocarpon</i>	7	1.55

Sampling point 40:

Coordinates: S 6°74684 / E 31°71562
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 8-10 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4164 / 4165 / 4166 / 4167
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	35	23.94
	<i>Erythrophleum africanum</i>	23	17.60
	<i>Julbernardia globiflora</i>	40	12.85
	<i>Brachystegia manga</i>	22	6.25
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	7	4.62
	<i>Strychnos innocua</i>	10	4.30
	<i>Monotes africanus</i>	14	9.00
	<i>Strychnos innocua</i>	6	1.35

Sampling point 41:

Coordinates: S 6°74531 / E 31°71693
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 12 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4168 / 4169 / 4170 / 4171
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	30	8.10
	<i>Monotes africanus</i>	38	13.40
	<i>Erythrophleum africanum</i>	35	9.40
	<i>Parinari curatellifolia</i>	53	29.15
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	12	2.43
	<i>Monotes africanus</i>	8	1.16
	<i>Brachystegia glaucescens</i>	4	4.89
	<i>Uapaca nitida</i>	6	2.93

Sampling point 42:

Coordinates: S 6°74379 / E 31°71832
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 12 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4172 / 4173 / 4174 / 4175
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus angolensis</i>	23	9.86
	<i>Maranthes floribunda</i>	45	17.10
	<i>Parinari curatellifolia</i>	27	6.10
	<i>Julbernardia globiflora</i>	44	6.65
DBH < 20 cm	<i>Julbernardia globiflora</i>	4	2.10
	<i>Maytenus senegalensis</i>	4	1.45
	<i>Brachystegia glaucescens</i>	4	2.80
	<i>Julbernardia globiflora</i>	4	3.40

Sampling point 43:

Coordinates: S 6°74219 / E 31°71948

Slope: not recorded, slope exposure: not recorded

Dominant tree height: 12-14 m

Basal area (Bitterlich, k=1): not recorded

Photos: ???

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	39	7.20
	<i>Parinari curatellifolia</i>	25	7.02
	<i>Parinari curatellifolia</i>	23	7.50
	<i>Julbernardia globiflora</i>	51	6.10
DBH < 20 cm	<i>Monanthes discolor</i>	9	3.06
	<i>Ochna inermis</i>	5	3.23
	<i>Diplorhynchus condylocarpon</i>	12	4.65
	<i>Hexalobus monopetalus</i>	6	3.90

Sampling point 44:

Coordinates: S 6°74048 / 31°72050

Slope: not recorded, slope exposure: not recorded

Dominant tree height: 10-12 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4210 / 4211 / 4212 / 4213

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Anisophyllea pomifera</i>	28	15.16
	<i>Julbernardia globiflora</i>	47	4.72
	<i>Julbernardia globiflora</i>	31	10.93
	<i>Parinari curatellifolia</i>	28	10.80
DBH < 20 cm	<i>Brachystegia spiciformis</i>	18	2.64
	<i>Diplorhynchus condylocarpon</i>	6	2.45
	<i>Hexalobus monopetalus</i>	5	8.90
	<i>Cassipourea mollis</i>	6	6.20

Sampling point 45:

Coordinates: S 6°73917 / E 31°72186

Slope: not recorded, slope exposure: not recorded

Dominant tree height: 12-13 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4214 / 4215 / 4216 / 4217

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Lannea schimperi</i>	35	10.35
	<i>Brachystegia spiciformis</i>	102	12.50
	<i>Brachystegia spiciformis</i>	86	17.60
	<i>Lannea schimperi</i>	35	17.70
DBH < 20 cm	<i>Hexalobus monopetalus</i>	4	3.53
	<i>Hexalobus monopetalus</i>	7	6.30
	<i>Pseudolachnostylis maprouneifolia</i>	3	2.34
	<i>Brachystegia glaucescens</i>	11	4.55

Sampling point 46:

Coordinates: S 6°73760 / E 31°72293
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 12-14 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4218 / 4219 / 4220 / 4221
 Disturbances/notes: 20 step (1) tree cut for honey

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	34	4
	<i>Brachystegia spiciformis</i>	45	8.50
	<i>Julbernardia globiflora</i>	33	14.30
	<i>Anisophyllea pomifera</i>	29	6.56
DBH < 20 cm	<i>Rhus longipes</i>	6	4.32
	<i>Pseudolachnostylis maprouneifolia</i>	15	13.65
	<i>Phyllocosmus leimareanus</i>	19	4.40
	<i>Diplorhynchus condylocarpon</i>	8	1.80

Sampling point 47:

Coordinates: S 6°73570 / E 31°72468
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 14-16 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4222 / 4223/ 4224 / 4225
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	29	8.81
	<i>Brachystegia spiciformis</i>	84	9.35
	<i>Julbernardia globiflora</i>	37	9.00
	<i>Pterocarpus angolensis</i>	44	24.80
DBH < 20 cm	<i>Albizia antunesiana</i>	9	6.25
	<i>Memecylon flavovirens</i>	4	9.90
	<i>Anisophyllea pomifera</i>	19	11.25
	<i>Olax obtusifolia</i>	4	5.15

Sampling point 48:

Coordinates: S 6°73429 / 31°72614
 Slope: not recorded, slope exposure: not recorded
 Dominant tree height: 16-18 m
 Basal area (Bitterlich, k=1): not recorded
 Photos: 4226 / 4227 / 4228/ 4229
 Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Maranthes floribunda</i>	32	13.40
	<i>Julbernardia globiflora</i>	34	13.20
	<i>Julbernardia globiflora</i>	45	15
	<i>Olax obtusifolia</i>	36	5.37
DBH < 20 cm	<i>Schrebera trichoclada</i>	4	10.17
	<i>Pseudolachnostylis maprouneifolia</i>	8	10.90
	<i>Pterocarpus angolensis</i>	6	7.85
	<i>Erythrophleum africanum</i>	18	10.85

Sampling point 49:

Coordinates: S 6°73270 / 31°72739

Slope: not recorded, slope exposure: not recorded

Dominant tree height: 10-12 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4231 / 4232 / 4233 / 4234

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	47	15.30
	<i>Brachystegia spiciformis</i>	41	9.05
	<i>Julbernardia globiflora</i>	35	15
	<i>Pterocarpus angolensis</i>	24	16.20
DBH < 20 cm	<i>Albizia antunesiana</i>	6	6.45
	<i>Lannea schimperi</i>	19	9.30
	<i>Combretum collinum</i>	14	4.75
	<i>Albizia antunesiana</i>	6	5.50

Sampling point 50:

Coordinates: S 6°73103 / E 31°72838

Slope: not recorded, slope exposure: not recorded

Dominant tree height: 14 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4235 / 4236 / 4237 / 4238

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Anisophyllea pomifera</i>	29	7.06
	<i>Phyllocosmus leimareanus</i>	27	20.25
	<i>Erythrophleum africanum</i>	29	7.50
	<i>Julbernardia globiflora</i>	39	6.35
DBH < 20 cm	<i>Erythrophleum africanum</i>	4	1.50
	<i>Pseudolachnostylis maprouneifolia</i>	11	6.90
	<i>Pterocarpus angolensis</i>	13	11.76
	<i>Brachystegia manga</i>	7	5.40

Transect 2: Lower land near German road (below escarpment)

Starting point main road: S 6°55010 / E 31°83249; azimuth: 227°

Sampling point 1:

Coordinates: S 6°55138 / E 31°83089

Slope: 1-2%, slope exposure: 105°

Dominant tree height: 12 m

Basal area (Bitterlich, k=1): 12 m²

Photos: 6110, 6111, 6112, 6113

Disturbances/notes: -

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Erythrophleum africanum</i>	20	9.18
	<i>Pterocarpus angolensis</i>	25	9.51
	<i>Pterocarpus angolensis</i>	21	0.88
	<i>Strychnos innocua</i>	21	13.47
DBH < 20 cm	<i>Combretum molle</i>	12	2.06
	<i>Bobgunnia madagascariensis</i>	10	8.00
	<i>Brachystegia utilis</i>	18	2.19
	<i>Terminalia kaiseriana</i>	4	1.24

Sampling point 2:

Coordinates: S 6°55242 / E 31°82926

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 13 m²

Photos: 6114, 6115, 6116, 6117

Disturbances/notes: -

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum fragrans</i>	25	2.69
	<i>Combretum fragrans</i>	29	6.36
	<i>Pseudolachnostylis maprouneifolia</i>	20	4.56
	<i>Julbernardia globiflora</i>	35	9.99
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	10	6.62
	<i>Lonchocarpus capassa</i>	5	12.36
	<i>Diplorhynchus condylocarpon</i>	5	9.21
	<i>Hymenocardia acida</i>	4	5.95

Sampling point 3:

Coordinates: S 6°55346 / E 31°82764

Slope: - 1%; slope exposure: 90°

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 7 m²

Photos: 6118, 6119, 6120, 6121

Disturbances/notes: -

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Isoberlinia angolensis</i>	20	3.63
	<i>Julbernardia globiflora</i>	27	7.92
	<i>Julbernardia globiflora</i>	34	19.25
	<i>Isoberlinia angolensis</i>	22	8.70
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	14	6.00
	<i>Brachystegia utilis</i>	13	6.87
	<i>Hymenocardia acida</i>	4	4.90
	<i>Diplorhynchus condylocarpon</i>	7	4.99

Sampling point 4:

Coordinates: S 6°55468 / E 31°82611

Slope: - 1%; slope exposure: 105°

Dominant tree height: 15 m

Basal area (Bitterlich, k=1): 11.5 m²

Photos: 6122, 6123, 6124, 6125

Disturbances/notes: -

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Isoberlinia angolensis</i>	31	15.45
	<i>Erythrophleum africanum</i>	20	8.11
	<i>Julbernardia globiflora</i>	32	3.23
	<i>Brachystegia spiciformis</i>	25	17.57
DBH < 20 cm	<i>Memecylon flavovirens</i>	5	2.06
	<i>Rothmannia engleriana</i>	3	3.64
	<i>Bobgunnia madagascariensis</i>	7	2.93
	<i>Bobgunnia madagascariensis</i>	4	1.30

Sampling point 5:

Coordinates: S 6°55580 / E 31°82459

Slope: +/- flat

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 11 m²

Photos: 6126, 6127, 6128, 6129

Disturbances/notes: -

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia utilis</i>	35	12.89
	<i>Julbernardia globiflora</i>	31	6.88
	<i>Brachystegia utilis</i>	36	6.35
	<i>Brachystegia utilis</i>	25	13.60
DBH < 20 cm	<i>Burkea africana</i>	16	1.02
	<i>Burkea africana</i>	15	3.21
	<i>Pseudolachnostylis maprouneifolia</i>	11	5.96
	<i>Erythrophleum africanum</i>	7	5.06

Sampling point 6:

Coordinates: S 6°55694 / E 31°82294

Slope: - 1%; slope exposure: 90°

Dominant tree height: 16 m

Basal area (Bitterlich, k=1): 6 m²

Photos: 6130, 6131, 6132, 6133

Disturbances/notes (6 – 7):

3 *Pseudolachnostylis m.* cut for poles (Ø 12-15 cm; >5 yrs) (30 – 50 steps)1 *Julbernardia globiflora* tree barking for bee hives (Ø 22 cm; >5 yrs) (70 steps)5 *Pterocarpus angolensis* cut for timber (>5 yrs) (90 steps)1 *Julbernardia globiflora* tree barking for bee hives (Ø 30 cm; >5 yrs) (145 steps)

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	37	8.40
	<i>Pericopsis angolensis</i>	41	19.88
	<i>Pterocarpus angolensis</i>	35	13.50
	<i>Isoberlinia angolensis</i>	35	14.95
DBH < 20 cm	<i>Crossopteryx febrifuga</i>	3	5.26
	<i>Brachystegia utilis</i>	3	10.93
	<i>Bobgunnia madagascariensis</i>	5	6.95
	<i>Pseudolachnostylis maprouneifolia</i>	13	12.70

Sampling point 7:

Coordinates: S 6°55796 / E 31°82143

Slope: +/- flat

Dominant tree height: 18 m

Basal area (Bitterlich, k=1): 8.5 m²

Photos: 6134, 6135, 6136, 6137

Disturbances/notes (7 – 8):

1 *Brachystegia utilis* cut wild honey harvesting (50 steps)

1 *Pterocarpus angolensis* cut for timber (Ø 35 cm; >5 yrs) (190 steps)

1 *Julbernardia globiflora* cut for timber? (Ø 25 cm; >5 yrs) (190 steps)

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pericopsis angolensis</i>	21	9.28
	<i>Brachystegia utilis</i>	30	4.04
	<i>Brachystegia utilis</i>	24	12.63
	<i>Brachystegia utilis</i>	31	6.11
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	19	6.40
	<i>Pseudolachnostylis maprouneifolia</i>	9	7.30
	<i>Julbernardia globiflora</i>	3	8.53
	<i>Pseudolachnostylis maprouneifolia</i>	13	7.30

Sampling point 8:

Coordinates: S 6°55909 / E 31°81994

Slope: +/- flat

Dominant tree height: 17 m

Basal area (Bitterlich, k=1): 16 m²

Photos: 6138, 6139, 6140, 6141

Disturbances/notes: -

Diameter class	Nearest species in the each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	25	3.20
	<i>Diplorhynchus condylocarpon</i>	24	7.47
	<i>Brachystegia utilis</i>	25	8.06
	<i>Borassus aethiopum</i>	47	9.85
DBH < 20 cm	<i>Uapaca nitida</i>	8	6.05
	<i>Brachystegia utilis</i>	6	3.60
	<i>Bobgunnia madagascariensis</i>	11	2.93
	<i>Uapaca nitida</i>	8	3.80

Sampling point 9 (9 – 50 Lucile)

Coordinates: S 6°56054 / E 31°81868

Slope: +/- flat

Dominant tree height: 9 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3844 / 3845 / 3846 / 3847

Disturbances/notes: + 280 steps: (1) tree cut for timber (>10 years)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	23	13.50
	<i>Brachystegia manga</i>	35	11
	<i>Brachystegia manga</i>	36	10.70
	<i>Julbernardia globiflora</i>	35	19.50
DBH < 20 cm	<i>Bobgunnia madagascariensis</i>	10	4.20
	<i>Julbernardia globiflora</i>	12	2.35
	<i>Brachystegia spiciformis</i>	9	3
	<i>Maprounea africana</i>	9	3

Sampling point 10

Coordinates: S 6°56202 / E 31°81752

Slope: +/- flat

Dominant tree height: 6-7 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3848 / 3849 / 3850 / 3851

Disturbances/notes: + 20 steps (1) tree cut for timber (>10 years)
+ 80 steps (1) cutting down tree for honey (> 5 years)
+290 steps (1) cutting down tree for honey (> 5 years)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia spiciformis</i>	28	8.30
	<i>Pterocarpus angolensis</i>	25	7.00
	<i>Brachystegia spiciformis</i>	29	9.30
	<i>Azelia quanzensis</i>	27	4.70
DBH < 20 cm	<i>Strychnos pungens</i>	14	7.70
	<i>Bobgunnia madagascariensis</i>	11	8.40
	<i>Pseudolachnostylis maprouneifolia</i>	14	6.55
	<i>Hymenocardia acida</i>	5	4.50

Sampling point 11

Coordinates: S 6°56198 / E 31°81753

Slope: +/- flat

Dominant tree height: 8 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3855 / 3856 / 3857 / 3858

Disturbances/notes: + 280 steps (1) debarking tree for beehives (>3 years) / +10 steps (1) timbering (>10 years) / +64 steps (1) timbering (>10 years) / +130 steps (1) timbering (>10 years) / +175 steps (1) timbering (>10 years) / +240 steps (1) timbering (>10 years)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	28	7
	<i>Strychnos pungens</i>	22	3.90
	<i>Brachystegia manga</i>	24	3.50
	<i>Julbernardia globiflora</i>	27	8.30
DBH < 20 cm	<i>Ziziphus sp.</i>	9	15.70
	<i>Erythrophleum africanum</i>	6	4
	<i>Diplorhynchus condylocarpon</i>	12	7.60
	<i>Brachystegia manga</i>	18	4.70

Sampling point 12

Coordinates: S 6°56526 / E 31°81499

Slope: +/- flat

Dominant tree height: 10 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3859 / 3860 / 3861 / 3862

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	21	11.50
	<i>Julbernardia globiflora</i>	26	8.10
	<i>Julbernardia globiflora</i>	32	8.80
	<i>Brachystegia spiciformis</i>	34	10
DBH < 20 cm	<i>Pterocarpus angolensis</i>	17	8.20
	<i>Erythrophleum africanum</i>	14	5.50
	<i>Erythrophleum africanum</i>	12	5.80
	<i>Diplorhynchus condylocarpon</i>	11	1.40

Sampling point 13

Coordinates: S 6°56687 / E 31°81383

Slope: +/- flat

Dominant tree height: 6-8 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3868 / 3869 / 3870 / 3871

Disturbances/notes: -

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	38	9.60
	<i>Lannea schimperi</i>	29	17.60
	<i>Julbernardia globiflora</i>	35	16.10
	<i>Julbernardia globiflora</i>	38	10.90
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	7	3.80
	<i>Euphorbia matabelensis</i>	12	0.70
	<i>Flacourtia indica</i>	5	2.90
	<i>Pterocarpus angolensis</i>	7	3.20

Sampling point 14

Coordinates: S 6°56875 / E 31°81290

Slope: +/- flat

Dominant tree height: 8-10m

Basal area (Bitterlich, k=1): not recorded

Photos: 3891 / 3892 / 3893 / 3894

Disturbances/notes: +28 steps (1) timbering (> 5 years)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	27	6.80
	<i>Brachystegia manga</i>	36	9.30
	<i>Brachystegia manga</i>	51	6.45
	<i>Pseudolachnostylis maprouneifolia</i>	23	4.50
DBH < 20 cm	<i>Brachystegia glaucescens</i>	12	2.90
	<i>Diplorhynchus condylocarpon</i>	16	3.45
	<i>Monanthes discolor</i>	9	10.95
	<i>Hymenocardia acida</i>	6	15.10

Sampling point 15

Coordinates: S 6°57085 / E 31°81202

Slope: +/- flat

Dominant tree height: 10-12m

Basal area (Bitterlich, k=1): not recorded

Photos: 3895 / 3896 / 3897 / 3898

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Lannea schimperi</i>	25	7.80
	<i>Brachystegia manga</i>	20	10.60
	<i>Brachystegia manga</i>	27	9.60
	<i>Isobertia angolensis</i>	32	13.53
DBH < 20 cm	<i>Isobertia angolensis</i>	6	2.65
	<i>Hymenocardia acida</i>	5	3.07
	<i>Brachystegia spiciformis</i>	14	8.65
	<i>Oldfieldia dactylophylla</i>	3	5.15

Sampling point 16

Coordinates: S 6°57246 / E 31°81025

Slope: +/- flat

Dominant tree height: 6-8m

Basal area (Bitterlich, k=1): not recorded

Photos: 3903 / 3904 / 3905 / 3906

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pericopsis angolensis</i>	37	7.35
	<i>Pterocarpus angolensis</i>	26	2.35
	<i>Combretum molle</i>	26	15.37
	<i>Brachystegia glaucescens</i>	25	8.45
DBH < 20 cm	<i>Oldfieldia dactylophylla</i>	7	3.45
	<i>Oldfieldia dactylophylla</i>	17	7.12
	<i>Pterocarpus angolensis</i>	15	2.65
	<i>Pterocarpus angolensis</i>	8	8.80

Sampling point 17

Coordinates: S 6°57419/ E 31°80906

Slope: +/- flat

Dominant tree height: 6-7 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3907 / 3908 / 3909 / 3910

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	22	10.50
	<i>Combretum fragrans</i>	26	11.40
	<i>Pterocarpus tinctorius</i>	25	14.40
	<i>Dalbergia nitidula</i>	37	3.90
DBH < 20 cm	<i>Brachystegia glaucescens</i>	10	8.55
	<i>Bauhinia thonningii</i>	7	7.30
	<i>Annona senegalensis</i>	6	12.60
	<i>Bauhinia thonningii</i>	7	5.30

Sampling point 18

Coordinates: S 6°57592 / E 31°80795

Slope: +/- flat

Dominant tree height: 8 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3911 / 3912 / 3913 / 3914

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum fragrans</i>	25	10.40
	<i>Diplorhynchus condylocarpon</i>	23	8.15
	<i>Brachystegia glaucescens</i>	56	17.40
	<i>Dalbergia nitidula</i>	32	8.05
DBH < 20 cm	<i>Combretum fragrans</i>	9	6.60
	<i>Diplorhynchus condylocarpon</i>	9	7.95
	<i>Lannea schimperi</i>	8	5.90
	<i>Combretum molle</i>	7	6.25

Sampling point 19

Coordinates: S 6°57777 / E 31°80689

Slope: +/- flat

Dominant tree height: 6-8 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3915 / 3916 / 3917 / 3918

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Dalbergia nitidula</i>	36	25.56
	<i>Combretum molle</i>	26	8.35
	<i>Brachystegia glaucescens</i>	42	14.15
	<i>Brachystegia glaucescens</i>	35	25.40
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	10	5
	<i>Combretum molle</i>	13	8.07
	<i>Terminalia kaiseriana</i>	11	3.20
	<i>Pterocarpus tinctorius</i>	13	3.30

Sampling point 20

Coordinates: S 6°57956 / E 31°80575

Slope: +/- flat

Dominant tree height: 6-8m

Basal area (Bitterlich, k=1): not recorded

Photos: ??? / 3920 / 3921 / 3922

Disturbances/notes: +280 steps (2) tree cut for honey

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus tinctorius</i>	24	4.40
	<i>Brachystegia glaucescens</i>	43	9.20
	<i>Brachystegia glaucescens</i>	25	27.50
	<i>Brachystegia glaucescens</i>	51	25.20
DBH < 20 cm	<i>Pterocarpus tinctorius</i>	11	6.50
	<i>Acacia gerrardii</i>	5	8.23
	<i>Brachystegia glaucescens</i>	10	18.70
	<i>Combretum fragrans</i>	6	14.10

Sampling point 21

Coordinates: S 6°58118 / E 31°80454

Slope: +/- flat

Dominant tree height: 6-7m

Basal area (Bitterlich, k=1): not recorded

Photos: 3924 / 3925 / 3926 / 3927

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia glaucescens</i>	43	10.40
	<i>Sterculia quinqueloba</i>	24	16.10
	<i>Combretum fragrans</i>	32	31.00
	<i>Combretum molle</i>	25	6.10
DBH < 20 cm	<i>Combretum fragrans</i>	8	1.40
	<i>Sterculia quinqueloba</i>	4	5.12
	<i>Combretum fragrans</i>	12	7.30
	<i>Diplorhynchus condylocarpon</i>	13	6.00

Sampling point 22

Coordinates: S 6°58294 / E 31°80357
Slope: +/- flat
Dominant tree height: 10-12 m
Basal area (Bitterlich, k=1): not recorded
Photos: 3928 / 3929 / 3930 / 3931
Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia glaucescens</i>	35	12.45
	<i>Brachystegia glaucescens</i>	31	10.75
	<i>Brachystegia glaucescens</i>	56	30.80
	<i>Brachystegia glaucescens</i>	37	9.10
DBH < 20 cm	<i>Acacia gerrardii</i>	6	3.74
	<i>Combretum fragrans</i>	8	12.15
	<i>Lannea schimperi</i>	6	16
	<i>Diplorhynchus condylocarpon</i>	6	12.08

Sampling point 23

Coordinates: S 6°58455 / E 31°80247
Slope: +/- flat
Dominant tree height: 6-8m
Basal area (Bitterlich, k=1): not recorded
Photos: 3932 / 3933 / 3934 / 3935
Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia glaucescens</i>	31	9.70
	<i>Brachystegia glaucescens</i>	77	48.65
	<i>Brachystegia glaucescens</i>	62	16.70
	<i>Pterocarpus tinctorius</i>	43	6.80
DBH < 20 cm	<i>Brachystegia glaucescens</i>	13	9.50
	<i>Annona senegalensis</i>	7	5.32
	<i>Pterocarpus angolensis</i>	17	11.40
	<i>Dichrostachys cinerea</i>	4	11.95

Sampling point 24

Coordinates: S 6°58594 / E 31°80065
Slope: +/- flat
Dominant tree height: 5-6 m
Basal area (Bitterlich, k=1): not recorded
Photos: 3938 / 3939 / 3940 / 3941
Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Dalbergia nitidula</i>	42	20
	<i>Euphorbia matabelensis</i>	27	17
	<i>Terminalia mollis</i>	26	46.45
	<i>Ozoroa insignis subsp. reticulata</i>	53	50.40
DBH < 20 cm	<i>Bauhinia thonningii</i>	4	2.88
	<i>Acacia gerrardii</i>	5	1.15
	<i>Acacia gerrardii</i>	5	6.15
	<i>Combretum fragrans</i>	8	3.60

Sampling point 25

Coordinates: S 6°58765 / E 31°79945

Slope: +/- flat

Dominant tree height: 4-6m

Basal area (Bitterlich, k=1): not recorded

Photos: 3946 / 3947 / 3948 / 3949

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pericopsis angolensis</i>	26	48.6
	<i>Combretum molle</i>	33	42.10
	<i>Combretum fragrans</i>	23	25.10
	<i>Combretum fragrans</i>	22	57
DBH < 20 cm	<i>Combretum fragrans</i>	4	7.26
	<i>Combretum fragrans</i>	4	13.35
	<i>Bauhinia thonningii</i>	11	4.35
	<i>Acacia gerrardii</i>	8	6.00

Sampling point 26

Coordinates: S 6°58816 / E 31°79709

Slope: +/- flat

Dominant tree height: 4-6 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3950 / 3951 / 3952 / 3953

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia glaucescens</i>	23	14.80
	<i>Combretum collinum</i>	33	7.60
	<i>Oldfieldia dactylophylla</i>	32	17.70
	<i>Erythrophleum africanum</i>	36	7.55
DBH < 20 cm	<i>Acacia gerrardii</i>	4	9.90
	<i>Combretum collinum</i>	5	7.72
	<i>Brachystegia glaucescens</i>	18	1.15
	<i>Diplorhynchus condylocarpon</i>	16	3.55

Sampling point 27

Coordinates: S 6°58901 / E 31°79709

Slope: +/- flat

Dominant tree height: 4-6 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3954 / 3955 / 3956 / 3957

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum molle</i>	27	6.70
	<i>Brachystegia glaucescens</i>	66	35.90
	<i>Pericopsis angolensis</i>	30	14.60
	<i>Combretum molle</i>	25	26.86
DBH < 20 cm	<i>Combretum fragrans</i>	11	2.90
	<i>Terminalia kaiseriana</i>	9	5.40
	<i>Pterocarpus tinctorius</i>	18	6.35
	<i>Combretum fragrans</i>	8	1.64

Sampling point 28

Coordinates: S 6°59042 / E 31°79450

Slope: +/- flat

Dominant tree height: 8-10 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3963 / 3964 / 3965 / 3966

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia glaucescens</i>	44	3.50
	<i>Brachystegia glaucescens</i>	46	4.07
	<i>Xeroderris stuhlmannii</i>	34	44.66
	<i>Pericopsis angolensis</i>	39	21.60
DBH < 20 cm	<i>Combretum molle</i>	6	1.53
	<i>Pterocarpus tinctorius</i>	8	2.67
	<i>Diplorhynchus condylocarpon</i>	7	1.90
	<i>Combretum molle</i>	7	1.75

Sampling point 29

Coordinates: S 6°56054 / E 31°81868

Slope: +/- flat

Dominant tree height: 9 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3967 / 3968 / 3969 / 3970

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Diospyros cornii</i>	31	39.36
	<i>Diospyros cornii</i>	22	17.05
	<i>Diospyros cornii</i>	31	12.13
	<i>Diospyros cornii</i>	31	25.05
DBH < 20 cm	<i>Combretum fragrans</i>	5	12.95
	<i>Acacia gerrardii</i>	5	7.55
	<i>Acacia gerrardii</i>	6	6.44
	<i>Acacia gerrardii</i>	4	10.10

Sampling point 30

Coordinates: S 6°59351 / E 31°79137

Slope: +/- flat

Dominant tree height: 9 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3971 / 3972 / 3973 / 3974

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia glaucescens</i>	31	27.90
	<i>Brachystegia glaucescens</i>	50	28.10
	<i>Combretum molle</i>	24	7.84
	<i>Brachystegia glaucescens</i>	30	10.15
DBH < 20 cm	<i>Pterocarpus angolensis</i>	7	7.88
	<i>Combretum molle</i>	18	3.35
	<i>Acacia polyacantha</i>	6	5.55
	<i>Pterocarpus tinctorius</i>	5	11.10

Sampling point 31

Coordinates: S 6°59473 / E 31°78987

Slope: +/- flat

Dominant tree height: 10-12 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3975 / 3976 / 3977 / 3978

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia glaucescens</i>	45	12.82
	<i>Acacia stuhlmannii</i>	24	1190
	<i>Pterocarpus angolensis</i>	43	3.34
	<i>Lannea schimperi</i>	28	19.80
DBH < 20 cm	<i>Eriosema</i>	7	10.90
	<i>Sterculia africana</i>	6	8.45
	<i>Diplorhynchus condylocarpon</i>	10	1.42
	<i>Diplorhynchus condylocarpon</i>	17	5.55

Sampling point 32

Coordinates: S 6°59624 / E 31°78880

Slope: +/- flat

Dominant tree height: 9 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3979 / 3980 / 3981 / 3982

Disturbances/notes: + 10 steps (1) tree cut for honey

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia glaucescens</i>	44	6.85
	<i>Pterocarpus angolensis</i>	37	12.00
	<i>Brachystegia glaucescens</i>	39	4.82
	<i>Erythrophleum africanum</i>	24	15.15
DBH < 20 cm	<i>Pterocarpus angolensis</i>	4	1.60
	<i>Oldfieldia dactylophylla</i>	7	5
	<i>Terminalia kaiseriana</i>	10	2.45
	<i>Combretum collinum</i>	6	7.55

Sampling point 33

Coordinates: S 6°59788 / E 31°78773

Slope: +/- flat

Dominant tree height: 9 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3983 / 3984 / 3985 / 3986

Disturbances/notes: +170 steps (1) tree cut for honey

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus angolensis</i>	32	6.15
	<i>Brachystegia glaucescens</i>	42	14.80
	<i>Pterocarpus angolensis</i>	26	18.20
	<i>Brachystegia glaucescens</i>	40	9.70
DBH < 20 cm	<i>Pseudolachnostylis maprouneifolia</i>	8	11.60
	<i>Combretum collinum</i>	17	3.90
	<i>Pterocarpus angolensis</i>	5	16.08
	<i>Combretum collinum</i>	8	4.00

Sampling point 34

Coordinates: S 6°59917 / E 31°78625

Slope: +/- flat

Dominant tree height: m

Basal area (Bitterlich, k=1): not recorded

Photos: 3988 / 3989 / 3990 / 3991

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Strychnos potatorum</i>	25	6.70
	<i>Combretum fragrans</i>	22	7.85
	<i>Lannea schimperi</i>	32	18.70
	<i>Monotes africanus</i>	35	8.15
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	7	2.95
	<i>Brachystegia glaucescens</i>	6	3.12
	<i>Brachystegia glaucescens</i>	5	3.04
	<i>Julbernardia globiflora</i>	7	1.75

Sampling point 35

Coordinates: S 6°60099 / E 31°78449

Slope: +/- flat

Dominant tree height: 10-12 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3992 / 3993 / 3994 / 3995

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Terminalia kaiseriana</i>	23	19.15
	<i>Lannea schimperi</i>	27	4.75
	<i>Brachystegia manga</i>	46	6.00
	<i>Pterocarpus angolensis</i>	35	18.35
DBH < 20 cm	<i>Pterocarpus angolensis</i>	4	4.50
	<i>Pseudolachnostylis maprouneifolia</i>	4	4.10
	<i>Flacourtia indica</i>	6	5.70
	<i>Oldfieldia dactylophylla</i>	4	3.50

Sampling point 36

Coordinates: S 6°60270 / E 31°78331

Slope: +/- flat

Dominant tree height: 6 m

Basal area (Bitterlich, k=1): not recorded

Photos: 3996 / 3997 / 3998 / 3999

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Burkea africana</i>	28	23.80
	<i>Cassia singueana</i>	27	14.90
	<i>Pseudolachnostylis maprouneifolia</i>	27	11.00
	<i>Lannea schimperi</i>	26	14.95
DBH < 20 cm	<i>Brachystegia manga</i>	7	3.30
	<i>Pterocarpus angolensis</i>	4	7.75
	<i>Combretum fragrans</i>	4	5.68
	<i>Erythrophleum africanum</i>	4	8.00

Sampling point 37

Coordinates: S 6°60428 / E 31°78217

Slope: +/- flat

Dominant tree height: 6-8m

Basal area (Bitterlich, k=1): not recorded

Photos: 4000 / 4001 / 4002 / 4003

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	35	5.65
	<i>Brachystegia manga</i>	24	4.05
	<i>Brachystegia manga</i>	29	37.50
	<i>Brachystegia manga</i>	29	20.10
DBH < 20 cm	<i>Oldfieldia dactylophylla</i>	6	8.20
	<i>Dalbergia nitidula</i>	5	6.20
	<i>Oldfieldia dactylophylla</i>	4	4.15
	<i>Pseudolachnostylis maprouneifolia</i>	5	4.40

Sampling point 38

Coordinates: S 6°60569 / E 31°78066

Slope: +/- flat

Dominant tree height: 8-10 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4004 / 4005 / 4006 / 4007

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	31	3.72
	<i>Terminalia kaiseriana</i>	27	13.30
	<i>Pterocarpus angolensis</i>	39	11.33
	<i>Brachystegia glaucescens</i>	57	20.62
DBH < 20 cm	<i>Phyllocosmus leimareanus</i>	9	4.00
	<i>Pseudolachnostylis maprouneifolia</i>	5	1.65
	<i>Oldfieldia dactylophylla</i>	17	7.00
	<i>Terminalia kaiseriana</i>	6	1.45

Sampling point 39

Coordinates: S 6°60706 / E 31°77926

Slope: +/- flat

Dominant tree height: 8 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4009 / 4010 / 4011 / 4012

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	25	8.06
	<i>Brachystegia manga</i>	24	10.01
	<i>Brachystegia manga</i>	23	6.05
	<i>Pterocarpus angolensis</i>	30	9.10
DBH < 20 cm	<i>Hymenocardia acida</i>	6	13.35
	<i>Oldfieldia dactylophylla</i>	10	2.08
	<i>Brachystegia manga</i>	19	3.05
	<i>Monotes africanus</i>	17	7.55

Sampling point 40

Coordinates: S 6°60842 / E 31°77768

Slope: +/- flat

Dominant tree height: 8-10 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4013 / 4014 / 4015 / 4016

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pericopsis angolensis</i>	28	15.83
	<i>Pseudolachnostylis maprouneifolia</i>	58	16.75
	<i>Burkea africana</i>	37	5.02
	<i>Julbernardia globiflora</i>	36	10.72
DBH < 20 cm	<i>Hymenocardia acida</i>	11	4.55
	<i>Pterocarpus angolensis</i>	13	1.45
	<i>Bobgunnia madagascariensis</i>	13	10.70
	<i>Oldfieldia dactylophylla</i>	11	1.28

Sampling point 41

Coordinates: S 6°60977/ E 31°77606

Slope: +/- flat

Dominant tree height: 6-8 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4018 / 4019 / 4020 / 4021

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	28	12.78
	<i>Brachystegia manga</i>	50	22.65
	<i>Brachystegia manga</i>	27	19.15
	<i>Terminalia kaiseriana</i>	29	5.86
DBH < 20 cm	<i>Phyllocosmus leimareanus</i>	19	0.86
	<i>Brachystegia manga</i>	3	0.90
	<i>Hymenocardia acida</i>	4	5.36
	<i>Brachystegia manga</i>	9	2.87

Sampling point 42

Coordinates: S 6°60888 / E 31°77792

Slope: +/- flat

Dominant tree height: 6-8 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4022 / 4023 / 4024 / 4025

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	70	12.87
	<i>Diplorhynchus condylocarpon</i>	28	15.34
	<i>Brachystegia manga</i>	38	10.85
	<i>Brachystegia manga</i>	49	3.75
DBH < 20 cm	<i>Oldfieldia dactylophylla</i>	18	8.40
	<i>Pseudolachnostylis maprouneifolia</i>	14	4.28
	<i>Monotes africanus</i>	6	4.16
	<i>Vitex mombassae</i>	13	3.40

Sampling point 43

Coordinates: S 6°61250 / E 31°77320

Slope: +/- flat

Dominant tree height: 10-12 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4026 / 4027 / 4028 / 4029

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	34	16.80
	<i>Brachystegia manga</i>	35	10.65
	<i>Lannea schimperi</i>	28	28.00
	<i>Pterocarpus tinctorius</i>	57	13.10
DBH < 20 cm	<i>Pterocarpus angolensis</i>	6	4.60
	<i>Pseudolachnostylis maprouneifolia</i>	19	3.88
	<i>Julbernardia globiflora</i>	5	3.66
	<i>Brachystegia manga</i>	4	1.90

Sampling point 44

Coordinates: S 6°61356 / E 31°77159

Slope: +/- flat

Dominant tree height: 6-8 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4031 / 4032 / 4033 / 4034

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	30	20.47
	<i>Brachystegia manga</i>	31	36.30
	<i>Brachystegia glaucescens</i>	48	14.38
	<i>Combretum molle</i>	25	42.30
DBH < 20 cm	<i>Julbernardia globiflora</i>	10	2.86
	<i>Flacourtia indica</i>	4	2.00
	<i>Julbernardia globiflora</i>	4	2.90
	<i>Julbernardia globiflora</i>	4	4.68

Sampling point 45

Coordinates: S 6°61569 / E 31°76971

Slope: +/- flat

Dominant tree height: 10-12 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4042 / 4043 / 4044 / 4045

Disturbances/notes: + 180 steps (1) tree cut for honey (>3 years)

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Julbernardia globiflora</i>	22	23.05
	<i>Pericopsis angolensis</i>	54	5.70
	<i>Julbernardia globiflora</i>	82	15.63
	<i>Julbernardia globiflora</i>	61	8.50
DBH < 20 cm	<i>Combretum fragrans</i>	3	4.81
	<i>Diplorhynchus condylocarpon</i>	12	3.72
	<i>Pseudolachnostylis maprouneifolia</i>	13	4.96
	<i>Diplorhynchus condylocarpon</i>	9	3.75

Sampling point 46

Coordinates: S 6°61701 / E 31°76800

Slope: +/- flat

Dominant tree height: 10-12 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4046 / 4047 / 4048 / 4049

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Monotes africanus</i>	29	21.70
	<i>Monotes africanus</i>	25	7.34
	<i>Brachystegia manga</i>	37	15.05
	<i>Monotes africanus</i>	38	8.25
DBH < 20 cm	<i>Julbernardia globiflora</i>	6	1.63
	<i>Pseudolachnostylis maprouneifolia</i>	10	6.04
	<i>Brachystegia manga</i>	4	6.59
	<i>Julbernardia globiflora</i>	4	3.45

Sampling point 47

Coordinates: S 6°61835 / E 31°76674

Slope: +/- flat

Dominant tree height: 10-12 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4053 / 4054 / 4055 / 4056

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Erythrophleum africanum</i>	23	12.75
	<i>Borassus aethiopum</i>	55	17
	<i>Brachystegia manga</i>	80	17.80
	<i>Brachystegia spiciformis</i>	50	17.35
DBH < 20 cm	<i>Flacourtia indica</i>	13	3.65
	<i>Phyllocosmus leimareanus</i>	5	5.40
	<i>Lannea schimperi</i>	16	2.47
	<i>Hymenocardia acida</i>	4	1.80

Sampling point 48

Coordinates: S 6°61998 / E 31°76550

Slope exposure: SW avec azimuth 227 (N)

Dominant tree height: 10 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4064 / 4065 / 4066 / 4067

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Brachystegia manga</i>	25	16.20
	<i>Brachystegia manga</i>	23	13.05
	<i>Brachystegia manga</i>	44	14.60
	<i>Brachystegia manga</i>	53	9.90
DBH < 20 cm	<i>Flacourtia indica</i>	6	8.00
	<i>Ximenia caffra</i>	4	10.33
	<i>Brachystegia manga</i>	4	2.10
	<i>Combretum molle</i>	18	2.48

Sampling point 49

Coordinates: S 6°62115 / E 31°76402

Slope exposure: SW avec azimuth 227 (N)

Dominant tree height: 12-14 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4068 / 4069 / 4070 / 4071

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Combretum collinum</i>	26	10.47
	<i>Monotes africanus</i>	45	10.77
	<i>Julbernardia globiflora</i>	29	3.80
	<i>Kigelia africana</i>	30	22.71
DBH < 20 cm	<i>Diplorhynchus condylocarpon</i>	13	3.40
	<i>Diplorhynchus condylocarpon</i>	6	2
	<i>Ximenia caffra</i>	3	3.90
	<i>Pseudolachnostylis maprouneifolia</i>	15	7.30

Sampling point 50

Coordinates: S 6°62278 / E 31°76323

Slope exposure: NORD

Dominant tree height: 10 m

Basal area (Bitterlich, k=1): not recorded

Photos: 4072 / 4073 / 4074 / 4075

Disturbances/notes:

Diameter class	Nearest species in each quarter	DBH (cm)	Distance (m)
DBH ≥ 20 cm	<i>Pterocarpus angolensis</i>	32	6.70
	<i>Brachystegia microphylla</i>	39	20.00
	<i>Brachystegia microphylla</i>	25	17.05
	<i>Julbernardia globiflora</i>	29	16.65
DBH < 20 cm	<i>Hymenocardia acida</i>	5	3.70
	<i>Brachystegia microphylla</i>	7	0.86
	<i>Brachystegia microphylla</i>	5	2.04
	<i>Terminalia kaiseriana</i>	15	3.20

Appendix C: Tree and shrub checklist Mlele BKZ (27/3/2019)

Plant list revised and amended from Mwangulango 2004

Scientific name	Kikonongo
<i>Acacia gerrardii</i>	Ulula
<i>Acacia polyacantha</i>	Muwombwe
<i>Acacia stuhlmannii</i>	Nunga?
<i>Azalia quanzensis</i>	Mkola
<i>Albizia antunesiana</i>	Mpilipili
<i>Albizia glaberrima</i>	
<i>Albizia grandibracteata</i>	
<i>Albizia gummifera</i>	
<i>Albizia harveyi</i>	
<i>Albizia versicolor</i>	Masako
<i>Anisophyllea pomifera</i>	Msindwi
<i>Annona senegalensis</i>	Mfilafila
<i>Antidesma membranaceum</i>	Msekela
<i>Azanza garckeana</i>	Mtowo
<i>Bauhinia thonningii</i>	Mfundwa mbogo
<i>Bobgunnia madagascariensis</i>	Kasanda
<i>Borassus aethiopum</i>	Sandala
<i>Brachystegia boehmii</i>	
<i>Brachystegia floribunda?</i>	Msilanga
<i>Brachystegia glaucescens</i>	Myombo
<i>Brachystegia microphylla</i>	Mkongolo
<i>Brachystegia spiciformis</i>	Mtundu / Umtundu
<i>Brachystegia stipulata</i>	
<i>Brachystegia utilis/floribunda/manga?</i>	Msilanga
<i>Brachystegia taxifolia</i>	Kapepe
<i>Bridelia duvigneaudii</i>	
<i>Bridelia scleroneura</i>	
<i>Burkea africana</i>	Mgandosinsi
<i>Cassia abbreviata</i>	Mzoka
<i>Cassia singueana</i>	Mzoka
<i>Cassipourea mollis</i>	Mlugala
<i>Catunaregam spinosa</i>	Mpongole
<i>Chrysophyllum bangweolense</i>	
<i>Combretum collinum</i>	Mlandala
<i>Combretum fragrans</i>	Mlozyaminze / Mluziaminzi
<i>Combretum molle</i>	Mlama
<i>Combretum zeyheri</i>	Msana
<i>Commiphora africana</i>	Mponda
<i>Crossopteryx febrifuga</i>	Msanza
<i>Dalbergia nitidula</i>	Kapondalampassa, Mzoka?
<i>Dichrostachys cinerea</i>	Kasunzulu
<i>Diospyros cornii</i>	Mnumbulu
<i>Diplorhynchus condylocarpon</i>	Msonga
<i>Dombeya rotundifolia</i>	Mlalila
<i>Ekebergia capensis</i>	Mtuzya
<i>Elaeodendron schweinfurthianum</i>	
<i>Entada abyssinica</i>	Mfutwamvula / Kamchicha
<i>Eriosema sp.</i>	
<i>Erythrina abyssinica</i>	Kamchicha
<i>Erythrophleum africanum</i>	Mgandongoye
<i>Euphorbia matabelensis</i>	Kiponda

<i>Flacourtia indica</i>	Msungu
<i>Friesodielsia obovata</i>	Msalansi
<i>Garcinia huillensis</i>	Myeye
<i>Grewia bicolor</i>	Mkoma
<i>Hexalobus monopetalus</i>	Mukua, Mkuwa?
<i>Hymenocardia acida</i>	Kapala
<i>Isobertia angolensis</i>	Mnembela
<i>Julbernardia globiflora</i>	Muva
<i>Kigelia africana</i>	Mdungwa
<i>Lannea schimperi</i>	Mgumbu
<i>Lonchocarpus capassa</i>	Mvalevale
<i>Maprounea africana</i>	
<i>Maranthes floribunda</i>	Mwasha
<i>Markhamia obtusifolia</i>	Mpapa
<i>Maytenus senegalensis</i>	Mwesia
<i>Memecylon flavovirens</i>	Mseweye
<i>Monanthes discolor</i>	Mshenene
<i>Monotes africanus</i>	Mkokote
<i>Monotes katangensis</i>	Mukokoti
<i>Multidentia crassa</i>	Mukukumba
<i>Mundelea sericea</i>	
<i>Mystroxydon aethiopicum</i>	Kasela
<i>Ochna afzelii</i> ssp. <i>afzelii</i>	
<i>Ochna holstii</i>	
<i>Ochna inermis</i>	
<i>Ochna oxyphylla</i>	
<i>Olax obtusifolia</i>	Mtundwa
<i>Oldfieldia dactylophylla</i>	Mliwamfwengi
<i>Ozoroa insignis</i> subsp. <i>reticulata</i>	Mkalakala
<i>Parinari curatellifolia</i>	Mbula/Mhula
<i>Pavetta stuhlmannii</i>	
<i>Pericopsis angolensis</i>	Mbanga
<i>Phyllanthus engleri</i>	Mng'ongomtandala
<i>Phyllocosmus leimareanus</i>	Msonifya
<i>Pleurostylia africana</i>	
<i>Protea madiensis</i>	
<i>Pseudolachnostylis maprouneifolia</i>	Mtungulu
<i>Psorospermum febrifugum</i>	Mvivi
<i>Pterocarpus angolensis</i>	Mninga
<i>Pterocarpus tinctorius</i>	Mkulungu
<i>Rhus longipes</i>	Msilanswagalo
<i>Rhus vulgaris</i>	Kankiningi
<i>Rytigynia decussata</i>	
<i>Rytigynia uhligii</i>	Msongwansimba
<i>Rothmannia engleriana</i>	Mlozilozi
<i>Schrebera trichoclada</i>	Mputeka
<i>Sclerocarya birrea</i>	
<i>Securidaca longepedunculata</i>	Mteywe
<i>Sterculia africana</i>	Msawala
<i>Sterculia quinqueloba</i>	Mkungulanga / Msavala / Msawala
<i>Stereospermum kunthianum</i>	
<i>Strychnos innocua</i>	Mkulwa
<i>Strychnos potatorum</i>	Mnyekenyeke, Mgwegue
<i>Strychnos pungens</i>	Mkome?
<i>Strychnos spinosa</i>	Katonga, Mwaye
<i>Syzygium guineense</i>	Kashamongo
<i>Tamarindus indica</i>	
<i>Terminalia kaiseriana</i>	Kazima

<i>Terminalia mollis</i>	Mfufu
<i>Trichilia emetica</i>	Mkalya
<i>Uapaca kirkiana</i>	Mkusu
<i>Uapaca nitida</i>	Mkokofinyo
<i>Vangueria madagascariensis</i>	Mgelelya
<i>Vitex doniana</i>	Mfuru
<i>Vitex fischeri?</i>	
<i>Vitex madiensis</i>	Mfululegea
<i>Vitex mombassae</i>	Mfululegea
<i>Vitex payos</i>	Mtalali
<i>Xeroderris stuhlmannii</i>	
<i>Ximenia americana?</i>	Mtundwa
<i>Ximenia caffra</i>	Kaguvaguva
<i>Ziziphus mucronata</i>	Kagaole

Appendix D: Vegetation survey 2018 of Mlele Beekeeping Zone

