

# **Biodiversity surveys in the Forest Reserves of the Uluguru Mountains**

Part II: Descriptions of the biodiversity of individual  
Forest Reserves

**Nike Doggart  
Jon Lovett, Boniface Mhoro, Jacob Kiure  
and Neil Burgess**



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## 1) Introduction to Part II

This report is the second part of a two part report describing the results of biodiversity surveys in 11 Forest Reserves conducted by the Uluguru Mountains Biodiversity Conservation Project in 2000 with additional data on Uluguru North and Kimboza Forest Reserves. The first part of the report provides an overview of the results of the surveys. In this second part of the report, it provides a description of each individual reserve arranged under the following categories:

### 1.2.1 Legal Information

- Name of the Forest Reserve, with the name spelt as in the official gazettelement notice.
- Administrative location of the reserve by district and region.
- Year of establishment. In many cases this is not clear, as a lot of Forest Reserves were established during the period of German administration and then declared again during the period of British Administration.
- Declaration: Legal details of gazettelement, including reference to the relevant Government Notice (GN) when possible. Otherwise reference is given to the Forest Ordinance cap 132.
- Variation order: Legal details of any variation orders with reference to the relevant Government Notice (GN) when possible.

### 1.2.2 Mapping information

- Border map: Details of border maps with their Jb number, scale and date.
- Topographic maps: Sheet reference numbers to the national 1:50 000 map series Y742.

### 1.2.3 Area and boundary information

- Gazetted area: Area of the reserve in the official gazettelement with conversion to hectares when necessary.
- Measured area: Area of the reserve as measured by remote sensing or aerial survey when available.
- Gazetted boundary length: Length of the reserve boundary as given in the official gazettelement or border map schedule with conversion to kilometres when necessary.
- Measured boundary length: Length of the reserve boundary as measured by remote sensing or aerial survey when available.

### 1.2.4 Map

A sketch map showing the reserve boundary, contours, forest extent, rivers and villages is included. These are based on topographical maps, border maps (with the exception of Mkungwe where the location of the reserve boundary has been corrected) combined with results of the assessment of forest extent undertaken by the UMBCP surveys.

### 1.2.5 Location

- Latitude and longitude determined from 1:50 000 topographical maps. Approximate distance in kilometres from the nearest towns. Access to the

reserve, or parts of the reserve. A brief description of the area covered by the reserve with its elevation range. When necessary, we provide notes on errors of reserve location on the 1:50 000 topographical maps.

### 1.2.6 Vegetation

A description of the vegetation is given, followed by more detailed accounts of each vegetation type. If elephant and/or buffalo occur or landslides are frequent, this is indicated. Names of plant species generally follow those used in the Flora of Tropical East Africa. The vegetation types used are:

- Grassland: area of grass where there is little or no woody vegetation.
- Woodland: wet woodland is usually dominated by *Brachystegia*. Dry woodland is usually dominated by *Acacia*.
- Forest: the forest types used are an elevation gradient of lowland, submontane, montane to upper montane; with wetter or drier types. Ground water forest grows on areas where the water table is close to the surface, often in rainfall lower than is normal for the species in it. Similarly, mist forest is supported by water derived from cloud and mist. Riverine forest is closed canopy forest growing along the edge of perennial water courses. This is most distinctive in the lowland areas.

Actual altitudes and rainfall determining the different forest types is dependent on local variations in temperature and dry season length but an approximate summary is given in Table 1.

**Table 1.** Approximate elevation and rainfall ranges for different forest types in Tanzania.

<b>Forest type</b>	<b>Altitude (m)</b>	<b>Rainfall (mm)</b>
Dry lowland	0 - 800	1000 - 1500
Lowland	0 - 800	>1500
Dry Submontane	800 - 1250	1500 - 2000
Submontane	800 - 1250	>2000
Dry montane	1250 - 2900	900 - 1500
Montane	1250 - 1800	>1500
Upper Montane	1800 - 2900	>1500

(From Lovett and Pócs 1993)

When vegetation types are known to be secondary or in an early successional stage this is indicated.

A list of the plant species collected during the UMBCP surveys is presented for each reserve.

### 1.2.7 Mammals, Birds, Reptiles and Amphibians

For each order there is a checklist of species that have been recorded based on the findings of the current survey and other recent surveys. This is accompanied by a brief summary.

### 1.2.8 Biodiversity

Highlights of the reserve's biodiversity are described here including species of particular interest or those with value as indicators of biodiversity.

#### 1.2.9 Catchment Values

A brief description of the reserve's catchment values is given, with notes on uses of the water originating from the reserve.

#### 1.2.10 Human Impacts

A brief description of human disturbance and utilisation of the forest is given.

#### 1.2.11 Management Proposals

A brief outline of possible management needs is given.

#### 1.2.12 Literature

A list of references relevant to the reserve is presented.

## 2) Forest Reserve descriptions

### 2.1 *Bunduki I and III Catchment Forest Reserves*

Morogoro District, Morogoro Region

Morogoro Division

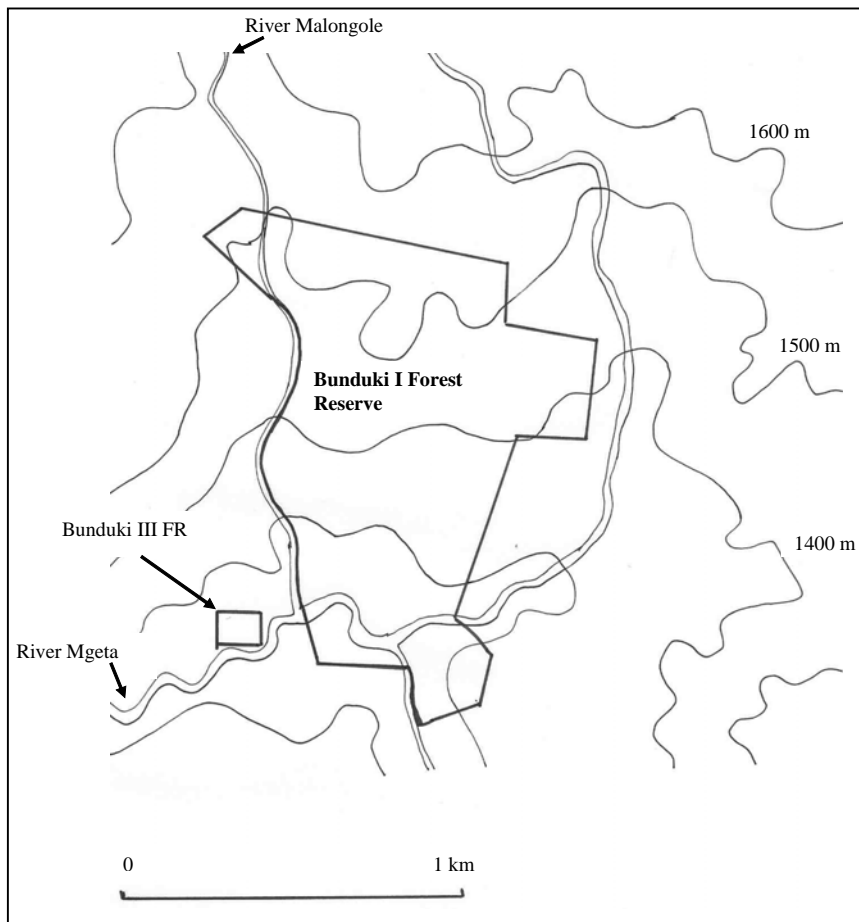
Year of establishment	:	Not in forestry database
Declaration	:	Cap. 132/1950 p. 1357
Variation order	:	GN 44 of 1/3/1946
Border map	:	Jb 680 (1:5000) 1966, Jb 86 (1:10 000)
Topographical map	:	201/1
Gazetted area	:	Bunduki I, 102 ha; Bunduki III, 3 ha
Gazetted boundary length	:	Bunduki I, 4.9 km (plus some distance along the Mungulu River); Bunduki III, 0.7 km

#### 2.1.1 Location

7° 01' S 37° 38' E

10 km from Mgeta via Bunduki Village. Bunduki I covers the slope and valley of the Mgeta river from 1220 to 1540 m, and Bunduki III is a small reserve on level ground by the Mgeta river south west of Bunduki I at 1220 m. Bunduki I is marked on the topographical map as Vinile FR.

**Figure 1.** Location map of Bunduki Forest Reserve





### 2.1.2 Vegetation

Bunduki I is mostly a plantation of *Pinus* spp., *Eucalyptus* spp., bamboo, *Cupressus* spp., *Grevillea robusta* and avocado. In the undergrowth beneath the plantation, and occasionally within the plantation itself, montane forest trees and shrubs occur. Bunduki III is a small patch of montane or submontane forest on a swampy area by the river.

Montane forest: Trees to 20 m including: *Alangium chinense*, *Albizia gummifera*, *Anthocleista grandiflora*, *Bersama abyssinica*, *Cussonia spicata*, *Cylicomorpha parviflora*, *Draceana steudneri*, *Ficus sur*, *Harungana madagascariensis*, *Parinari excelsa*, *Polyscias fulva*, *Rauvolfia caffra*, *Syzygium guineense* subsp. *afromontanum*.

Of the 33 botanical specimens collected in Bunduki 26 have been identified to species level (Table 2). These include 26 species from 20 families.

No plant species with ranges restricted to the Eastern Arc and Coastal forests were collected in Bunduki F.R. during this survey.

**Table 2.** Annotated list of plant species collected in Bunduki Forest Reserve.

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<b>ACANTHACEAE</b>					
<i>Brillantaisia madagascariensis</i>	T. Anderson ex Lindau	940 - 1300	T1,2,3,5,6; Sudan, Ethiopia; Madagascar	Shrub	
<i>Dicliptera mossambicensis</i>	Klotzsch	350 - 1200	K7; T6; Malawi, Zambia, Zimbabwe and Mozambique	Climber	
<i>Hypoestes triflora</i>	(Forssk.) Roem. & Schult.	1300	T2,3,6,7; Malawi; Cameroon	Herb	
<i>Thunbergia alata</i>	Bojer ex Sims	100 - 2000	U2-4; K1-7; T1-8; Z; pantropical	Creeping herb	
<b>ANACARDIACEAE</b>					
<i>Trichoscypha uluguruensis</i>	Mildbr.	1200 - 1800	T4, 6-8; S. Zaire, Mozambique, Malawi, Zambia, Zimbabwe and Angola	Tree	Upland rain-forest, riverine forest.
<b>APOCYNACEAE</b>					
<i>Carvalhoa campanulata</i>	K. Schum.	350	K7; T3,6,7; Malawi	Shrub	
<i>Rauvolfia mannii</i>	Stapf	300 - 2440	U2; K4,7; T2,3,6-8; Burundi, Rwanda, Zaire, Central African Republic, Gabon, Cameroon, Nigeria, Ghana	Tree	
<b>ASTERACEAE</b>					
<i>Solanecio mannii</i>	(Hook. f.) C. Jeffrey		U1-4; K1-7; T1-8; Cameroon	Shrub or tree	
<b>CAMPANULACEAE</b>					
<i>Lobelia baumannii</i>	Engl.	800 - 2400	K4; T2-4, 6-8; E. Zaire, Burundi, Zambia, Malawi, Zimbabwe and Mozambique.	Perennial herb	Forest floor or forest margins, often on rocks or stream banks in shade
<b>CONVOLVULACEAE</b>					
<i>Ipomoea involucrata</i>	P. Beauv.	100 - 2700	U2,3; K6 ; T 1-8; Z;	Herb	Grassland, forest,

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
			Throughout tropical Africa from West Africa to Angola and northern Transvaal.		Brachystegia woodland and abandoned cultivated ground.
ERICACEAE					
<i>Agarista salicifolia</i>	(Comm. ex Lam.) G. Don			Shrub or tree	
FABACEAE					
<i>Vigna fischeri</i>	Harms	1000 - 2250	K4,5; T2,3,6-8; Cameroon, Burundi, Ethiopia, Malawi and Zambia	Perennial herb	Swampy grassland with scattered shrubs, upland grassland with scattered trees, forest edges, old cultivations.
FLACOURTIACEAE					
<i>Oncoba welwitschii</i>	Oliv.	800 - 1900	T3,6-8; Nigeria to Zaire and Angola also in Malawi and Mozambique	Shrub or tree	Lower storey of rain forest, dry evergreen forest and riverine forest, also in secondary growth.
GESNERIACEAE					
<i>Streptocarpus glandulosissimus</i>	Engl.	2700	U2; K1,4,7; T2,3,6,7; Rwanda, Burundi	Herb	
LILIACEAE					
<i>Asparagus asparagoides</i>	(L.) Druce		K4,7; T7; Burundi, Zaire, S. Africa	Climber	
LOGANIACEAE					
<i>Anthocleista grandiflora</i>	Gilg			Tree	
MELASTOMATACEAE					
<i>Tristemma mauritianum</i>	J. F. Gme	775 - 1950	U1-4; K5,7; T1,3,4,6,8; P; widespread in tropical Africa from Senegal eastwards to Ehtiopia and southward to Angola, Rhodesia and Mozambique, also in Madagascar and Mascarene Island	Herb	Marshy clearings in rain-forest, swampy riverine forest
MONIMIACEAE					
<i>Xymalos monospora</i>	(Harv.) Baill. ex Warb.	900 - 2700	U1-4; K1, ?2; 3-7; T1-4, 6, 7; eastern Africa from Sudan Republic and eastern Congo Republic to South Africa, also Cameroon Highlands and Fernando Po.	Shrub or small tree	Lowland and upland rain forest, often a co-dominant in forests on isolated mountain-tops in dry country
MORACEAE					
<i>Ficus thonningii</i>	Bl.	350 - 2500	U1-4; K1-7; T1-8; extending to Cape Verde Isl, Angola, Ethiopia and South Africa.	Tree	Forest, woodland, bushland and wooded grassland, sometimes along rivers and lakes or among rocks, planted for ornament and bark cloth.
PASSIFLORACEAE					
<i>Passiflora edulis</i>	Sims	0 - 2500	U4; K4; T2,3,6,7; widely	Climber	Often cultivated for the

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
			cultivated.		flavoured fruit and escaped in forest edges, thickets and distributed places.
<b>RHAMNACEAE</b>					
<i>Gouania longispicata</i>	Engl.	300 - 2400	U1-4; K3-5,7; T2-4, 6-8; Nigeria, Congo, Sudan, Rhodesia, Malawi, Mozambique	Climbing or crawling shrub or liane	Forests particularly at margins and in distributed places, riverine thickets and wooded grassland
<b>RUBIACEAE</b>					
<i>Keetia gueinzii</i>	(Sond.) Bridson	90 - 2450	U1-4; K2/3, 3-5/7; T1-8; Z; Cameroon, Central African Republic, Zaire, Rwanda, Burundi, Ethiopia, Malawi, Zambia, Zimbabwe, Angola and South Africa.	Shrub or liane	Forest and woodland, often on swampy ground
<i>Oxyanthus speciosus stenocarpus</i>	DC.	750 - 2300	U1-3; K1, 3-7, T2,3,5-8; Rwanda, Ethiopia, Mozambique, Zimbabwe and South Africa	Shrub or small tree	Forest
<i>Pauridiantha paucinervis holstii</i>	(Hiern) Bullock	500 - 2400	K3-5,7; T2-4,6,7; Zaire, Malawi and Zambia	Shrub or small tree	Lowland evergreen (including rain)forest, upland evergreen forest.
<b>SCROPHULARIACEAE</b>					
<i>Halleria lucida</i>	L.	1000 - 2500	U1; K1,3-6; T1,2,6; Ethiopia	Tree	
<b>SOLANACEAE</b>					
<i>Solanum terminale</i>	Forssk	1050 - 2300	U2,4; T3,4,8; Rwanda, Burundi	Shrub	

### 2.1.3 Mammals

Two species of mammal from two families were recorded in Bunduki.

**Table 3.** Checklist of the mammals of Bunduki.

Species	Common name
<b>GALAGONIDAE</b>	
<i>Otolemur garnettii</i>	Small-eared galago
<b>SCIURIDAE</b>	
<i>Paraxerus lucifer</i>	Tanganyika mountain squirrel

### 2.1.4 Birds

A total of 44 species of bird from 23 families were recorded.

**Table 4.** Checklist of the birds of Bunduki.

Species	Common name	Most recent record
<b>SCOPIIDAE</b>		
<i>Scopus umbretta</i>	Hamerkop	UMBCP 2000
<b>ACCIPITRIDAE</b>		
<i>Polyboroides typus</i>	African harrier hawk	UMBCP 2000
<i>Accipiter tachiro</i>	African goshawk	UMBCP 2000
<i>Accipiter minullus</i>	Little sparrowhawk	UMBCP 2000

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Buteo oreophilus</i>	Mountain buzzard	UMBCP 2000
<b>COLUMBIDAE</b>		
<i>Columba arquatrix</i>	Olive pigeon	UMBCP 2000
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's turaco	UMBCP 2000
<b>STRIGIDAE</b>		
<i>Strix woodfordii</i>	African wood owl	UMBCP 2000
<b>APODIDAE</b>		
<i>Apus affinis</i>	Little swift	UMBCP 2000
<b>TROGONIDAE</b>		
<i>Apaloderma vittatum</i>	Bar-tailed trogon	UMBCP 2000
<b>BUCEROTIDAE</b>		
<i>Tockus albiterminatus</i>	Crowned hornbill	UMBCP 2000
<i>Bycanistes bucinator</i>	Trumpeter hornbill	UMBCP 2000
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	UMBCP 2000
<b>CAPITONIDAE</b>		
<i>Stactolaema olivacea</i>	Green barbet	UMBCP 2000
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	UMBCP 2000
<b>INDICATORIDAE</b>		
<i>Indicator variegatus</i>	Scaly-throated honeyguide	UMBCP 2000
<i>Indicator minor</i>	Lesser honeyguide	UMBCP 2000
<b>PICIDAE</b>		
<i>Dendropicos griseocephalus</i>	Olive woodpecker	UMBCP 2000
<b>PYCNONOTIDAE</b>		
<i>Andropadus virens</i>	Little greenbul	UMBCP 2000
<i>Andropadus masukuensis</i>	Shelley's greenbul	UMBCP 2000
<i>Andropadus nigriceps</i>	Mountain greenbul	UMBCP 2000
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	UMBCP 2000
<i>Pycnonotus barbatus</i>	Common bulbul	UMBCP 2000
<b>TIMALIIDAE</b>		
<i>Pseudoalcippe abyssinica</i>	African hill babbler	UMBCP 2000
<b>TURDIDAE</b>		
<i>Pogonochila stellata</i>	White-starred robin	UMBCP 2000
<i>Alethe fuelleborni</i>	White-chested alethe	UMBCP 2000
<b>SYLVIIDAE</b>		
<i>Bradypterus lopezi</i>	Evergreen forest warbler	UMBCP 2000
<i>Bathmocercus winifredae</i>	Mrs Moreau's warbler	UMBCP 2000
<i>Apalis flavida</i>	Yellow-breasted apalis	UMBCP 2000
<i>Apalis thoracica</i>	Bar-throated apalis	UMBCP 2000
<i>Orthotomus metopias</i>	Red-capped forest warbler	UMBCP 2000
<b>MONARCHIDAE</b>		
<i>Trochocercus albonotatus</i>	Whitetailed crested flycatcher	UMBCP 2000
<i>Terpsiphone viridis</i>	Paradise flycatcher	UMBCP 2000
<b>PLATYSTEIRIDAE</b>		
<i>Batis mixta</i>	Forest batis	UMBCP 2000
<b>MALACONOTIDAE</b>		
<i>Laniarius fuelleborni</i>	Fulleborn's black boubou	UMBCP 2000
<i>Dryoscopus cubla</i>	Black-backed puffback	UMBCP 2000
<b>CORVIDAE</b>		
<i>Corvus albicollis</i>	White-naped raven	UMBCP 2000
<b>STURNIDAE</b>		
<i>Onychognathus walleri</i>	Waller's starling	UMBCP 2000
<i>Onychognathus morio</i>	Red-winged starling	UMBCP 2000
<b>NECTARINIIDAE</b>		
<i>Anthreptes collaris</i>	Collared sunbird	UMBCP 2000

Species	Common name	Most recent record
<i>Nectarinia olivacea</i>	Olive sunbird	UMBCP 2000
ESTRILDIDAE		
<i>Cryptospiza reichenovii</i>	Red-faced crimsonwing	UMBCP 2000
<i>Lonchura cucullata</i>	Bronze mannikin	UMBCP 2000
FRINGILLIDAE		
<i>Serinus hypostictus</i>	African citril	UMBCP 2000

### 2.1.5 Reptiles

A total of eight species of reptile from four families were recorded.

**Table 5.** Checklist of the reptiles of Bunduki.

Species	Common name	Most recent record
GEKKONIDAE		
<i>Hemidactylus platycephalus</i>	Baobab gecko	UMBCP 2000
<i>Urocotyledon wolterstorffi</i>		UMBCP 2000
CHAMAELEONIDAE		
<i>Bradypodion fischeri uluguruensis</i>	Uluguru two-horned chameleon	UMBCP 2000
<i>Bradypodion oxyrhinum</i>	Uluguru one-horned chameleon	UMBCP 2000
<i>Chamaeleo werneri</i>	Werner's three-horned chameleon	UMBCP 2000
<i>Rhampholeon brevicaudatus</i>	Bearded pigmy chameleon	UMBCP 2000
SCINCIDAE		
<i>Melanoseps cf ater</i>		UMBCP 2000
<i>Mabuya varia</i>	Variable skink	UMBCP 2000
COLUBRIDAE		
<i>Crotaphopeltis tornieri</i>	Tornier's cat snake	UMBCP 2000

### 2.1.6 Amphibians

Four amphibian species from three families were recorded. The *Leptopelis* sp. is similar to *L. uluguruensis* but the webbing is too extensive. The specimen awaits further analysis.

**Table 6.** Checklist of the amphibians of Bunduki.

Species	Most recent record
ARTHROLEPTIDAE	
<i>Arthroleptis xenodactyloides</i>	UMBCP 2000
HYPEROLIDAE	
<i>Hyperolius puncticulatus</i>	UMBCP 2000
<i>Leptopelis</i> sp.	UMBCP 2000
MICROHYLIDAE	
<i>Callulina krefftii</i>	UMBCP 2000

### 2.1.7 Biodiversity

Although most of the area is a plantation of exotics, some bird, reptile and amphibian species of restricted distribution remain in the reserves. Bunduki III is just downstream of the reserve, in the Mgeta valley. It is a small patch of submontane riverine forest that is of traditional cultural importance, and which may also contain some species of restricted distribution.

### 2.1.8 Catchment values

The reserves protect part of the Mgeta river catchment.

#### 2.1.9 Human impacts

The reserve is largely converted to exotic plantations, some of which are presently being harvested. Firewood and building poles are also taken from the reserve. The reserve is a useful seed source for exotic tree species that can be grown in farmlands.

Chameleons and butterflies have been collected for trade and larger mammals appear to be very scarce probably as a result of the combined pressures of habitat loss and hunting.

A small number of tourists are beginning to visit the reserve. Visitor numbers are probably no more than 20 per year. They stay at the Bunduki Fly Fishing Lodge and visit the forest and spectacular Hululu Falls in the neighbouring Uluguru South Forest Reserve. In general they are specialist tourists interested in seeing birds particularly Mrs Moreau's warbler and Loveridge's sunbird.

There is a road through the reserve, which was being improved in August 2000. The government plans for this road to connect with roads on the Eastern side of the Ulugurus via Lanzi.

#### 2.1.10 Management proposals

Bunduki is a 6 to 7 hour drive from Dar es Salaam on reasonable roads for most of the way and as such there is potential to increase tourism to this area. At present the Bunduki Fly Fishing Lodge offers very basic accommodation. With a small amount of investment the lodge could be improved to attract a greater number of visitors. Ownership of the lodge is under dispute between the current tenant who acts as a guide for visitors, the village government and the Forest and Beekeeping Division. This should be resolved if tourism is to continue.

According to 1955 aerial photographs Bunduki was part of a narrow stretch of forest linking the northern Uluguru forests with those of the South. As such it is a priority area for reforestation using indigenous trees to re-connect the two forests.

#### 2.1.11 Literature

Lovett, J.C. & T. Pócs (1993). Assessment of the condition of the Catchment Forest Reserves, a botanical appraisal. Catchment Forestry Report 93.3, Dar es Salaam. 300 pp.

## 2.2 *Kasanga Local Authority Forest Reserve*

Morogoro District, Morogoro Region

Morogoro Division

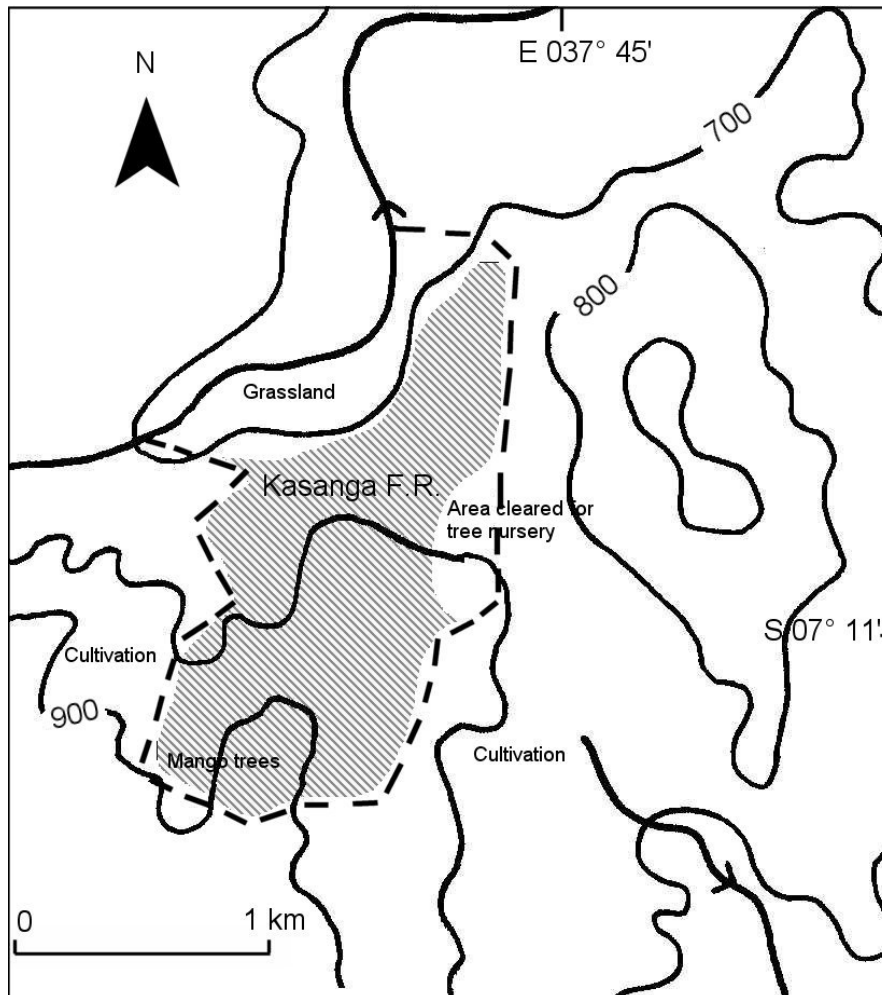
Year of establishment	:	1907
Declaration	:	Sch 1907
Variation order	:	
Border map	:	JB 190
Topographical maps	:	201/1 and 201/2
Gazetted area	:	70
Gazetted boundary length	:	

### 2.2.1 Location

07°10' S 037°45' E

1 km north of Kasanga Village. After Mvuha on the Morogoro - Kisaki road, turn towards Kolero. Beyond Kolero the road is passable in the dry season as far as Kasanga Mission. Walk from the mission. The reserve covers a gentle north-facing slope from 660 m to 940 m asl east of Kimhandu Peak in Uluguru South Forest Reserve. In the north it is bordered by the Msuluzi River and in the west by the Mto Mkwega, a small permanent stream.

**Figure 2.** Sketch map of Kasanga Forest Reserve



## 8.2.2 Vegetation

There is a mix of submontane forest and plantation forest. On the steep slopes above the Msuluzi River all forest has been burnt leaving an area of grass and scrub. Submontane forest begins in the north of the reserve at 720 m. Trees include *Syzygium guineense*, *Albizia gummifera* and *Spirostachys africana*. *Parinari* sp. and *Podocarpus* sp. are present but are not common. *Dracaena* sp. is dominant in the understory close to the river. During the German colonial administration the native *Khaya anthotheca* was planted in the centre of the reserve and the introduced *Mangifera indica* (mango) in the south. These are still dominant in those areas. Other exotics planted include cocoa *Theobroma cacao*.

Of the 71 botanical specimens collected in Kasanga 60 have been identified to species level (Table 7). These include 53 species from 25 families.

Plant species or varieties recorded in Kasanga F.R. with ranges restricted to FTEA regions T3, K7, T6, T8, Z and P (i.e. the FTEA regions that include the Eastern Arc and Coastal Forests) include *Gossypioides kirkii*, *Pavetta crebrifolia* var. *kimbozensis* and *Leptonychia usambarensis*.

**Table 7.** Annotated list of plant species collected in Kasanga F.R.

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<b>ACANTHACEAE</b>					
<i>Justicia tenella</i>	(Nees) T. Anderson	750	T6; P; Zaire; Central African Republic, W. Africa, Madagascar	Herb	
<i>Mellera lobulata</i>	S. Moore	600 - 1000	U2; T1,3,4,6; Ethiopia, Malawi	Shrub	
<b>APIACEAE</b>					
<i>Centella asiatica</i>	(L.) Urb.	0 - 3480	U1-4; K1-7; T1-8; Z; P; Pantropical	Herb or creeper	Most commonly in damp grassland along rivers and by swamps and lakes
<b>APOCYNACEAE</b>					
<i>Carvalhoa campanulata</i>	K. Schum.	350	K7; T3,6,7; Malawi	Shrub	
<b>ASCLEPADACEAE</b>					
<i>Cryptolepis obtusa</i>	N. E. Br.	750 - 1100	T6; Malawi, Zambia	Climbing herb	
<b>ASTERACEAE</b>					
<i>Acmella uliginosa</i>	(Sw.) Cass			Herb	
<i>Ageratum conyzoides</i>	L.	700 - 1700	U3,4; K1-7; T2-5; Z;	Herb	
<i>Anisopappus chinensis</i>	Hook. & Arn.			Herb	
<i>Crassocephalum crepidioides</i>	(Benth.) S. Moore		U1-4; K1,3-7; T1-8;	Herb	
<i>Emilia caespitosa</i>	Oliv.		U2,4; K1,5,7;	Herb	
<i>Ethulia pauciflora</i>	M. G. Gilbert	125 - 900	T6,8; northern Mozambique	Annual herb	Moist sites in wooded grassland, usually on alluvium or black cotton soil
<i>Gynura valeriana</i>	Oliv.		K6; T2,3,6;	Shrub	



<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
<i>Helichrysum odoratissimum</i>	(L.) Sweet	1700 - 3700	U1-3; K3,5; T2,4,7; Zimbabwe, Malawi, Mozambique, S. Africa	Herb	
<i>Helichrysum traversii</i>	Chiov.	1850 - 3000	K2,3,5; T2,3,7; Ethiopia	Herb	
<i>Mikania chenopodifolia</i>	Willd.		U2; T3,4,7,8; Z; P; Rwanda, Zaire	Climbing herb	
<i>Solanecio angulatus</i>	(Vahl) C. Jeffrey		U1-4; K2-5,7; T1-8;	Climbing succulent herb	
<i>Vernonia aemulans</i>	Vatke	1 - 1900	K4,6,7; T2-4,6-8; not known elsewhere	Annual herb	Disturbed sites such as roadsides, old cultivations, also in grassland, woodland, wooded grassland and bushland
<i>Vernonia lasiopus var. iodocalyx</i>	O. Hoffm.	1050 - 2650	U2-4; K3,4,6,7; T1-3,5,6; Rwanda Sudan and Ethiopia	Woody herb or shrub	Forest clearings, forest margins, secondary bush derived form forest, riverine thicket, secondary grassland in forest or dry bush zone, roadsides maybe abundant in abandoned cultirabion
<b>BALSAMINACEAE</b>					
<i>Impatiens walleriana</i>	Hook. f.	0-2000	K7; T2,3,6; Z, P; Mozambique, S. Malawi, E. Zimbabwe	Succulent perennial	In damp often shaded places in upland and coastal rain-forest, particularly in riverine thickets, gullies and damp rocky places
<b>CAMPANULACEAE</b>					
<i>Lobelia fervens</i>	Thunb.	0 - 1780	K1, 4, 7; T1,3,4,6-8; Z; P; Ethiopia, zimbabwe, Mozambique, Comoro Isl, Madagascar, Reunion, Brazil.	Perennial herb	Grassland, forest margins, roadsides, stream sides or on coastal sand, often in damp places.
<b>CANNACEAE</b>					
<i>Canna indica</i>	L.	0 - 2500	U2-4; K3,4,7; T2-4,6,7; Z; P; Pantropical	Herb	Widespread in areas of high rainfall in disturbed places
<b>CLUSIACEAE</b>					
<i>Harungana madagascariensis</i>	Lam. ex Poir.	0 - 1800	U2-4; K4,5,7; T1,3,6,7; Z; P; widely spread throughout Tropical Africa.	Shrub	Lowland and upland rain forest
<b>CONVOLVULACEAE</b>					
<i>Hewittia malabarica</i>	(L.) Suresh			Climber	
<b>CUCURBITACEAE</b>					
<i>Peponium vogelii</i>	(Hook. f.) Engl.	80 - 2440	U2-4; K1,3-7; T1-3, 5-8; Z; west and Central tropical Africa from	Climber	Upland and lowland rain -and ground-water forest and upland

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
			Ghaua eastwards to Ethiopia and southwards through the Congo Republic to Angola; Mozambique; Seychelles.		bamboo thicket, also in woodland and bushland especially near open water.
<i>Zehneria scabra</i>	(L. f.) Sond.	80 - 3350	U1-4; K1-7; T1-8; Z; tropical Africa and South Africa, Arabia, peninsular India, Java, Philippines	Herb climbing or trailing	Rain and swamp or other ground water forest, riverine forest, grass thicket, seasonal swamp and damp places generally in bushland and woodland; also a weed of roadsides and plantations.
CYPERACEAE					
<i>Scleria racemosa</i>	Poir.		U1; K5,7; T3,4; Z; Ethiopia, Zimbabwe		
EUPHORBIACEAE					
<i>Shirakia elliptica</i>	(Hochst.) Kruijt			Tree	
FABACEAE					
<i>Crotalaria natalitia</i>	Meissn.	0 - 3000	U1-4; K1-7; T1-8; Z; Eastern Congo, Ethiopia, Mozambique, Malawi, Zambia, Rhodesia south to Natal, Angola.	Woody herb or small shrub	Deciduous woodland and bushland, riverine forest and margins of upland rainforest, upland grassland and evergreen bushland, also persisting on roadsides and cultivated ground.
<i>Desmodium tortuosum scabra</i>	(Sw.) DC.	0 - 1100	U4; T1-4, 6,8; throughout tropical and subtropical areas of America; introduced and naturalised throughout the tropics of the old world.	Herbaceous from a woody base.	Roadsides, grassy places, abandoned plantations.
<i>Indigofera trita</i>	L. f.	0 - 2200	U1,2; K1,2,4-7; T1-8; Z; P; Senegal to Ethiopia, Congo, Mozambique, Rhodesia, Angola, South West Africa, South Africa	Erect woody herb	Chiefly in secondary growth.
<i>Indigofera vohemarensis</i>	Baill.	0 - 1800	U1-4; K1-7; T1-8; Z; P; Congo, Ethiopia, Mozambique and Madagascar.	Erect annual or perennial	Grassy and stony slopes.
<i>Mucuna poggei pesa</i>	(De Wild.) Verdc.	360 - 1950	U2; K5; T3-8; Congo, Mozambique, Malawi, Rhodesia	Large liane	Bushland, riverine forest and swamp-forest.
<i>Rhynchosia hirta</i>	(Andr.)	0 - 1 800	U2-4; K3-7; T1-8; Z; P;	Creepers or	Forest edges, grassland

<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
	Meikle & Verdc.		widespread in tropical Africa from N. Nigeria and Sudan to Central Africa and NE. South Africa also in the Mascarene Islk, India and Ceylon	climber	with scattered trees, hillside bushland and cultivations;
<i>Senna petersiana</i>	(Bolle) J. M. Lock	12 - 2130	U1-4; K3,5; T1,4,6-8; Z; eastern Africa from Ehtiopia and the Sudan Republic southwards to Mozambique and the Trasvaal, extending westeards to Central African Republic and Cameroun Republic; also in Madagascar.	Shrub or tree	In or on edge of rain-froest, riverine forest, deciduous woodland, coastal evergreen bushland and wooded grassland.
<b>MALVACEAE</b>					
<i>Gossypioides kirkii</i>	(Mast.) Hutch.		T6,7,8;	Shrub	
<i>Sida javensis</i>	Cav.	50 - 1750	U1,2,3,4; K1-7; T7,8; Z; P; Zaire, Sudan, Ethiopia, Eritreaa	Herb	
<i>Sida rhombifolia</i>	L.			Small shrub	
<b>MELASTOMATACEAE</b>					
<i>Dissotis rotundifolia</i>	(Sm.) Triana	0 - 1900	U2-4; K7; T1,3,4, 6-8; Z; P; widespread in tropical Africa from Sierra Leone southwards to Angola and extending eastwards through Zaire and E. Africa to Rhodesia and Mozambique; introduced to Malesia	Herb	Margins of rain-forest, riverine forest, flood plains and valley grassland, swamps, upland grassland in moist places.
<b>MORACEAE</b>					
<i>Ficus sur</i>	Forssk	0 - 2300	U1-4; K1,3-7; T1-8; Z; P; extending to Yemen, Cape Verde Isl. Angola and South Africa.	Tree	Forest, riverine, wooded grassland, often left in cleared places.
<i>Ficus vallis-choudae</i>	Del.	450 - 1800	U1,2,4; K1-7; T 2-7	Tree	Riverine, lakesides, ground water forest.
<b>ORCHIDACEAE</b>					
<i>Calanthe sylvatica</i>	(Thouars) Lindl.			Tree	
<i>Platylepis glandulosa</i>	(Lindl.) Rchb. F.		U4; T3,7; Mozambique, Malawi, Zambia, Zaire, Sudan, W. Africa, Angola, S. Africa	Herb	
<b>POLYGALACEAE</b>					
<i>Polygala macrostigma</i>	Chodat	1200	T3,4,6,8;	Herb	
<b>ROSACEAE</b>					
<i>Rubus rosifolius</i>	Sm.	900 - 1450	U4; T2,3; a native of eastern Asia, introduced	Scrambling shrub	Edges of upland and lowland rain forests na

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
			into Africa and quite commonly naturalised.		plantations, secondary bushland, abandoned cultivations etc.
<b>RUBIACEAE</b>					
<i>Keetia venosa</i>	(Oliv.) Bridson	275 - 1525	U1,3,4; K7; T 1,3,4,6,8; W. Africa, Cameroon, Central African Republic, Zaire, Rwanda, Burundi, Sudan, Mozambique, Malawi, Zambia, Zimbabwe and Angola.	Shrub or climber	Forest edges and scrub.
<i>*Pavetta crebrifolia var. kimbozensis</i>	Hiern	400 - 460 (600)	T6; not known elsewhere.	Shrub or small tree	Forest on limestone
<i>Rubia cordifolia subsp. conotricha</i>	(Gand.) Verdc.	1140 - 2650	U1-4; K1-6; T1-8; Zaire, Sudan, Somali Republic, Mozambique; Malawi, Zambia, Rhodesia, Angola and South Africa (mostly Natal and Transvaal)	Herb	Mostly at forest edges, in clearings and thickets or less often in denser forest, open grassland and bushland also in scrubland and rocky gullies
<i>Rutidea orientalis</i>	Bridson	800 - 2250	U2-4; K3,5; T1,3,4,6,7; Zaire, Rwanda, Burundi, Mozambique, Malawi and Zimbabwe	Scandent shrub or climber	Forest, frequently at edges or in thickets;
<i>Tarenna pavettoides</i>	(Harv.)		T3,6,7,8; P; Mozambique, Malawi, Zimbabwe	Shrub or small tree	
<b>SAPOTACEAE</b>					
<i>Synsepalum brevipes</i>	(Bak.) Pennington	0 - 1500	U2,4; K4,5,7; T1,3,4,6-8; Z; P; widespread in tropical Africa from Portuguese Gambia to the Sudan Republic and south to Angola, Zambia, Angola, Zambia, Malawi, Mozambique and Rhodesia	Small to medium tree	Lowland rain forest and riverine forest, commonly found on river banks and margins of lakes or other such sites with a high permanent water table.
<b>STERCULIACEAE</b>					
<i>Leptonychia usambarensis</i>	K. Schum.			Tree or shrub	
<b>ULMACEAE</b>					
<i>Trema orientalis</i>	(L.) Blume	0 - 2100	U1-4; K1,3-7; T1-8; Z; P; throughout Africa south of the Sahara, Madagascar, Mascarene Isl and tropical Asia	Shrub or tree	Margins of lowland and upland rainforest, often a pioneer in clearings, also riverine forest.
<b>VITACEAE</b>					
<i>Cayratia gracilis</i>	(Guill. & Perr.) Suss.	300 - 1770	K1,3-5,7; T1-8; Z; Senegal to Cameroon, Mali, Zaire, Rwanda, Burundi, Sudan Ethiopia, Malawi, Zambia,	Trailing herb	Tall grassland with scattered trees, forest margins, swampy areas and streamside forest

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
			Zimbabwe, Mozambique, South Africa and Namibia also Yemen		

\*Range and habitat data apply to variety or subspecies only.

### 2.2.3 Mammals

Ten species of mammal from nine families were recorded.

**Table 8.** Checklist of the mammals of Kasanga.

Species	Common name	Most recent record
<b>COLOBIDAE</b>		
<i>Colobus angolensis</i>	Angola pied colobus	UMBCP 2000
<b>CERCOPITHECIDAE</b>		
<i>Papio cynocephalus</i>	Yellow baboon	UMBCP 2000
<b>GALAGONIDAE</b>		
<i>Galagoides</i> sp.	Galago	UMBCP 2000
<b>SORICIDAE</b>		
<i>Crocidura</i> sp. (2 species)	White-toothed shrew	UMBCP 2000
<b>RHYNCHONCYONINAE</b>		
<i>Rhynchocyon petersi</i>	Zanj elephant shrew	UMBCP 2000
<b>SCIURIDAE</b>		
<i>Paraxerus ochraceus</i>	Ochre bush squirrel	UMBCP 2000
<b>CRICETOMYINAE</b>		
<i>Beamys hindei</i>	Lesser pouched rat	UMBCP 2000
<b>MURIDAE</b>		
<i>Mastomys natalensis</i>	Multimammate rat	UMBCP 2000
<i>Mus</i> sp.	Common mouse	UMBCP 2000
<b>NANDININAE</b>		
<i>Nandinia binotata</i>	African palm civet	UMBCP 2000

<sup>1</sup> Three small galagos were observed briefly on a nocturnal transect walk however no advertising calls were heard and so it was not possible to determine clearly whether they were *G. orinus* or *G. zanzibaricus*. Given their quiet behaviour it is more likely that they were *G. orinus* but this is not certain.

### 2.2.4 Birds

Seventeen species of bird from 14 families were recorded.

**Table 9.** Checklist of the birds of Kasanga.

Species	Common name	Most recent record
<b>COLUMBIDAE</b>		
<i>Turtur tympanistria</i>	Tambourine dove	UMBCP 2000
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's turaco	UMBCP 2000
<b>TROGONIDAE</b>		
<i>Apaloderma vittatum</i>	Bar-tailed trogon	UMBCP 2000
<b>BUCEROTIDAE</b>		
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	UMBCP 2000
<b>PICIDAE</b>		
<i>Dendropicos fuscescens</i>	Cardinal woodpecker	UMBCP 2000
<b>PYCNONOTIDAE</b>		
<i>Andropadus masukuensis</i>	Shelley's greenbul	UMBCP 2000
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	UMBCP 2000

Species	Common name	Most recent record
<b>TURDIDAE</b>		
<i>Pogonocichla stellata</i>	White-starred robin	UMBCP 2000
<i>Turdus olivaceus</i>	Olive thrush	UMBCP 2000
<b>ZOSTEROPIDAE</b>		
<i>Zosterops senegalensis</i>	Yellow white-eye	UMBCP 2000
<b>MONARCHIDAE</b>		
<i>Terpsiphone viridis</i>	Paradise flycatcher	UMBCP 2000
<b>PLATYSTEIRIDAE</b>		
<i>Batis mixta</i>	Forest batis	UMBCP 2000
<i>Platysteira peltata</i>	Black-throated wattle-eye	UMBCP 2000
<b>DICRURIDAE</b>		
<i>Dicrurus adsimilis</i>	Common drongo	UMBCP 2000
<b>NECTARINIIDAE</b>		
<i>Nectarinia olivacea</i>	Olive sunbird	UMBCP 2000
<b>PLOCEIDAE</b>		
<i>Ploceus bicolor</i>	Dark-backed weaver	UMBCP 2000
<b>ESTRILDIDAE</b>		
<i>Lonchura cucullata</i>	Bronze mannikin	UMBCP 2000

### 2.2.5 Reptiles

Five reptile species from three families were recorded.

**Table 10.** Checklist of the reptiles of Kasanga.

Species	Common name	Most recent record
<b>GEKKONIDAE</b>		
<i>Hemidactylus platycephalus</i>	Baobab gecko	UMBCP 2000
<b>SCINCIDAE</b>		
<i>Mabuya maculilabris</i>	Speckle-lipped skink	UMBCP 2000
<i>Panaspis wahlbergii</i>	Savanna snake-eyed skink	UMBCP 2000
<b>COLUBRIDAE</b>		
<i>Philothamnus hoplogaster</i>	Southeastern green-snake	UMBCP 2000
<i>Crotaphopeltis tornieri</i>	Tornier's cat snake	UMBCP 2000

### 2.2.6 Amphibians

Nine species of amphibian from six families were recorded.

**Table 11.** Checklist of the amphibians of Kasanga

Species	Common name	Most recent record
<b>ARTHROLEPTIDAE</b>		
<i>Arthroleptis xenodactyloides</i>		UMBCP 2000
<i>Arthroleptis stenodactylus</i>		UMBCP 2000
<b>BUFONIDAE</b>		
<i>Bufo brauni</i>		UMBCP 2000
<i>Bufo gutturalis</i>		UMBCP 2000
<b>HYPEROLIDAE</b>		
<i>Hyperolius ?sp. nov.</i>		UMBCP 2000
<b>RHACOPHORIDAE</b>		
<i>Chiromantis xerampelina</i>		UMBCP 2000
<b>MICROHYLIDAE</b>		
<i>Probreviceps macrodactylus</i>		UMBCP 2000
<b>RANIDAE</b>		
<i>Arthroleptides martiensseni</i>		UMBCP 2000
<i>Rana angolensis</i>	Common river frog	UMBCP 2000

### 2.2.7 Biodiversity

Kasanga is important in being one of the few places in the Uluguru Mountains with natural forest between 700 m and 900 m asl. It is the only place in the Uluguru Mountains where the rodent *Beamys hindei* has been recorded.

One of the frogs collected appears to be a new species of *Hyperolius*. Further analysis is required before this can be confirmed.

### 2.2.8 Catchment value

The reserve protects the Mkwega and Bustani streams that flow into the Msuluzi. The reserve is a source of water for the irrigation channels around Kasanga Village.

### 2.2.9 Human impacts

Under the German administration there was a forest post in the south of the reserve. The forest here was cleared and replaced with mango trees. The German houses are still visible beneath a tangle of vegetation. After Independence the forest officer managed a small nursery in the south-east of the reserve. This was closed in 1983 when the forest officer was relocated to Mvuha.

The land immediately above the Msuluzi River has been cleared and is subject to frequent burning. The village has been planting the exotic *Senna siamea* in this area. Along the western border 10 ha of the exotic *Cedrela odorata* has been planted.

Four active or recently abandoned pitsaw sites were observed during the survey. The density of pitsawing is high given the size of the reserve. Bird traps were observed above the Bustani stream. A frequently used path leading to Mvuha passes through the forest. Amongst other things this is used to bring bush meat from around the Selous.

### 2.2.10 Management proposals

Action is needed to reduce the intensity of pitsawing, which is the key threat to the forest at present. Burning between the forest edge and the Msuluzi River should be halted and this area should be monitored carefully for encroachment by agriculture. Tree planting undertaken by the village should be supported. The reserve borders should be marked. Closer cooperation is needed between the District Forest Office and the local community to manage the reserve. This is particularly important as the remote location of the reserve is making it difficult for the forest officer to visit as he is stationed 14 km away, in Mvuha and lacks any form of transport.

### 2.3 *Kimboza Catchment Forest Reserve*

Morogoro District, Morogoro Region

Morogoro Division

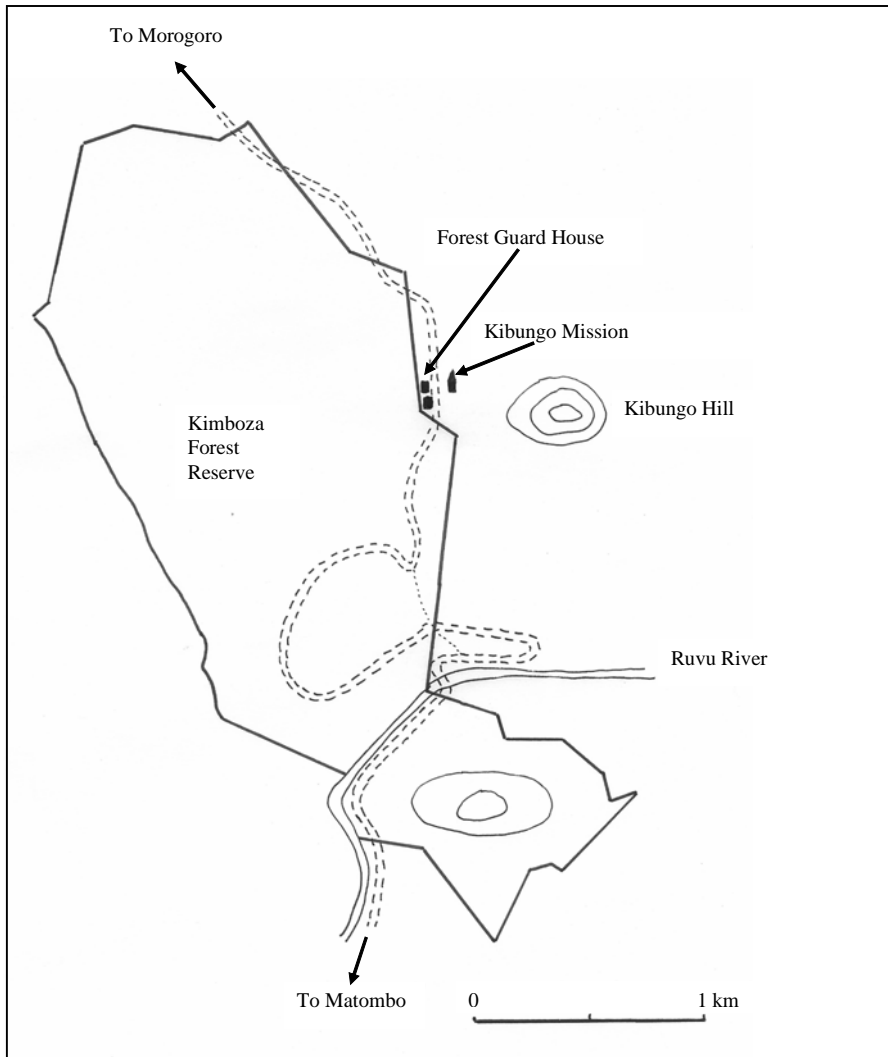
Year of establishment	:	1964
Declaration	:	GN 417 of 11/7/64
Variation order	:	None
Border map	:	Jb 2073 (1:10 000) 1982
Topographical maps	:	183/4, 201/2
Gazetted area	:	405 ha
Gazetted boundary length	:	11 km

#### 2.3.1 Location

06°59' - 07° 02' S 037° 47' - 037° 49' E

Access is from the Morogoro to Kisaki road between Mkuyuni and Matombo villages. The reserve is in the eastern Uluguru foothills covering a karstic plateau south of Kibungo Mission at an altitude of 300 to 400 m.

**Figure 3.** Sketch map for Kimboza Forest Reserve





### 2.3.2 Vegetation

The predominant natural vegetation type is seasonal lowland forest formerly with a 30-40 m high canopy of tall emergents, most of which have now been extracted. Within the forest protruding metamorphosed limestone karsts are a prominent feature.

Lowland forest: Large trees include: *Antiaris toxicaria*, *Aningeria pseudoracemosa*, *Bombax rhodognaphalon*, *Cordyla africana*, *Elaeis guineensis* (native, up to 20 m tall), *Khaya anthotheca* (formerly *K. nyasica*) (almost all exploited), *Isoberlinia scheffleri*, *Lettowianthus stellatus*, *Milicia excelsa*, *Newtonia paucijuga*, *Parkia filicoidea*, *Ricinodendron heudelotii* and *Sterculia appendiculata*. In the canopy large nest epiphytes, such as *Platyserium elephantotis* and *Davallia chaerophylloides*, are common. A second or third storey is formed by many smaller trees, such as *Cola stelenacantha* and *C. greenwayii*, *Cussonia zimmermannii*, *Dialium holtzii*, *Drypetes parviflora*, *Filicium decipiens*, *Garcinia livingstonei* and *G. semseii*, *Grandidiera boivinii*, *Ixora tanzaniensis*, *Leptonychia usambarensis*, *Scorodophloeus fischeri*, *Uvariadendron gorgonis* and *Zenkerella egregia*. Near springs and streamlets *Pandanus* cf. *englerii* forms large stands. The herb layer is often dominated by *Nephrolepis biserrata* and rare aroids occur such as *Amorphophallus stuhlmannii*, *Anchomanes difformis*, *Calloopsis volkensii* and *Gonatopus boivinii*. On shady limestone or marble rocks an interesting plant community contains *Zamioculcas zamiifolia* and the endemic *Impatiens cinnabarina*. At the northern edge of the reserve dry, semi-deciduous forests also occur. Along the road exotic *Cedrela* sp. and teak plantation forests occur.

No botanical collections were made in Kimboza during the UMBCP survey however details of collections made during 1983 by a team from the Tanzania Forest Working Group (now the Tanzania Forest Conservation Group) have been published (Rodgers et al. 1983).

### 2.3.3 Mammals

Sixteen species of mammal from 11 families were recorded by Rodgers et al. (1983), Perkin (pers. comm.) and Frontier-Tanzania (UDSM Biodiversity Database).

**Table 12.** Checklist of the mammals of Kimboza.

Species	Common name	Most recent record
COLOBIDAE		
<i>Colobus angolensis</i>	Angola pied colobus	UMBCP 2000
CERCOPITHECIDAE		
<i>Cercopithecus aethiops</i>	Savannah monkey	UMBCP 2000
GALAGONIDAE		
<i>Otolemur garnettii</i>	Small-eared galago	Perkin 2000
<i>Galagoides zanzibaricus</i>	Zanzibar galago	Perkin 2000
PTEROPODIDAE		
<i>Epomophorus wahlbergi</i>	Epauletted fruit bat	Frontier-Tanzania 1994
RHINOLOPHINAE		
<i>Rhinolophus hildebrandti</i>	Horseshoe bat	Frontier-Tanzania 1994
VESPERTILIONIDAE		
<i>Pipistrellus nanus</i>	Pipistrelle	Frontier-Tanzania 1994
<i>Scotophilus</i> sp.	House bat	Frontier-Tanzania 1994
SORICIDAE		

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Crocidura</i> sp.	White-toothed shrew	Frontier-Tanzania 1994
<b>MURIDAE</b>		
<i>Acomys spinosissimus</i>	Spiny mouse	Frontier-Tanzania 1994
<i>Praomys ?jacksoni</i>	Soft-furred mouse	Frontier-Tanzania 1994
<i>Grammomys macmillani</i>	Narrow-footed woodland mouse	Frontier-Tanzania 1994
<b>PROCAVIDAE</b>		
<i>Dendrohyrax</i> sp.	Tree hyrax	Rodgers et al. 1983
<b>SUIDAE</b>		
<i>Potamochoerus larvatus</i>	Bush pig	Rodgers et al. 1983
<b>BOVIDAE</b>		
<i>Cephalophus monticola</i>	Blue duiker	Rodgers et al. 1983
<i>Cephalophus harveyi</i>	Harvey's duiker	Rodgers et al. 1983

### 2.3.4 Birds

82 species of bird from 34 families were recorded by Rodgers et al. (1983) and Svendsen and Hansen (1995).

**Table 13.** Checklist of the birds of Kimboza

<b>Species</b>	<b>Common name</b>	<b>Range</b>	<b>Habitat</b>	<b>Most recent record</b>
<b>ACCIPITRIDAE</b>				
<i>Circaetus fasciolatus</i>	Southern banded snake eagle	Widespread	F	Svendsen and Hansen 1995
<i>Polyboroides typus</i>	African harrier hawk	Widespread	F	Rodgers et al. 1983
<i>Accipiter tachiro</i>	African goshawk	Widespread	F	Rodgers et al. 1983
<i>Accipiter minullus</i>	Little sparrowhawk	Widespread	F	Rodgers et al. 1983
<i>Gypohierax angolensis</i>	Palm-nut vulture	Widespread	F	Rodgers et al. 1983
<i>Stephanoaetus coronatus</i>	African crowned eagle	Widespread	FF	Svendsen and Hansen 1995
<b>NUMIDIDAE</b>				
<i>Guttera pucherani</i>	Crested guineafowl	Widespread	FF	Svendsen and Hansen 1995
<b>COLUMBIDAE</b>				
<i>Turtur tympanistris</i>	Tambourine dove	Widespread	FF	Rodgers et al. 1983
<i>Columba delegorguei</i>	Eastern bronze-naped pigeon	Widespread	FF	Rodgers et al. 1983
<i>Aplopelia larvata</i>	Lemon dove	Widespread	FF	Rodgers et al. 1983
<b>PSITTACIDAE</b>				
<i>Poicephalus robustus</i>	Brown-necked parrot	Widespread	O	Rodgers et al. 1983
<b>MUSOPHAGIDAE</b>				
<i>Tauraco livingstonii</i>	Livingstone's turaco	Widespread	F	Rodgers et al. 1983
<b>CUCULIDAE</b>				
<i>Cercococcyx montanus</i>	Barred long-tailed cuckoo	Widespread	FF	Svendsen and Hansen 1995
<i>Cercococcyx klaas</i>	Klaas's cuckoo	Widespread	F	Rodgers et al. 1983
<i>Ceuthmochares aereus</i>	Yellowbill	Widespread	F	Rodgers et al. 1983
<b>STRIGIDAE</b>				
<i>Strix woodfordii</i>	African wood owl	Widespread	F	Svendsen and Hansen 1995
<i>Glaucidium capense</i>	African barred owlet	Widespread	O	Rodgers et al. 1983
<b>APODIDAE</b>				
<i>Cypsiurus parvus</i>	African palm swift	Widespread	O	Rodgers et al. 1983
<i>Telcanthura ussheri</i>	Mottled spinetail	Widespread	O	Rodgers et al. 1983
<i>Neafrapus boehmi</i>	Bohm's spinetail	Widespread	F	Rodgers et al. 1983
<b>TROGONIDAE</b>				
<i>Apaloderma narina</i>	Narina's trogon	Widespread	FF	Svendsen and Hansen 1995
<i>Apaloderma vittatum</i>	Bar-tailed trogon	Widespread	FF	Rodgers et al. 1983
<b>PHOENICULIDAE</b>				
<i>Phoeniculus purpureus</i>	Green wood-hoopoe	Widespread	O	Rodgers et al. 1983
<b>BUCEROTIDAE</b>				
<i>Tockus alboterminatus</i>	Crowned hornbill	Widespread	F	Svendsen and Hansen 1995

Species	Common name	Range	Habitat	Most recent record
<i>Bycanistes bucinator</i>	Trumpeter hornbill	Widespread	FF	Svendsen and Hansen 1995
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	Widespread	F	Svendsen and Hansen 1995
CAPITONIDAE				
<i>Stactolaema leucotis</i>	White-eared barbet	Widespread	F	Svendsen and Hansen 1995
<i>Pogoniulus simplex</i>	Eastern green tinkerbird	Widespread	FF	Rodgers et al. 1983
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	Widespread	F	Svendsen and Hansen 1995
INDICATORIDAE				
<i>Indicator variegatus</i>	Scaly-throated honeyguide	Widespread	O	Rodgers et al. 1983
PICIDAE				
<i>Campethera abingoni</i>	Golden-tailed woodpecker	Widespread	O	Rodgers et al. 1983
<i>Dendropicos fuscescens</i>	Cardinal woodpecker	Widespread	F	Rodgers et al. 1983
EURYLAIMIDAE				
<i>Smithornis capensis</i>	African broadbill	Widespread	FF	Rodgers et al. 1983
HIRUNDINIDAE				
<i>Psalidoprocne pristoptera</i>	Black saw-wing	Widespread	F	Rodgers et al. 1983
PYCNONOTIDAE				
<i>Andropadus virens</i>	Little greenbul	Widespread	FF	Svendsen and Hansen 1995
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	Widespread	F	Rodgers et al. 1983
<i>Phyllastrephus terrestris</i>	Terrestrial brownbul	Widespread	F	Svendsen and Hansen 1995
<i>Phyllastrephus fischeri</i>	Fischer's greenbul	Eastern Arc and Coastal forests	FF	Rodgers et al. 1983
<i>Phyllastrephus flavostriatus</i>	Yellow-streaked greenbul	Widespread	FF	Svendsen and Hansen 1995
<i>Phyllastrephus debilis</i>	Tiny greenbul	Widespread	FF	Svendsen and Hansen 1995
<i>Chlorocichla flaviventris</i>	Yellow-bellied greenbul	Widespread	F	Rodgers et al. 1983
<i>Pycnonotus barbatus</i>	Common bulbul	Widespread	O	Rodgers et al. 1983
TIMALIIDAE				
<i>Illadopsis rufipennis</i>	Pale-breasted illadopsis	Widespread	F	Svendsen and Hansen 1995
TURDIDAE				
<i>Pogonocichla stellata</i>	White-starred robin	Widespread	FF	Rodgers et al. 1983
<i>Cossypha natalensis</i>	Red-capped robin-chat	Widespread	F	Svendsen and Hansen 1995
<i>Alethe fuelleborni</i>	White-chested alethe	Widespread	FF	Svendsen and Hansen 1995
<i>Neocossyphus rufus</i>	Red-tailed ant thrush	Widespread	FF	Svendsen and Hansen 1995
MUSCICAPIDAE				
<i>Muscicapa caerulescens</i>	Ashy flycatcher	Widespread	F	Rodgers et al. 1983
<i>Myioparus plumbeus</i>	Lead-coloured flycatcher	Widespread	O	Rodgers et al. 1983
SYLVIIDAE				
<i>Camaroptera brachyura</i>	Grey-backed camaroptera	Widespread	F	Svendsen and Hansen 1995
<i>Bradypterus lopezi</i>	Evergreen forest warbler	Widespread	FF	Rodgers et al. 1983
<i>Apalis melanocephala</i>	Black-headed apalis	Widespread	FF	Rodgers et al. 1983
<i>Macrosphenus kretschmeri</i>	Kretschmer's longbill	Widespread	FF	Svendsen and Hansen 1995
ZOSTEROPIDAE				
<i>Zosterops senegalensis</i>	Yellow white-eye	Widespread	FF	Rodgers et al. 1983
MONARCHIDAE				
<i>Erythrocerus holochlorus</i>	Little yellow flycatcher	Eastern Arc and Coastal forests	FF	Svendsen and Hansen 1995
<i>Trochocercus albonotatus</i>	White-tailed crested flycatcher	Widespread	FF	Rodgers et al. 1983
<i>Trochocercus cyanomelas</i>	Blue-mantled crested flycatcher	Widespread	F	Svendsen and Hansen 1995
<i>Terpsiphone viridis</i>	African paradise flycatcher	Widespread	F	Svendsen and Hansen 1995
PLATYSTEIRIDAE				
<i>Batis mixta</i>	Forest batis	Widespread	FF	Svendsen and Hansen 1995
<i>Bias musicus</i>	Black-and-white flycatcher	Widespread	F	Rodgers et al. 1983
PRIONOPIDAE				
<i>Prionops retzii</i>	Retz's helmet shrike	Widespread	F	Rodgers et al. 1983
<i>Prionops scopifrons</i>	Chestnut-fronted helmet shrike	Widespread	F	Rodgers et al. 1983

Species	Common name	Range	Habitat	Most recent record
<b>MALACONOTIDAE</b>				
<i>Malaconotus nigrifrons</i>	Black-fronted bush-shrike	Widespread	FF	Rodgers et al. 1983
<i>Malaconotus quadricolor</i>	Four-coloured bush-shrike	Widespread	F	Rodgers et al. 1983
<i>Laniarius aethiopicus</i>	Tropical boubou	Widespread	F	Rodgers et al. 1983
<i>Dryoscopus cubla</i>	Black-backed puffback	Widespread	F	Rodgers et al. 1983
<i>Nicator gularis</i>	Eastern nicator	Widespread	F	Svendsen and Hansen 1995
<b>CAMPEPHAGIDAE</b>				
<i>Campephaga quisqualina</i>	Purple-throated cuckoo-shrike	Widespread	F	Svendsen and Hansen 1995
<i>Campephaga flava</i>	Black cuckoo-shrike	Widespread	O	Rodgers et al. 1983
<i>Coracina caesia</i>	Grey cuckoo-shrike	Widespread	FF	Rodgers et al. 1983
<b>DICRURIDAE</b>				
<i>Dicrurus ludwigii</i>	Square-tailed drongo	Widespread	FF	Svendsen and Hansen 1995
<b>ORIOOLIDAE</b>				
<i>Oriolus chlorocephalus</i>	Green-headed oriole	Widespread	FF	Svendsen and Hansen 1995
<b>CORVIDAE</b>				
<i>Corvus albicollis</i>	White-naped raven	Widespread	F	Rodgers et al. 1983
<b>STURNIDAE</b>				
<i>Poeoptera kenricki</i>	Kenrick's starling	Widespread	FF	Rodgers et al. 1983
<i>Onychognathus morio</i>	Red-winged starling	Widespread	O	Rodgers et al. 1983
<b>NECTARINIIDAE</b>				
<i>Anthreptes neglectus</i>	Uluguru violet-backed sunbird	Widespread	FF	Svendsen and Hansen 1995
<i>Anthreptes collaris</i>	Collared sunbird	Widespread	F	Rodgers et al. 1983
<i>Nectarinia olivacea</i>	Olive sunbird	Widespread	F	Svendsen and Hansen 1995
<b>PLOCEIDAE</b>				
<i>Ploceus bicolor</i>	Dark-backed weaver	Widespread	F	Svendsen and Hansen 1995
<b>ESTRILDIDAE</b>				
<i>Mandingoa nitidula</i>	Green-backed twinspot	Widespread	FF	Svendsen and Hansen 1995
<i>Hypargos niveoguttatus</i>	Peter's twinspot	Widespread	FF	Rodgers et al. 1983
<i>Pyrenestes minor</i>	Lesser seed-cracker	Widespread	F	Svendsen and Hansen 1995

### 2.3.5 Reptiles

Ten species of reptile from seven families were recorded by Rodgers et al. (1983) and within the UDSM Biodiversity Database.

**Table 14.** Checklist of the reptiles of Kimboza.

Species	Common name	Most recent record
<b>GEKKONIDAE</b>		
<i>Lygodactylus williamsi</i>	Turquoise dwarf gecko	Rodgers et al. 1983
<i>Hemidactylus</i> sp.		
<b>AGAMIDAE</b>		
<i>Agama montana</i>	Montane rock agama	Rodgers et al. 1983
<b>CHAMAELEONIDAE</b>		
<i>Chamaeleo dilepis</i>	Common flap-necked chameleon	
<i>Rhampholeon brevicaudatus</i>	Bearded pigmy chameleon	
<b>LACERTIDAE</b>		
<i>Holaspis guentheri laevis</i>	Eastern serrate-toed tree-lizard	
<b>CORDYLIDAE</b>		
<i>Cordylus tropidosternum</i>	East African spiny-tailed lizard	
<b>ELAPIDAE</b>		
<i>Naja mossambica</i>	Mozambique spitting-cobra	
<i>Dendroaspis angusticeps</i>	Green mamba	
<b>COLUBRIDAE</b>		
<i>Natriciteres olivacea</i>	Olive marsh-snake	

### 2.3.6 Amphibians

Six species of amphibian from four families were recorded for Kimboza F.R. in the UDSM Biodiversity Database.

**Table 15.** Checklist of the amphibians of Kimboza.

Species	Common name
ARTHROLEPTIDAE	
<i>Arthroleptis stenodactylus</i>	Shovel-footed squeaker
BUFONIDAE	
<i>Nectophrynoides tornieri</i>	
HYPEROLIDAE	
<i>Afrixalus brachynemis</i>	Leaf-folding frog
<i>Leptopelis parkeri</i>	Tree frog
RANIDAE	
<i>Phrynobatrachus acridoides</i>	East African puddle frog
<i>Ptychadena anchietae</i>	Plain grass frog

### 2.3.7 Biodiversity

The forest is of the Eastern Arc and Coastal forest type, and so is rich in species of restricted distribution. For example the blue dwarf gecko (*Lygodactylus williamsi*) is endemic, found only on *Pandanus* sp. stems in Kimboza and Ruvu Forest Reserves. Compared to the small area a very high number of plant species are endemic: two *Asystasia* species, *Baphia pauloi*, *Chassalia discolor* var. *grandifolia*, *Cynometra uluguruensis* (a tall tree), *Garcinia bifasciculata* (tree), *Impatiens cinnabarina*, *Pavetta crebrifolia* var. *kimbozensis*, *Streptocarpus kimbozana*, and an epiphyllous liverwort: *Cololejeunea jonesii*.

### 2.3.8 Catchment values

There are several springs producing water all year and supplying several streamlets carrying water to the Ruvu River.

### 2.3.9 Human impacts

Logging has almost completely deprived the forest of its tall canopy trees. Most large *Khaya anthotheca* and *Milicia excelsa* trees were pitsawn in the early seventies. Large specimens of *Aningeria pseudoracemosa* existed in the late eighties but almost all have been logged. Minor forest products include building poles and medicines. *Cedrela* sp. from nearby plantations has invaded the forest, replacing the indigenous canopy trees.

### 2.3.10 Management proposals

Valuable timbers such as *Milicia excelsa* and *Khaya anthotheca* should be regenerated, and invasive *Cedrela* sp. controlled. Woodlots for building poles and firewood should be planted near villages to supply wood products currently supplied by the forest.

The reserve has a high biodiversity value with a high species diversity and many endemics. In addition, this type of lowland forest is rare in Tanzania. This suggests the reserve should be conserved and further exploitation prevented.

### 2.3.11 Literature

Lovett, J.C. & T. Pócs (1993). Assessment of the condition of the Catchment Forest

Reserves, a botanical appraisal. Catchment Forestry Report 93.3, Dar es Salaam. 300 pp.

Pócs, T. 1976. Vegetation mapping in the Uluguru Mountains (Tanzania, East Africa). *Boissiera* 24: 477-498 + 12 map.

Pócs, T. 1976. Bioclimatic studies in the Uluguru Mountains (Tanzania, East Africa). *Acta Bot. Acad. Sci. Hung.* 22: 163-183.

Rodgers, W.A., J.B. Hall, L.B. Mwasumbi, C.J. Griffiths and K. Vollesen 1983. The conservation values and status of Kimboza Forest Reserve, Tanzania. University of Dar es Salaam, mimeograph, 84 pp.

## 2.4 Konga Local Authority Forest Reserve

Morogoro District, Morogoro Region

Morogoro Division

Year of establishment	:	1910
Declaration	:	By Germans 1910
Variation order	:	140/29/3/1963 (Revocation order)
Border map	:	
Topographical maps	:	183/3
Gazetted area	:	503 ha
Gazetted boundary length	:	

### 2.4.1 Location

06° 55' S 37° 36' E

12 km south-west of Morogoro and adjacent to Konga Village. From the old Morogoro - Iringa road stop at Konga Village. The reserve is behind the village. The forest covers a level area at 540 m asl beside the Ngerengere Stream which forms the south-eastern border of the reserve.

The reserve is listed as having originally covered an area of 503 ha (Forestry and Beekeeping Division 2000). It was subsequently revoked in 1963 but was still featured on a map of the Local Authority reserves of Morogoro. The remaining forest covers an area of approximately 6 ha.

### 2.4.2 Vegetation

Dry lowland forest with a canopy at 20 m. The canopy is dominated by *Synsepalum msolo* and *Sterculia appendiculata*. Other common trees are *Sorindeia madagascariensis*, *Albizia gummifera* and *Diospyros mespiliformis*. *Milicia excelsa*, *Ficus exasperata*, *Bombax rhodolgnaphalon* and *Vangueria infausta* were also present. *Syzygia coffeoides* forms a closed low understorey at 1 - 3 m. The invasive alien *Lantana camara* is common close to the forest edges.

### 2.4.3 Mammals

Seven species of mammal from six families were recorded.

**Table 16.** Checklist of the mammals of Konga.

Species	Common name	Most recent record
CERCOPITHECIDAE		
<i>Cercopithecus aethiops</i>	Savannah monkey	UMBCP 2000
SCIURIDAE		
<i>Paraxerus flavovittis</i>	Striped bush squirrel	UMBCP 2000
HERPESTIDAE		
<i>Mungos mungo</i> <sup>1</sup>	Banded mongoose	UMBCP 2000
VIVERRIDAE		
<i>Civettictis civetta</i> <sup>1</sup>	African civet	UMBCP 2000
SUIDAE		
<i>Potamochoerus larvatus</i>	Bush pig	UMBCP 2000
BOVIDAE		
<i>Cephalophus monticola</i>	Blue duiker	UMBCP 2000
<i>Cephalophus harveyi</i> <sup>1</sup>	Harvey's duiker	UMBCP 2000

<sup>1</sup> These records are based on discussions with a local elder but were not observed by the recorder.

#### 2.4.4 Birds

Twenty-two species of bird from 18 families were recorded.

**Table 17.** Checklist of the birds of Konga.

Species	Common name	Most recent record
<b>ACCIPITRIDAE</b>		
<i>Accipiter tachiro</i>	African goshawk	UMBCP 2000
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's Turaco	UMBCP 2000
<b>CUCULIDAE</b>		
<i>Ceuthmochares aereus</i>	Yellowbill	UMBCP 2000
<b>STRIGIDAE</b>		
<i>Strix woodfordii</i>	African wood owl	UMBCP 2000
<b>TROGONIDAE</b>		
<i>Apaloderma narina</i>	Narina's trogon	UMBCP 2000
<b>BUCEROTIDAE</b>		
<i>Bycanistes bucinator</i>	Trumpeter hornbill	UMBCP 2000
<b>INDICATORIDAE</b>		
<i>Indicator variegatus</i>	Scaly-throated honeyguide	UMBCP 2000
<b>PICIDAE</b>		
<i>Dendropicos</i> sp.	Woodpecker	UMBCP 2000
<b>PYCNONOTIDAE</b>		
<i>Pycnonotus barbatus</i>	Common bulbul	UMBCP 2000
<b>TURDIDAE</b>		
<i>Pogonocichla stellata</i>	White-starred robin	UMBCP 2000
<i>Cossypha natalensis</i>	Red-capped robin-chat	UMBCP 2000
<i>Alethe fuelleborni</i>	White-chested alethe	UMBCP 2000
<b>SYLVIIDAE</b>		
<i>Apalis melanocephala</i>	Black-headed apalis	UMBCP 2000
<b>MONARCHIDAE</b>		
<i>Terpsiphone viridis</i>	Paradise flycatcher	UMBCP 2000
<i>Trochocercus albonotatus</i>	White-tailed crested flycatcher	UMBCP 2000
<b>MALACONOTIDAE</b>		
<i>Laniarius aethiopicus</i>	Tropical boubou	UMBCP 2000
<b>CAMPEPHAGIDAE</b>		
<i>Coracina caesia</i>	Grey cuckoo-shrike	UMBCP 2000
<b>DICRURIDAE</b>		
<i>Dicrurus adsimilis</i>	Common drongo	UMBCP 2000
<b>ORIORIDAE</b>		
<i>Oriolus chlorocephalus</i>	Green-headed oriole	UMBCP 2000
<b>NECTARINIIDAE</b>		
<i>Anthreptes collaris</i>	Collared sunbird	UMBCP 2000
<i>Nectarinia olivacea</i>	Olive sunbird	UMBCP 2000
<b>PLOCEIDAE</b>		
<i>Ploceus ocularis</i>	Spectacled weaver	UMBCP 2000

#### 2.4.5 Reptiles

Four species of reptile from four families were recorded.

**Table 18.** Checklist of the reptiles of Konga.

Species	Common name	Most recent record
<b>SCINCIDAE</b>		
<i>Mabuya</i> sp.		UMBCP 2000
<b>CORDYLIDAE</b>		
<i>Gerrhosaurus major major</i>	Southern tawny plated-lizard	UMBCP 2000



Species	Common name	Most recent record
VARANIDAE		
<i>Varanus niloticus</i>	Nile monitor	UMBCP 2000
ELAPIDAE		
<i>Dendroaspis angusticeps</i>	Green mamba	UMBCP 2000

#### 2.4.6 Amphibians

Two species of amphibian were recorded.

**Table 19.** Checklist of the amphibians of Konga.

Species	Most recent record
BUFONIDAE	
<i>Bufo gutturalis</i>	UMBCP 2000
RANIDAE	
<i>Ptychadena anchietae</i>	UMBCP 2000

#### 2.4.7 Biodiversity

The reserve is one of the few examples of lowland forest along the Ngerengere / Mkurunge valley. The vegetation and fauna are typical of lowland groundwater forest. The absence of the diurnal primates, *Cercopithecus mitis* and *Colobus angolensis* suggests that some species have been lost due to the small size of the forest.

#### 2.4.8 Catchment values

The forest is close to the Ngerengere stream.

#### 2.4.9 Human impacts

Konga is a residual patch of forest within an agricultural landscape. It is remarkable that it survives almost identically to aerial photographs taken in 1955. At the edge of the reserve, forest has been cleared recently from around the Ngerengere Stream. This appeared to be for cultivation although no crops were growing at the time of the survey. Firewood and poles are collected from the forest and there is almost no dead wood on the forest floor. There are graves in the west of the reserve. Duikers are being hunted.

#### 2.4.10 Management proposals

The village government are protecting the forest well however they need support to mark the borders and clear fire breaks. They would also benefit from assistance in planting trees as an alternative source of firewood and building materials.

## 2.5 *Mkangala Local Authority Forest Reserve*

Morogoro District, Morogoro Region

Morogoro Division

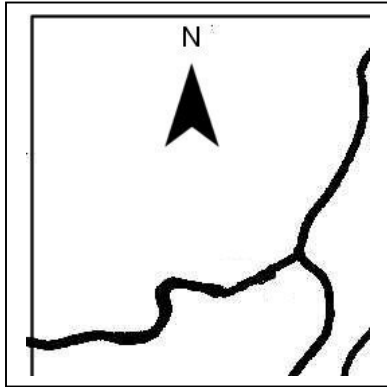
Year of establishment	:	1968
Declaration	:	377/18/10/1968
Variation order	:	
Border map	:	JB 472
Topographical maps	:	183/4
Gazetted area	:	7.0
Gazetted boundary length	:	

### 2.5.1 Location

06° 58'S 037° 44' E

Travelling south on the Morogoro - Kisaki road turn right just after Mkuyuni towards Changa. The reserve covers Mangala Hill between 280 m and 640 m asl. The Mvuha River forms the southern border. The upper slopes in the south of the reserve are very steep with a 50 m high rock face mid-slope. The northern part of the reserve is less steep.

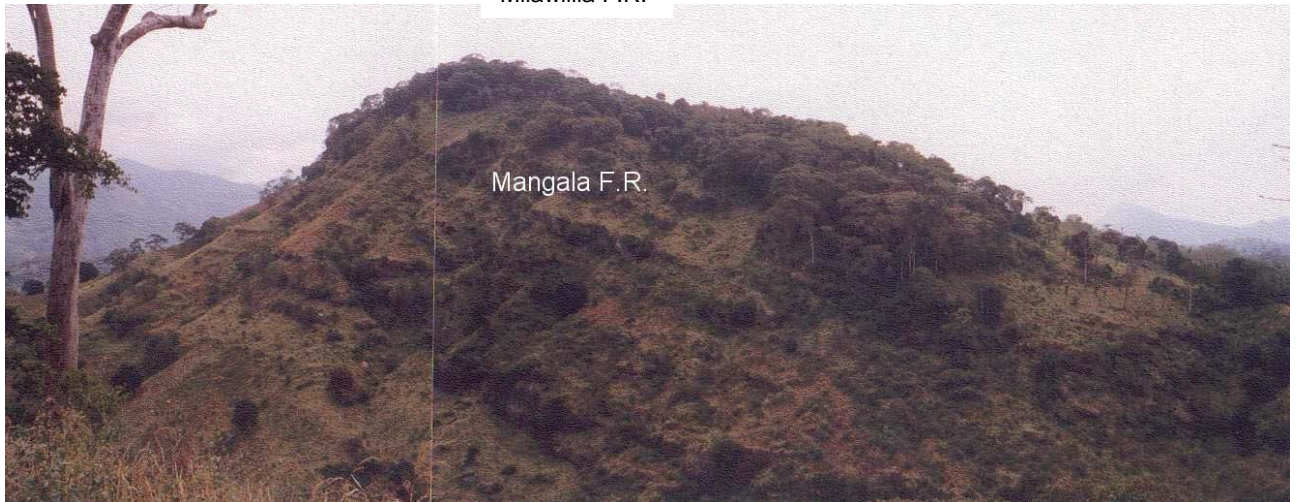
**Figure 4.** Sketch map of Mangala, Ngambaula and Milawilila Forest Reserves



### 2.5.2 Vegetation

Most of the reserve is dominated by bracken with a few trees, mainly *Brachystegia* sp. and *Julbernardia* sp. Lowland forest remains between 500 m - 620 m. In this area the canopy of the east-facing slope is dominated by *Tabernaemontana* sp. which is present in almost pure stands at higher altitudes. Lower down there is also *Bombax rhodognaphalon*, *Khaya anthotheca*, *Newtonia* sp. and *Sorindeia madagascariensis*. The canopy of the south-west facing slope is more diverse, dominated by *Terminalia brownii* with *Khaya anthotheca* and *Albizia gummifera* also common. In the shrub layer the climber *Acacia brevispica* is common.

**Figure 5.** Looking north towards the south side of Mangala F.R. A. Forest Reserve.



Of the 29 specimens collected in Mangala 25 have been identified to species level (Table 20). These include 23 species from 16 families.

Plant species or varieties recorded in Mangala F.R. with ranges restricted to FTEA regions T3, K7, T6, T8, Z and P (i.e. the FTEA regions that include the Eastern Arc and Coastal Forests) include *Gossypoides kirkii*, *Pavetta crebrifolia* var. *kimbozensis* and *Leptonychia usambarensis*.

**Table 20.** Annotated list of plant species collected in Mangala Forest Reserve.

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<b>ANACARDIACEAE</b>					
<i>Sorindeia madagascariensis</i>	Thouars ex DC.	1 - 1830	K4,7; T2,3,5-8; P;Z; Malawi, Mozambique, Mascarene Islands, Madagascar	Evergreen tree	Riverine, coastal and upland forest, often in wet or seasonally flooded places.
<b>ASTERACEAE</b>					
<i>Conyza attenuata</i>	DC.			Herb	
<i>Vernonia bruceae</i>	C. Jeffrey	1000 - 1200	T6,7 border; not known elsewhere.	Shrub, climber or small tree	Moist forest or forest margins
<b>COMBRETACEAE</b>					
<i>Combretum molle</i>	G. Don	30 - 2300	U1-4; K1-7; T1-8; throughout the wooded grassland areas or Tropical and southern Africa; also in the Yemen.	Small tree	Wooded grassland and bushland forming pure stands on hillsides.
<b>CONVULVULACEAE</b>					
<i>Xenostegia medium</i>	(L.) Austin & Staples			Trailing herb	
<b>CYPERACEAE</b>					
<i>Scleria lithosperma</i>	(L.) Sw.	80 - 500	K7; T3,6;		
<b>DIOSCOREACEAE</b>					
<i>Dioscorea sansibarensis</i>	Pax	0 - 900	U2; K7; T6-8; Z; P; Sudan, S. Africa, Mozambique, Madagascar	Shrub	
<i>Dioscorea dumetorum</i>	(Kunth) Pax	0 - 1650	U1-4; K7; T1,3,4,6-8; Z; Senegal, Ethiopia, Mozambique, Zimbabwe, S.Africa.	Shrub	
<b>EUPHORBIACEAE</b>					
<i>Alchornea laxiflora</i>	(Benth.) Pax & K. Hoffm.	10 - 1600	U1-4; K5,7; T1,4-6,8; from Nigeria eastwards to Ethiopia and south th South Africa.	Shrub or small tree	Evergreen forest, associated bushland in fire-protected places, also deciduous and riverine thickets near coast
<i>Sclerocroton integerrimus</i>	Hochst.				
<i>Tragiella natalensis</i>	(Sond.) Pax	80 - 2300	U1,3,4; K1-7; T1-3,6;	Herb	Forest edges,

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
	& K. Hoffm.		Sudan, Mozambique, Malawi, Zimbabwe, Zwaziland and South Africa		undergrowth, and associated bushland, riverine lakesides often in disturbed places.
FABACEAE					
<i>Dialium holtzii</i>	Harms	10 - 460	T3, 6-8; Mozambique	Tree	Lowland dry evergreen forest, riverine and swamp-forest, woodland; perhaps also in lowland forest.
<i>Macrotyloma axillare glabrum</i>	(E. Mey.) Verdc.	0 - 2520	U1-4; K3,4,6,8; T1-8; Z; P; Congo, ehtiofia, Arabia, Nigeria, Somali Republic, Mozambique, Zambia, Rhodesia, southAfrica, Madagascar, Mauritius and Sri Lanka.	Perennial herb	Grassland, bushland, open forest, seasonally flooded grassland, thicket.
LAURACEAE					
<i>Cinnamomum verum</i>	J. Presl	Introduced	Introduced from E. Asia	Small tree	
MALVACEAE					
<i>Hibiscus surattensis</i>	L.	1450	U1-4; K3,7; T1,3,4,6,8; Mozambique, Malawi, Zambia, Burundi, Zaire.	Herb	
RUBIACEAE					
<i>Aorantho penduliflora</i>	(K. Schum.) Somers	250 - 960	T3,6,8; not known elsewhere.	Shrub or small tree	Evergreen forest
<i>Pavetta stenosepala stenosepala</i>	K. Schum.	0 - 1300 (1800)	K7; T3,6; Z; not known elsewhere.	Shrub	Evergreen forest or thickets and bushland
<i>Rothmannia whitfieldii</i>	(Lindl.) Dandy	(700-) 1050 - 1675	U1,2,4; T7,8; throughout west tropical Africa, the Zaire basin, Sudan, Malawi, Zambia and Angola	Shrub or small tree	Forest
SAPOTACEAE					
<i>Synsepalum brevipes</i>	(Bak.) Pennington	0 - 1500	U2,4; K4,5,7; T1,3,4,6-8; Z; P; widespread in tropical Africa from Portuguese Gambia to the Sudan Republic and south to Angola, Zambia, Angola, Zambia, Malawi, Mozambique and Rhodesia	Small to medium tree	Lowland rain forest and riverine forest, commonly found on river banks and margins of lakes or other such sites with a high permanent water table.
TILIACEAE					
<i>Triumfetta cordifolia</i>	A. Rich.	1290	U2,3; T1,4; Zaire, Rwanda	Shrub	
URTICACEAE					
<i>Elatostema paivaeanum</i>	Wedd.	900 - 2100	T2,3,6,7; widespread in the wetter parts of tropical Africa, west to Guinee south to Malawi	Herb	Lowland rain forest or altitudinal transitional forest, in the moist ground cover, often along streams.
VIOLACEAE					
<i>Rinorea arborea</i>	(Thouars) Baill.	0 - 850	K7; T3,6,8; Z; Mozambique, Madagascar	Shrub or small tree	Lowland evergreen forest

<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
VITACEAE					
<i>Cyphostemma kirkianum</i>	(Planch.) Wild & Drummond	0 - 900	K7; T2,3,6; Z; P; Mozambique, Malawi, Zambia and Zimbabwe	Climbing herb	Rain-forest, lowland evergreen forest on coral, Casuarina woodland.

### 2.5.3 Mammals

Six mammal species from five families were recorded.

**Table 21.** Checklist of the mammals of Mangala.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>COLOBIDAE</b>		
<i>Colobus angolensis</i>	Angola pied colobus	UMBCP 2000
<b>CERCOPITHECIDAE</b>		
<i>Cercopithecus mitis</i>	Gentle monkey	UMBCP 2000
<b>GALAGONIDAE</b>		
<i>Otolemur garnettii</i>	Small-eared galago	UMBCP 2000
<i>Galagoides zanzibaricus</i>	Zanzibar galago	UMBCP 2000
<b>NANDININAE</b>		
<i>Nandinia binotata</i>	African palm civet	UMBCP 2000
<b>SUIDAE</b>		
<i>Potamochoerus larvatus</i>	Bush pig	UMBCP 2000

### 2.5.4 Birds

Fifty-four species of bird from 27 families were recorded.

**Table 22.** Checklist of the birds of Mangala.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>ACCIPITRIDAE</b>		
<i>Accipiter tachiro</i>	African goshawk	UMBCP 2000
<i>Gypohierax angolensis</i>	Palm-nut vulture	UMBCP 2000
<i>Stephanoaetus coronatus</i>	African crowned eagle	UMBCP 2000
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's turaco	UMBCP 2000
<b>STRIGIDAE</b>		
<i>Strix woodfordii</i>	African wood owl	UMBCP 2000
<b>APODIDAE</b>		
<i>Apus affinis</i>	Little swift	UMBCP 2000
<b>TROGONIDAE</b>		
<i>Apaloderma vittatum</i>	Bar-tailed trogon	UMBCP 2000
<b>ALCEDINIDAE</b>		
<i>Ispidina picta</i>	African pygmy kingfisher	UMBCP 2000
<b>BUCEROTIDAE</b>		
<i>Tockus alboterminatus</i>	Crowned hornbill	UMBCP 2000
<i>Bycanistes bucinator</i>	Trumpeter hornbill	UMBCP 2000
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	UMBCP 2000
<b>CAPITONIDAE</b>		
<i>Stactolaema leucotis</i>	White-eared barbet	UMBCP 2000
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	UMBCP 2000
<b>INDICATORIDAE</b>		
<i>Indicator variegatus</i>	Scaly-throated honeyguide	UMBCP 2000
<b>PICIDAE</b>		

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Dendropicos fuscescens</i>	Cardinal woodpecker	UMBCP 2000
<b>EURYLAIMIDAE</b>		
<i>Smithornis capensis</i>	African broadbill	UMBCP 2000
<b>HIRUNDINIDAE</b>		
<i>Hirundo senegalensis</i>	Mosque swallow	UMBCP 2000
<i>Psalidoprocne pristoptera</i>	Black saw-wing	UMBCP 2000
<b>PYCNONOTIDAE</b>		
<i>Andropadus virens</i>	Little greenbul	UMBCP 2000
<i>Andropadus masukuensis</i>	Shelley's greenbul	UMBCP 2000
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	UMBCP 2000
<i>Phyllastrephus fischeri</i>	Fischer's greenbul	UMBCP 2000
<i>Phyllastrephus flavostriatus</i>	Yellow-streaked greenbul	UMBCP 2000
<i>Pycnonotus barbatus</i>	Common bulbul	UMBCP 2000
<b>TIMALIIDAE</b>		
<i>Illadopsis rufipennis</i>	Pale-breasted illadopsis	UMBCP 2000
<b>TURDIDAE</b>		
<i>Pogonocichla stellata</i>	White-starred robin	UMBCP 2000
<i>Sheppardia</i> sp. nov.		UMBCP 2000
<i>Cossypha natalensis</i>	Red-capped robin-chat	UMBCP 2000
<i>Alethe fuelleborni</i>	White-chested alethe	UMBCP 2000
<i>Neocossyphus rufus</i>	Red-tailed ant thrush	UMBCP 2000
<i>Zoothera gurneyi</i>	Orange ground thrush	UMBCP 2000
<b>MUSCICAPIDAE</b>		
<i>Muscicapa caerulescens</i>	Ashy flycatcher	UMBCP 2000
<b>SYLVIIDAE</b>		
<i>Heliolais erythroptera</i>	Red-winged warbler	UMBCP 2000
<i>Camaroptera brachyura</i>	Grey-backed camaroptera	UMBCP 2000
<i>Melocichla mentalis</i>	African moustached warbler	UMBCP 2000
<i>Apalis flavida</i>	Yellow-breasted apalis	UMBCP 2000
<b>MONARCHIDAE</b>		
<i>Trochocercus albonotatus</i>	White-tailed crested flycatcher	UMBCP 2000
<i>Trochocercus cyanomelas</i>	Crested flycatcher	UMBCP 2000
<i>Terpsiphone viridis</i>	Paradise flycatcher	UMBCP 2000
<b>PLATYSTEIRIDAE</b>		
<i>Batis mixta</i>	Forest batis	UMBCP 2000
<b>PRIONOPIDAE</b>		
<i>Prionops scopifrons</i>	Chestnut-fronted helmet shrike	UMBCP 2000
<b>MALACONOTIDAE</b>		
<i>Malaconotus nigrifrons</i>	Black-fronted bush-shrike	UMBCP 2000
<i>Laniarius aethiopicus</i>	Tropical boubou	UMBCP 2000
<i>Dryoscopus cubla</i>	Black-backed puffback	UMBCP 2000
<b>CAMPEPHAGIDAE</b>		
<i>Coracina caesia</i>	Grey cuckoo-shrike	UMBCP 2000
<b>DICRURIDAE</b>		
<i>Dicrurus adsimilis</i>	Common drongo	UMBCP 2000
<i>Dicrurus ludwigii</i>	Square-tailed drongo	UMBCP 2000
<b>CORVIDAE</b>		
<i>Corvus albus</i>	Pied crow	UMBCP 2000
<b>NECTARINIIDAE</b>		
<i>Anthreptes neglectus</i>	Uluguru violet-backed sunbird	UMBCP 2000
<i>Anthreptes collaris</i>	Collared sunbird	UMBCP 2000
<i>Nectarinia olivacea</i>	Olive sunbird	UMBCP 2000
<b>PLOCEIDAE</b>		
<i>Ploceus bicolor</i>	Dark-backed weaver	UMBCP 2000
<b>ESTRILDIDAE</b>		

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Mandingoa nitidula</i>	Green-backed twinspace	UMBCP 2000
<i>Hypargos niveoguttatus</i>	Peter's twinspace	UMBCP 2000

### 8.5.5 Reptiles

Three species of reptile from three families were recorded.

**Table 23.** Checklist of the reptiles of Mangala.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
AGAMIDAE		
<i>Agama montana</i>	Montane rock agama	UMBCP 2000
CHAMAELEONIDAE		
<i>Rhampholeon brevicaudatus</i>	Bearded pigmy chameleon	UMBCP 2000
COLUBRIDAE		
<i>Aparallactus wernerii</i>	Usambara centipede-eater	UMBCP 2000

### 2.5.6 Amphibians

Three species of amphibian from two families were recorded.

**Table 24.** Checklist of the amphibians of Mangala.

Species	Common name	Most recent record
ARTHROLEPTIDAE		
<i>Arthroleptis xenodactyloides</i>		UMBCP 2000
<i>Arthroleptis stenodactylus</i>		UMBCP 2000
HYPEROLIDAE		
<i>Afrixalus brachycnemis</i>		UMBCP 2000

### 2.5.7 Biodiversity

Although much of the reserve is highly disturbed the forest on the steep southern slopes forms a diverse, closed canopy with many tree species typical of lowland Eastern Arc forest. The abundance of *Tabernaemontana* sp. appears to support a substantial population of *Cercopithecus mitis*. The fruits are also popular with the bush pig, which were common in the reserve. The forest supports a number of vertebrate species endemic to the Eastern Arc. This is also the first locality where the new species of akalat *Sheppardia* sp. nov. has been recorded in the vicinity of the Uluguru Mountains.

### 8.5.8 Catchment values

The reserve is adjacent to the Mvuha River however there is almost no forest on the banks of the river. A small spring was found close to the top of Mangala Hill, this had been dammed to provide water for the pitsaw camps. No other running water was seen.

### 2.5.9 Human impacts

Much of the reserve has been cleared, according to local people this has occurred quite recently. Rice cultivation extends into the northeast of the reserve where substantial areas of forest have been cleared. According to our guide the chairman of Ludewa has been proposing to clear the whole forest in order to plant coffee and has been issuing permits to cultivate within the Forest Reserve.

Active pitsaws were observed and most of the *Milicia excelsa* has already been extracted. *Albizia* sp. (not *gummifera*) is also being cut.

According to our guide there is commercial hunting for *Colobus angolensis*. The skins are sold to traders from Arusha.

### 2.5.10 Management proposals

Clearance of forest for rice and coffee cultivation is of serious concern. The District Forest Office needs to put an immediate halt to the forest clearance. This should be followed up by clarification with local communities about the protected status of the forest and more community involvement in managing the forest.

The boundaries need to be clearly marked and missing beacons should be replaced. Fire breaks need to be cleared. No map of the reserve was available from the Forestry and Beekeeping Division. If no copies can be retrieved then a new map should be prepared.



## 2.6 *Mlalivira (Milawilila) Local Authority Forest Reserve*

Morogoro District, Morogoro Region

Morogoro Division

Year of establishment	:	??
Declaration	:	Cap. 132 p. 1356
Variation order	:	
Border map	:	JB 1064
Topographical maps	:	183/4 and 183/3
Gazetted area	:	12.8 ha
Gazetted boundary length	:	

### 2.6.1 Location

06° 59' S 37°45' E

Travelling south on the Morogoro - Kisaki road turn right just after Mkuyuni towards Changa Village. The forest is 4 km walk from Changa. The reserve is on a gentle north-east slope between 320 m and 400 m asl. The Mvuha River forms the northern border of the reserve.

Although listed as Mlalivira on the gazette notice the reserve is also known as Milawilila.

See 2.5.1 for a sketch map showing the location of Milawilila Forest Reserve.



**Figure 6.** Looking west along the Mvuha towards Milwilila L.A. Reserve (outlined in white).

### 2.6.2 Vegetation

Lowland forest with a closed canopy at 15 m becoming more open towards the forest edge. The canopy is dominated by *Sorindeia madagascariensis*, *Tabernaemontana elegans*, *Albizia gummifera* and *Bombax rhodognaphalon*. Other canopy trees include

*Diospyros mespiliformis*, *Bridelia micrantha*, *Cussonia zimmermannii*, *Ficus exasperata*, *Deinbollia borbonica*, *Milicia excelsa* and *Sterculia appendiculata*. *Lamprosamnos* sp. is present in the understorey and *Piper capensis* is common in the shrub layer. Close to the river, *Dracaena montana* and *Afromomum* sp. are common. Close to the forest edge *Dalbergia metidula* and *Sclerya* sp. are common. There are *Brachystegia* sp. trees outside of the forest.

Of the 26 specimens collected in Milawilila 20 have been identified to species level (Table 25). These include 19 species from 15 families.

Plant species or varieties recorded in Milawilila F.R. with ranges restricted to FTEA regions T3, K7, T6, T8, Z and P (i.e. the FTEA regions that include the Eastern Arc and Coastal Forests) include *Warneckea amaniensis*, *Aorantho penduliflora* and *Pavetta crebrifolia* var. *kimbozensis*.

**Table 25.** Annotated list of plant species collected in Milawilila Forest Reserve.

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<b>ACANTHACEAE</b>					
<i>Brillantaisia stenolepis</i>	Sidwell	200 - 600		Shrub	
<i>Mellera lobulata</i>	S. Moore	600 - 1000	U2; T1,3,4,6; Ethiopia, Malawi	Shrub	
<b>APOCYNACEAE</b>					
<i>Carvalhoa campanulata</i>	K. Schum.	350	K7; T3,6,7; Malawi	Shrub	
<b>BALSAMINACEAE</b>					
<i>Impatiens walleriana</i>	Hook. f.	0-2000	K7; T2,3,6; Z, P; Mozambique, S. Malawi, E. Zimbabwe	Succulent perennial	In dam/ often shaded, places in upland and coastal rain-forest, particularly in riverine thickets, gullies and damp rocky places
<b>CUCURBITACEAE</b>					
<i>Zehneria scabra</i>	(L. f.) Sond.	80 - 3350	U1-4; K1-7; T1-8; Z; tropical Africa and South Africa, Arabia, peninsular India, Java, Philippines	Herb climbing or trailing	Rain and swamp or other ground water forest, riverine forest, grass thicket, seasonal swamp and damp places generally in bushland and woodland; also a weed of roadsides and plantations.
<b>CYPERACEAE</b>					
<i>Cyperus cyperoides</i>	(L.) O. Ktze.	150 - 2150	U3,4; K1-4,6,7; T1-8; Ethiopia, Zaire, Burundi, S.Africa, Somalia		
<b>DICHAPETALACEAE</b>					
<i>Dichapetalum madagascariense</i>	Poir.	0 - 2400	U2,4; K7; T1,2,6; Z; tropical Africa from Senegal to Angola and Mozambique, Comores, Madagascar	Liana	Rain forest, riverine forest and in associated bushland.
<b>ICACINACEAE</b>					
<i>Leptaulus holstii</i>	(Engl.) Engl.	700 - 1200	U4; T1,3-6, 8; Congo Republic and Angola	Shrub or small tree	Lowland rain forest.
<b>MALVACEAE</b>					

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<i>Wissadula rostrata</i>	(Schumacher & Thonn.) Hook. f.	700	U4; K2,5; T2-4,6-8; Burundi, Madagascar	Herb	
<b>MARANTACEAE</b>					
<i>Marantochloa leucantha</i>	(K. Schum.) Milne-Redh.	750 - 1200	U2,4; T1,3,6; Sierra Leone to Angola, Zaire and Sudan	Herb	Clearings and secondary growth in rain forest.
<b>MELASTOMATACEAE</b>					
<i>Warneckea amaniensis</i>	Gilg	40 - 600	K7; T3,6; not known elsewhere	Shrub or small tree	Lowland rain-forest and riverine forest
<b>MELIACEAE</b>					
<i>Trichilia emetica</i>	Vahl	10 - 1300	U1-3; K1, 3-7; T 1-8; Z	Tree	Coastal forest, drier types of riparian forest and riparian woodland; more rarely in rocky couptcoprs or in wooded grassland.
<b>MORACEAE</b>					
<i>Mesogyne isignis</i>	Engl.	500 - 1300	T3,6; S. Tome	Shrubs or trees.	Rain-forest;
<b>RUBIACEAE</b>					
<i>Aidia micrantha</i>	(K. Schum.) Bullock ex F. White	1140 - 1800	U2,4; T1,4,6,7; Zaire; Burundi, Malawi, Zambia, Mozambique and E. Zimbabwe.	Shrub or small tree	Evergreen forest and thicket including semi-swamp and riverine forest.
<i>Aorantho penduliflora</i>	(K. Schum.) Somers	250 - 960	T3,6,8; not known elsewhere.	Shrub or small tree	Evergreen forest
<i>Pauridiantha paucinervis holstii</i>	(Hiern) Bullock	500 - 2400	K3-5,7; T2-4,6,7; Zaire, Malawi and Zambia	Shrub or small tree	Lowland evergreen (including rain)forest, upland evergreen forest.
<i>Pavetta crebrifolia var. kimbozensis</i>	Hiern	400 - 460 (600)	T6; not known elsewhere.	Shrub or small tree	Forest on limestone
<b>TILIACEAE</b>					
<i>Grewia goetzeana</i>	K. Schum.			Tree	
<b>URTICACEAE</b>					
<i>Obetia radula</i>	(Bak.) B. D. Jackson	700 - 2000	U2-4; K1,3,4,3/6, 5,7; T1-3,6; E. Zaire, Rwanda, Rubundi, madagascar	Tree	Local on rocy hillsides in evergreen or semi-evergreen bushland (chiefly on hills of the basement complex, less commonly on basalt and lava), sometimes at rocky lake and river shores and at amrgines of dry montane forest.

### 2.6.3 Mammals

Due to the short survey time, only one species of mammal was recorded.

**Table 26.** Checklist of the mammals of Milawilila

Species	Common name	Most recent record
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COLOBIDAE		
<i>Colobus angolensis</i>	Angola pied colobus	UMBCP 2000

#### 2.6.4 Birds

Forty-nine species of bird were recorded from 27 families.

**Table 27.** Checklist of the birds of Milawilila

Species	Common name	Most recent record
<b>SCOPIDAE</b>		
<i>Scopus umbretta</i>	Hamerkop	UMBCP 2000
<b>THRESKIORNITHIDAE</b>		
<i>Bostrychia hagedash</i>	Hadada	UMBCP 2000
<b>ACCIPITRIDAE</b>		
<i>Accipiter tachiro</i>	African goshawk	UMBCP 2000
<i>Stephanoaetus coronatus</i>	African crowned eagle	UMBCP 2000
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's turaco	UMBCP 2000
<b>STRIGIDAE</b>		
<i>Strix woodfordii</i>	African wood owl	UMBCP 2000
<b>APODIDAE</b>		
<i>Cypsiurus parvus</i>	African palm swift	UMBCP 2000
<i>Apus affinis</i>	Little swift	UMBCP 2000
<b>TROGONIDAE</b>		
<i>Apaloderma narina</i>	Narina's trogon	UMBCP 2000
<i>Apaloderma vittatum</i>	Bar-tailed trogon	UMBCP 2000
<b>ALCEDINIDAE</b>		
<i>Ispidina picta</i>	African pygmy kingfisher	UMBCP 2000
<i>Megaceryle maxima</i>	Giant kingfisher	UMBCP 2000
<b>BUCEROTIDAE</b>		
<i>Tockus alboterminatus</i>	Crowned hornbill	UMBCP 2000
<i>Bycanistes bucinator</i>	Trumpeter hornbill	UMBCP 2000
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	
<b>CAPITONIDAE</b>		
<i>Pogoniulus simplex</i>	Eastern green tinkerbird	UMBCP 2000
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	UMBCP 2000
<b>PICIDAE</b>		
<i>Dendropicus fuscescens</i>	Cardinal woodpecker	UMBCP 2000
<b>EURYLAIMIDAE</b>		
<i>Smithornis capensis</i>	African broadbill	UMBCP 2000
<b>HIRUNDINIDAE</b>		
<i>Hirundo senegalensis</i>	Mosque swallow	UMBCP 2000
<i>Psalidoprocne pristopectera</i>	Black saw-wing	UMBCP 2000
<b>PYCNONOTIDAE</b>		
<i>Andropadus virens</i>	Little greenbul	UMBCP 2000
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	UMBCP 2000
<i>Phyllastrephus fischeri</i>	Fischer's greenbul	UMBCP 2000
<i>Phyllastrephus flavostriatus</i>	Yellow-streaked greenbul	UMBCP 2000
<i>Pycnonotus barbatus</i>	Common bulbul	UMBCP 2000
<b>TIMALIIDAE</b>		
<i>Illadopsis rufipennis</i>	Pale-breasted illadopsis	UMBCP 2000
<b>TURDIDAE</b>		
<i>Pogonocichla stellata</i>	White-starred robin	UMBCP 2000
<i>Sheppardia</i> sp. nov.		UMBCP 2000
<i>Cossypha natalensis</i>	Red-capped robin-chat	UMBCP 2000
<i>Alethe fuelleborni</i>	White-chested alethe	UMBCP 2000

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Zoothera gurneyi</i>	Orange ground thrush	UMBCP 2000
SYLVIIDAE		
<i>Heliolais erythroptera</i>	Red-winged warbler	UMBCP 2000
<i>Camaroptera brachyura</i>	Grey-backed camaroptera	UMBCP 2000
MONARCHIDAE		
<i>Trochocercus cyanomelas</i>	Crested flycatcher	UMBCP 2000
<i>Terpsiphone viridis</i>	Paradise flycatcher	UMBCP 2000
PLATYSTEIRIDAE		
<i>Batis mixta</i>	Forest batis	UMBCP 2000
PRIONOPIDAE		
<i>Prionops scopifrons</i>	Chestnut-fronted helmet shrike	UMBCP 2000
MALACONOTIDAE		
<i>Dryoscopus cubla</i>	Black-backed puffback	UMBCP 2000
DICRURIDAE		
<i>Dicrurus adsimilis</i>	Common drongo	UMBCP 2000
<i>Dicrurus ludwigii</i>	Square-tailed drongo	UMBCP 2000
ORIOOLIDAE		
<i>Oriolus larvatus</i>	Black-headed oriole	UMBCP 2000
STURNIDAE		
<i>Onychognathus walleri</i>	Waller's starling	UMBCP 2000
NECTARINIIDAE		
<i>Anthreptes collaris</i>	Collared sunbird	UMBCP 2000
<i>Nectarinia olivacea</i>	Olive sunbird	UMBCP 2000
PLOCEIDAE		
<i>Ploceus bicolor</i>	Dark-backed weaver	UMBCP 2000
ESTRILDIDAE		
<i>Mandingoa nitidula</i>	Green-backed twinspot	UMBCP 2000
<i>Hypargos niveoguttatus</i>	Peter's twinspot	UMBCP 2000

### 8.6.5 Reptiles

Two species of reptile from two families were recorded.

**Table 28.** Checklist of the reptiles of Milawilila

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
CHAMAELEONIDAE		
<i>Rhampholeon brevicaudatus</i>	Bearded pigmy chameleon	UMBCP 2000
SCINCIDAE		
<i>Mabuya varia</i>	Variable skink	UMBCP 2000

### 2.6.6 Amphibians

Four species of amphibian from four families were recorded.

**Table 29.** Checklist of the amphibians of Milawilila

<b>Species</b>	<b>Most recent record</b>
ARTHROLEPTIDAE	
<i>Arthroleptis xenodactyloides</i>	UMBCP 2000
HYPEROLIDAE	
<i>Leptopelis flavomaculatus</i>	UMBCP 2000
MICROHYLIDAE	
<i>Spelaophryne methneri</i>	UMBCP 2000
RANIDAE	
<i>Phrynobatrachus acridoides</i>	UMBCP 2000

#### 2.6.7 Biodiversity

The forest is a good example of lowland evergreen forest of which little remains in the Ulugurus. It has a rich avifauna including the new species of akalat *Sheppardia* sp. nov.. The frog *Spelaeophryne methneri* has only been recorded in the Ulugurus from Milawilila. It is endemic to Tanzania.

#### 2.6.8 Catchment values

The reserve protects the banks of the Mvuha River.

#### 2.6.9 Human impacts

Timber is being extracted from the reserve although at a lower rate than in the neighbouring Forest Reserves of Mangala and Ngambaula. A frequently used path runs through the middle of the reserve.

#### 2.6.10 Management proposals

The reserve border should be cleared and marked and the pitsawing should be controlled. Communities surrounding the reserve should be encouraged to participate in the management of the forest or additional resourced should be provided to the District Forest Officer so that more frequent visits can be made.

## 2.7 *Mkungwe Catchment Forest Reserve*

Morogoro District, Morogoro Region

Morogoro Division

Year of establishment

: 1954

Declaration

: GN 52 of 26/2/54

Variation order

: Variation initiated in 1982 (Jb 2078) for a larger area of 5645 ha, but not yet legally finalised (from Lovett)

Border map

: Jb 171, Jb 2078 (1:25 000)

Topographical maps

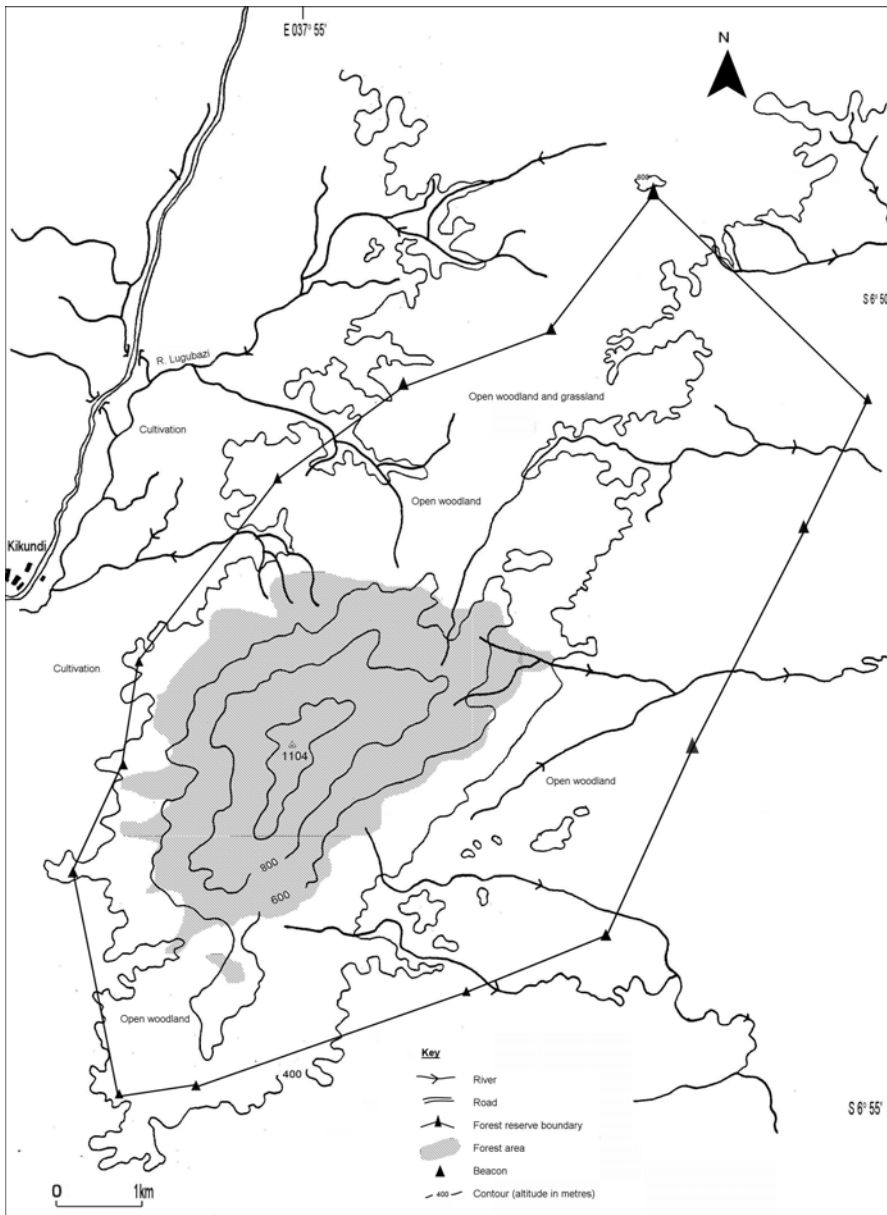
: 183/4

Gazetted area

: 1967 ha, 5645 ha on Jb 2078

Gazetted boundary length

: 30 km on Jb 2078



**Figure 7.** Sketch map of Mkungwe Forest Reserve.

### 2.7.1 Location

6° 51' - 6° 55' S 37° 53' - 37° 57' E

15 km from Mikese, 3 km east of Kikundi village. Access is from Mikese on the Mikese to Msumbisi road. The reserve covers an isolated hill at the northeast edge of the Uluguru Mountains from an altitude of 360 m to 1104 m.

### 8.7.2 Soils

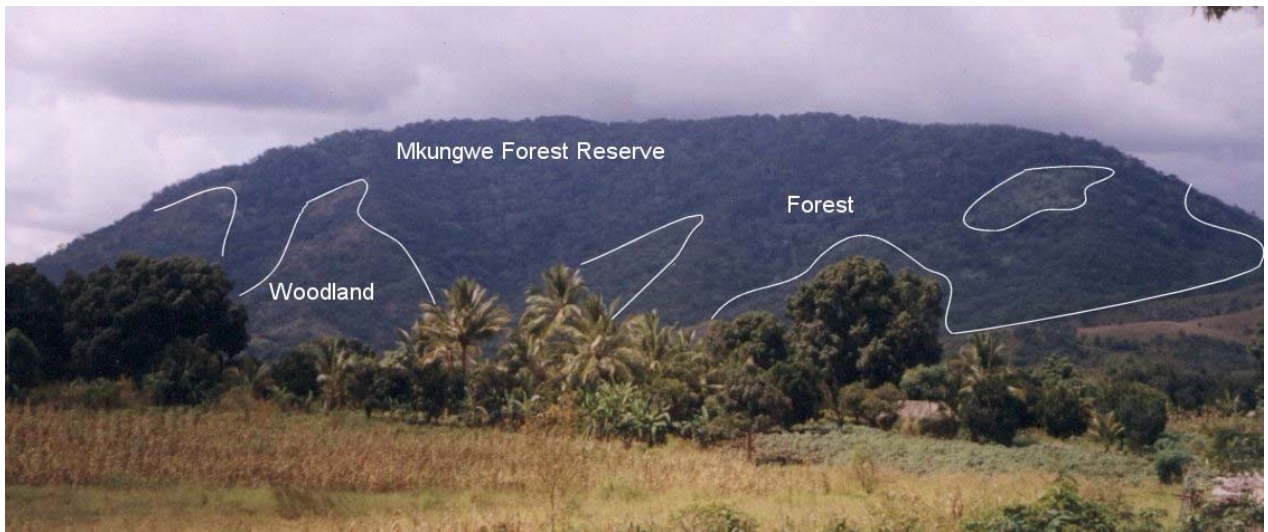
Ferralitic latosols developed on Precambrian gneiss and granulite rock.

### 8.7.3 Climate

Oceanic rainfall with oceanic temperatures. Nearest rainfall stations: Tegetero Mission. Estimated rainfall: 1700-2900 mm/year on the wetter eastern and upper slopes, mist effect on the summit. Dry season: not marked, on the eastern side, 2-3 months on the western side at lower altitudes. Temperatures: 24°C max (Dec.), 19°C min (July).

### 8.7.4 Vegetation

Submontane forest covers the largest part of the reserve, with transitions to lowland rainforest below 800 m. Dry forest occupies some lower side ridges on the western slope, where the soil is shallow. Woodland occupies the lower slopes below 700 (to 400) m altitude.



**Figure 8.** View of western side of Mkungwe from Kikundi Village with forest area outlined.

Submontane forest: Canopy tall with emergent trees up to 50 m, with: *Allanblackia stuhlmannii*, *Cephalosphaera usambarensis*, *Cylicomorpha parviflora*, *Isoberlinia scheffleri* and *Newtonia buchananii*. In the lower part of canopy *Allophylus pervillei*, *Drypetes natalensis* and *Polyceratocarpus scheffleri* occur. In the transition to lowland rainforest *Tetrapleura tetraptera* and *Zenkerella egregia* occur. In the ground layer *Aneilema aequinoctiale*, *Leptaspis cochleata*, *Nephrolepis biserrata* and *Pollii condensata* are typical.

Dry forest: Canopy to 10 m with *Bequaertiodendron natalense*, *Manilkara* sp.,



*Scorodophloeus fischeri*. Undergrowth with plants tolerant of dry conditions such as *Pellea doniana*, *P. adiantoides*, *Phymatodes scolopendrium* and *Davallia chaerophylloides*.

Woodland: Dominated by *Brachystegia boehmii*, *B. microphylla* and *Vitex doniana*.

**Figure 9.** Woodland and forest (outlined) in the south of Mkungwe



Of the 121 specimens collected in Mkungwe 97 have been identified to species level (Table 30). These include 80 species from 36 families.

Plant species or sub-species recorded in Mkungwe with ranges restricted to FTEA regions K7, T3,6 and 8, Z and P (i.e. the FTEA regions that include the Eastern Arc and Coastal Forests) include *Stendandrium afromontanum*, *Ophrypetalum odoratum subsp. longipedicellatum*, *Alsodeiopsis schumannii*, *Hibiscus faulknerae*, *Turraea kimbozensis*, *Adenia lindiensis*, *Coffea sessiliflora*, *Coffea sp. E of FTEA*, *Lasianthus cereiflorus*, *Pavetta holstii*, *Psychotria pandurata*, *Tricalysia pedicellata*, *Solanum zanzibarense* and *Cola stelechantha*.

**Table 30.** Annotated list of plant species collected in Mkungwe Forest Reserve.

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
ACANTHACEAE					
<i>Asystasia moorei</i>	Ensermu, ined.	800		Shrub	
<i>Asystasia sp. nov. aff. A. leptostachya</i>	Lindau (Polhill 4640, etc.)				
<i>Brachystephanus africanus</i>	S. Moore	300 - 1400	T1,6; U2; Malawi; Cameroon	Herb	
<i>Brillantaisia stenolepis</i>	Sidwell	200 - 600		Shrub	
<i>Dicliptera mossambicensis</i>	Klotzsch	350 - 1200	K7; T6; Malawi, Zambia, Zimbabwe and Mozambique	Climber	
<i>Isoglossa lactea</i>	Lindau ex Engl.	250 - 800 (-1700)	T2,3,6,7	Shrub	
<i>Justicia asystasioides</i>	(Lindau)	550 - 1250		Shrub	

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
	M.E.Steiner				
<i>Justicia engleriana</i>	Lindau				
<i>Justicia interrupta</i>	(Lindau) C. B. Clarke	400 - 700	T2,3,6	Shrub	
<i>Justicia nyassana</i>	Lindau	600	U2; K1,2,4,6,7; T2,3,4,6,7,8; Burundi, Central African Republic, Malawi, Zambia	Herb	
<i>Metarungia pubinervia</i>	(T. Anderson) Baden		T2,6; Zambia		
<i>Phaulopsis imbricata</i>	(Forssk.) Sweet	450 - 750	U2,4; K1,3,4,5,6,7; T1,2,3,4,6,7; Z; P; Malawi, Burundi, Cameroon, Gabon, Republic of Congo	Shrub	
<i>Pseuderanthemum hildebrandtii</i>	Lindau	1000 - 2500	K1,4,6,7; T2,3,6,8; Cameroon	Shrub	
<i>Stendandrium afromontanum</i>	(Mildbr.) Vollesen	950	T6	Herb	
<i>Thunbergia alata</i>	Bojer ex Sims	100 - 2000	U2-4; K1-7; T1-8; Z; pantropical	Creeping herb	
ADIANTHACEAE					
<i>Adiantum lunulatum</i>	Burm. F.				
AMARANTHACEAE					
<i>Celosia schweinfurthiana</i>	Schinz	3 - 1550	U2-4; K1,3, 5-7; T1-7; Sudan, Ethiopia, Zaire and Angola	Shrub	As ground cover along forest rides, margins and clearings especially near water or scrambling in thicker forest, otherwise in roadside or coastal bushland or as a weed of cultivation.
ANACARDIACEAE					
<i>Sorindeia madagascariensis</i>	Thouars ex DC.	1 - 1830	K4,7; T2,3,5-8; P;Z; Malawi, Mozambique, Mascarene Islands, Madagascar	Evergreen tree	Riverine, coastal and upland forest, often in wet or seasonally flooded places.
ANNONACEAE					
<i>Ophrypetalum odoratum</i> subsp. <i>longipedicellatum</i>	Verdc.	200 - 450	T6	Shrub	
ASCLEPIADACEAE					
<i>Pergularia daemia</i>	(Forssk.) Chiov.		U2,4; T1,2,3,6,7, Z; Malawi, W. Africa, Pakistan	Climber	
ASTERACEAE					
<i>Adenostemma viscosum</i>	J. R. & G. Forst.	0 - 850	T6; Madagascar	Herb	

<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
<i>Aspilia mossambicensis</i>	(Oliv.) H. Wild		U1,3,4; K1-7; T1-8;	Shrub	
<i>Crassocephalum crepidioides</i>	(Benth.) S. Moore		U1-4; K1,3-7; T1-8;	Herb	
<i>Crassocephalum sarcobasis</i>	(DC.) S. Moore		U3; K2-7; T1-8; Ethiopia, Burundi, Zambia, Madagascar	Herb	
<i>Solanecio mannii</i>	(Hook. f.) C. Jeffrey		U1-4; K1-7; T1-8; Cameroon	Shrub or tree	
<i>Vernonia holstii</i>	O. Hoffm.	900 - 2100	K3,4,6,7; T2-7; Cameroon, Congo, Rwanda, Zambia, Malawi, Mozambique, Zimbabwe	Woody herb or shrub	Margins of and clearings in dry evergreen forest, secondary bushland, maybe locally common
<b>BALSAMINACEAE</b>					
<i>Impatiens walleriana</i>	Hook. f.	0-2000	K7; T2,3,6; Z, P; Mozambique, S. Malawi, E. Zimbabwe	Succulent perennial	In damp often shaded, places in upland and coastal rain-forest, particularly in riverine thickets, gullies and damp rocky places
<b>CELASTRACEAE</b>					
<i>Maytenus undata</i>	(Thunb.) Blakelock	0 - 3150	U1-4; K1-7; T1-4,6,7; Z; W. Afr, Mad, Sud, Som, Yemen	Shrub	Forest, riverine forest, woodland, evergreen and coastal bushland
<b>COMMELINACEAE</b>					
<i>Pollia condensata</i>	C. B. Clarke			Herb	
<i>Stanfieldiella imperforata</i>	(C.B. Clarke) Brenan		U2,4; Ethiopia	x	
<b>CONVOLVULACEAE</b>					
<i>Hewittia malabarica</i>	(L.) Suresh			Climber	
<i>Ipomoea wightii</i>	(Wall.) Choisy	50 - 2400	U1-4; K1-6; T1-8; Z; Mozambique, Myassaland, Rhodesia, South Africa also in Madagascar and tropical Asia.	Herb	Open forest, scrub.
<i>Lepistemon owariense</i>	(P. Beauv.) Hall. f.	200 -1350	U1-4; K5,7; T2-4, 6, 8; Sudan Republic, Congo Republic, Mozambique and Nyassaland extending ot Portuguese Guinea and Angola	Twiner	Lowland rain-forest and riverine forest
<b>CUCURBITACEAE</b>					
<i>Coccinia grandiflora</i>	Cogn.	100 - 1900	K7; T3,6,8; ?Malawi	Climber	Lowland and upland rain-forest.
<b>EUPHORBIACEAE</b>					
<i>Acalypha racemosa</i>	Wall. ex	100 - 2000	U1-4; K1,3-7; T1-	Perennial herb or	Forest, open places,

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
	Baill.		3,5,6,7,8	sub-shrub.	edges and riverine, sometimes in rocky or disturbed places nearby.
<b>FABACEAE</b>					
<i>Crotalaria laburnifolia</i>	L.	0 - 1850	U1,3,4; K1-7; T1-8; Eastern Congo, Rwanda, Sudan Ethiopia and Somali Republic, Mozambique, Malawi, Zambia and Rhodesia, also Mascarene Isl, India Ceylon, and Malesia to N.E. Australia	Bushy herb	Deciduous woodland and bushland, grassland and secondary scrub, also persisting on roadsides and cultivated ground.
<i>Desmodium gangeticum</i>	(L.) DC.	0 - 2000	U1-4; K3,4,7; T2-4, 6-8; Z; throughout the old world tropics; said to be introduced in America.	Perennial herb	Deciduous woodland, wooded and open grassland, riverine forest and swampy places.
<i>Dolichos trilobus</i>	L.	0 - 450 (1200)	K5,7; T1-3, 5-7; Z; P; Ehtiopia, Mozambique, Rhodesia, Angola, South Africa also Arabia and India to Ceylon, China and Philippines	Perennial climbing herb	Grassland, bushland and forest
<b>GESNERIACEAE</b>					
<i>Streptocarpus glandulosissimus</i>	Engl.	2700	U2; K1,4,7; T2,3,6,7; Rwanda, Burundi	Herb	
<i>Streptocarpus sp.</i>	Lindl.				
<b>ICACINACEAE</b>					
<i>Alsodeiopsis schumannii</i>	(Engl.) Engl.	900 - 2000	T3,6,7; not known elsewhere.	Tree or shrub	Lowland and upland rain-forests.
<b>LAMIACEAE</b>					
<i>Leucas densiflora</i>	Vatke		U2; K3-6; T2,3,5,6;	Shrub	
<i>Plectranthus laxiflorus</i>	Benth.				
<b>LILIACEAE</b>					
<i>Chlorophytum holstii</i>	A. Berger	580 - 1500	T5-7;	Perennial herb	Rocky outcrops
	Engl.			Herb	
<b>MALVACEAE</b>					
<i>Hibiscus faulknerae</i>	Vollesen		K7; T6,8;	Shrub or tree	
<b>MELASTOMATACEAE</b>					
<i>Calvoa orientalis</i>	Taub.	940 - 1800	U2,4; T1,3,6; Cameroun, Central African Republic and Zaire	Herb	Clearings and margins of rain forest
<i>Memecylon sp. aff. verruculosum Brenan, not matched.</i>	L.				
<b>MELIACEAE</b>					
<i>Turraea kimbozensis</i>	Cheek	300 - 450	T6; not known elsewhere.	Treelet	Lowland (groundwater) rain-forest on limestone;

<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
<b>MORACEAE</b>					
<i>Dorstenia hildebrandtii</i>	Engl.	0 - 2100	U2-4; K1-7; T1-7; Zaire, Rwanda, Burundi, Mozambique	Herb	Granitic, coral and limestone outcrops from open forest to woodland, bushland and succulent thickets, often near streams or in local water catchment areas, sometimes in shaded forest sites.
<i>Dorstenia kameruniana</i>	Engl.	0 - 1300	U2,4; K7; T3,6,7; extending to Angola and Cameroun, also in W. Africa.	Shrub or undershrub	Undergrowth of evergreen forests. Sometimes in secondary growth.
<i>Dorstenia schliebenii</i>	Mildbr.	300 - 2000	T 6-8; Malawi	Herb	Rain-forest, often among rocks.
<i>Ficus bussei</i>	Mildbr. & Burret	0 - 550	K7, T3, 5, 6, 8; Somalia, Mozambique, Malawi, Zambia, Zimbabwe.	Tree	Lowland forest, riverine, swamp forest and flood plains.
<b>PASSIFLORACEAE</b>					
<i>Adenia lindiensis</i>	Harms	0 - 1200	K7; T3,6,8; not known elsewhere	Climber	Shrub layer and edges of evergreen forest and associated bushland
<b>PIPERACEAE</b>					
<i>Peperomia blanda</i>	(Jacq.) Kunth	250 - 1800	U2,3; K4-7; T1-3, 6, 7, from Yemen to South Africa west to Zaire, Madagascar, Mascarene Isl, India, Burma to South America	Erect plant	Bare but often shady rocky places, evergreen scrub and 'dry' forest also margin of standing water and springs, often with Aloe and Aeschynomene or in riverine thickets, rarely an epiphyte
<i>Piper capense</i>	L. f.	650 - 2500	U2-4; K1,2,3-6,7; T1-4, 6-8; widespread in Africa from Sierra Leone to Cameroon, Rio Muni, Bioko, Sao Tome to Zaire, Twanda, Burundi, Sudan and Ethiopia south to Mozambique, Zimbabwe, Malawi Swaziland and South Africa.	Shrub or subshrub	Forest undergrowth in wet places, swampy forest edges, mixed bamboo-forest also upland scrub and thicket near streams, grassland and tree clumps.
<b>POACEAE</b>					
<i>Leptaspis zeylanica</i>	Nees ex Steud.			Herb	
<b>RUBIACEAE</b>					
<i>Bertiera letouzeyi</i> vel <i>sp. aff.</i>	N. Halle			Shrub	

<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
<i>Coffea sessiliflora</i>	Bridson	200	K7 and T6; not known elsewhere.	Shrub	Forested hillslopes
<i>Coffea sp. E of FTEA</i>	L.	500 - 600	T6; known only from one specimen.	Small tree	Dry evergreen forest
<i>Lasianthus cereiflorus</i>	E.A.Bruce	1000 - 1700	T6; not known elsewhere.	Shrub	Shrub layer of rain forest.
<i>Leptactina platyphylla</i>	(Hiern) Wernham	45 - 1650	U2,4; K5,7; T3,4,6,7,?8; Cameroun, Central African Republic, Zaire, Burundi, Rwanda, Sudan, Mozambique, Malawi	Shrub or small tree	Evergreen forest, woodland, secondary bushland.
<i>Oxyanthus speciosus stenocarpus</i>	DC.	750 - 2300	U1-3; K1, 3-7, T2,3,5-8; Rwanda, Ethiopia, Mozambique, Zimbabwe and South Africa	Shrub or small tree	Forest
<i>Pavetta aff. Sparsipila</i>	Bremek				
<i>Pavetta holstii</i>	Schumm.	600 - 2000	T3, 6; not known elsewhere.	Shrub, scrambling shrub or small tree	Evergreen forest.
<i>Pavetta stenosepala stenosepala</i>	K. Schum.	0 - 1300 (1800)	K7; T3,6; Z; not known elsewhere.	Shrub	Evergreen forest or thickets and bushland
<i>Psychotria pandurata</i>	Verdc.	300 - 1000	T3,6; not known elsewhere.	Herb	Rain forest
<i>Rothmannia ravae</i>	(Chiov.) Bridson	45 - 960	K7; T3,6,8; Somalia	Shrub or small tree	Thicket or sometimes forest
<i>Sericanthe odoratissima var. ulugurensis</i>	(K. Schum.) Robbr.	1100 - 1800	T6,7; Malawi	Shrub or small tree	Rain forest
<i>Tricalysia ovalifolia</i>	Hiern	0 - 1000	K7; T3,6,8; Z; Madagascar, Somalia, Aldabra, Assumption, Comores, Madagascar	Shrub or small tree	Coastal evergreen or mixed formations, secondary vegetation, dry thickets, wooded grassland and evergreen forest
<i>Tricalysia pedicellata</i>	Robbr.	300 - 700	T6; not known elsewhere.	Shrub or small tree	Forest
<b>RUTACEAE</b>					
<i>Vepris morogorensis</i>	(Kokwaro) Mziray			Shrub	
<b>SAPINDACEAE</b>					
<i>Allophylus pervillei</i>	Blume	0 - 550	K7; T3,6; Z; P; Madagascar, Comoro Is. and Seychelles	Shrub	Fringing forest, forest clumps, ground water forest, coastal Brachystegia and coral and other limestone, cliff tops.
<b>SAPOTACEAE</b>					
<i>Omphalocarpum</i>	Y.B. Harv. &			Tree	

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<i>strombocarpum</i>	Lovett				
SIMAROUBACEAE					
<i>Brucea tenuifolia</i>	Engl.	650 - 1350	U4; T3,6; not known elsewhere.	Shrub	Rain-forest
SOLANACEAE					
<i>Solanum zanzibarense</i>	Vatke	100 - 750	K7; T6,8; Z;	Shrub	
STERCULIACEAE					
<i>Cola stelechantha</i>	Brenan	500 - 1500	K7; T6	Tree	
<i>Leptonychia usambarensis</i>	K. Schum.			Tree or shrub	
URTICACEAE					
<i>Laportea lanceolata</i>	(Engl.) Chew	50 - 900	K7; T3,6; ? E. Zaire	Herb	Lowland rain forest, frequently sprawling over rocks in clearings or as forest edge, also on rocky in moist woodland.
<i>Pilea holstii</i>	Engl.	200 - 1400	K7; T3, 6; E. Zaire	Herb	In lowland rain forest
VIOLACEAE					
<i>Rinorea ilicifolia</i> var. <i>amplexicaulis</i>	Grey-Wilson	1150	T1,4,6 not known elsewhere.	Shrub or small tree	Evergreen forest
VITACEAE					
<i>Cyphostemma buchananii</i>	(Planch.) Wild & Drummond	0 - 1125	K7; T3-8;Z; Zaire, Malawi, Mozambique, Zambia, Zimbabwe, botswana and South Africa.	Herb	Coastal thicket on old coral reefs, etc, bushland, wooded grassland, woodland, forest also in old cultivations.
ZINGIBERACEAE					
<i>Costus subtriflorus</i>	K. Schum.	300 - 1070	T3,4;	Herb	

### 2.7.5 Catchment value

The reserve is part of the Ruvu river catchment. About nine streams carry water from the reserve, supplying Nyagule, Kikundi, Kibungo, Kidugalo and Lukangazi settlements, and Lusanga Estate with water. Around Kikundi many small scale rice fields are irrigated with the water.

### 2.7.6 Mammals

A total of 15 mammal species from nine families were recorded.

**Table 31.** Checklist of the mammals of Mkungwe.

Species	Common name	Most recent record
COLOBIDAE		
<i>Colobus angolensis</i>	Angola pied colobus	UMBCP 2000
CERCOPITHECIDAE		
<i>Papio cynocephalus</i>	Yellow baboon	UMBCP 2000
<i>Cercopithecus aethiops</i>	Savannah monkey	UMBCP 2000
<i>Cercopithecus mitis</i>	Gentle monkey	UMBCP 2000
GALAGONIDAE		

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Otolemur garnettii</i>	Small-eared galago	UMBCP 2000
<i>Galagoides zanzibaricus</i>	Zanzibar galago	UMBCP 2000
<i>Galagoides orinus</i>	Usambara galago	UMBCP 2000
<b>PTEROPODIDAE</b>		
<i>Lissonycteris angolensis</i>	Angolan fruit bat	UMBCP 2000
<i>Myonycteris relicta</i>	Collared fruit bat	UMBCP 2000
<b>SORICIDAE</b>		
<i>Crocidura</i> sp.	White-toothed shrew	UMBCP 2000
<b>NANDININAE</b>		
<i>Nandinia binotata</i>	African palm civet	UMBCP 2000
<b>PROCAVIDAE</b>		
<i>Dendrohyrax</i> sp.	Tree hyrax	UMBCP 2000
<b>SUIDAE</b>		
<i>Potamochoerus larvatus</i>	Bush pig	UMBCP 2000
<b>BOVIDAE</b>		
<i>Cephalophus monticola</i>	Blue duiker	UMBCP 2000
<i>Cephalophus harveyi</i>	Harvey's duiker	UMBCP 2000

### 2.7.7 Birds

Sixty-two species of bird from 29 families were recorded.

**Table 32.** Checklist of the birds of Mkungwe.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>ACCIPITRIDAE</b>		
<i>Polyboroides typus</i>	African harrier hawk	UMBCP 2000
<i>Accipiter tachiro</i>	African goshawk	UMBCP 2000
<i>Buteo oreophilus</i>	Mountain buzzard	UMBCP 2000
<i>Stephanoaetus coronatus</i>	African crowned eagle	UMBCP 2000
<b>COLUMBIDAE</b>		
<i>Turtur tympanistris</i>	Tambourine dove	UMBCP 2000
<i>Columba delegorguei</i>	Eastern bronze-naped pigeon	UMBCP 2000
<i>Aplopelia larvata</i>	Lemon dove	UMBCP 2000
<i>Streptopelia semitorquata</i>	Red-eyed dove	UMBCP 2000
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's Turaco	UMBCP 2000
<b>STRIGIDAE</b>		
<i>Strix woodfordii</i>	African wood owl	UMBCP 2000
<i>Bubo vosseleri</i>	Usambara eagle-owl	UMBCP 2000
<b>APODIDAE</b>		
<i>Apus affinis</i>	Little swift	UMBCP 2000
<b>TROGONIDAE</b>		
<i>Apaloderma narina</i>	Narina's trogon	UMBCP 2000
<i>Apaloderma vittatum</i>	Bar-tailed trogon	UMBCP 2000
<b>ALCEDINIDAE</b>		
<i>Ispidina picta</i>	African pygmy kingfisher	UMBCP 2000
<b>PHOENICULIDAE</b>		
<i>Phoeniculus purpureus</i>	Green wood-hoopoe	UMBCP 2000
<b>BUCEROTIDAE</b>		
<i>Tockus alboterminatus</i>	Crowned hornbill	UMBCP 2000
<i>Bycanistes bucinator</i>	Trumpeter hornbill	UMBCP 2000
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	UMBCP 2000
<b>CAPITONIDAE</b>		
<i>Stactolaema leucotis</i>	White-eared barbet	UMBCP 2000
<i>Stactolaema olivacea</i>	Green barbet	UMBCP 2000



<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Pogoniulus simplex</i>	Eastern green tinkerbird	UMBCP 2000
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	UMBCP 2000
<b>INDICATORIDAE</b>		
<i>Indicator variegatus</i>	Scaly-throated honeyguide	UMBCP 2000
<i>Indicator minor</i>	Lesser honeyguide	UMBCP 2000
<b>PICIDAE</b>		
<i>Dendropicos fuscescens</i>	Cardinal woodpecker	UMBCP 2000
<i>Dendropicos griseocephalus</i>	Olive woodpecker	UMBCP 2000
<b>EURYLAIMIDAE</b>		
<i>Smithornis capensis</i>	African broadbill	UMBCP 2000
<b>HIRUNDINIDAE</b>		
<i>Psalidoprocne pristoptera</i>	Black saw-wing	UMBCP 2000
<b>PYCNONOTIDAE</b>		
<i>Andropadus virens</i>	Little greenbul	UMBCP 2000
<i>Andropadus masukuensis</i>	Shelley's greenbul	UMBCP 2000
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	UMBCP 2000
<i>Phyllastrephus fischeri</i>	Fischer's greenbul	UMBCP 2000
<i>Phyllastrephus flavostriatus</i>	Yellow-streaked greenbul	UMBCP 2000
<i>Pycnonotus barbatus</i>	Common bulbul	UMBCP 2000
<b>TURDIDAE</b>		
<i>Pogonochila stellata</i>	White-starred robin	UMBCP 2000
<i>Cossypha natalensis</i>	Red-capped robin-chat	UMBCP 2000
<i>Alethe fuelleborni</i>	White-chested alethe	UMBCP 2000
<i>Neocossyphus rufus</i>	Red-tailed ant thrush	UMBCP 2000
<i>Zoothera gurneyi</i>	Orange ground thrush	UMBCP 2000
<i>Turdus olivaceus</i>	Olive thrush	UMBCP 2000
<b>SYLVIIDAE</b>		
<i>Heliolais erythroptera</i>	Red-winged warbler	UMBCP 2000
<i>Apalis flavida</i>	Yellow-breasted apalis	UMBCP 2000
<i>Apalis melanocephala</i>	Black-headed apalis	UMBCP 2000
<b>MONARCHIDAE</b>		
<i>Trochocercus cyanomelas</i>	Crested flycatcher	UMBCP 2000
<i>Terpsiphone viridis</i>	Paradise flycatcher	UMBCP 2000
<b>PLATYSTEIRIDAE</b>		
<i>Batis mixta</i>	Forest batis	UMBCP 2000
<b>PRIONOPIDAE</b>		
<i>Prionops retzii</i>	Retz's helmet shrike	UMBCP 2000
<b>MALACONOTIDAE</b>		
<i>Malaconotus nigrifrons</i>	Black-fronted bush-shrike	UMBCP 2000
<i>Dryoscopus cubla</i>	Black-backed puffback	UMBCP 2000
<b>CAMPEPHAGIDAE</b>		
<i>Coracina caesia</i>	Grey cuckoo-shrike	UMBCP 2000
<b>DICRURIDAE</b>		
<i>Dicrurus adsimilis</i>	Common drongo	UMBCP 2000
<i>Dicrurus ludwigii</i>	Square-tailed drongo	UMBCP 2000
<b>ORIOOLIDAE</b>		
<i>Oriolus larvatus</i>	Black-headed oriole	UMBCP 2000
<i>Oriolus chlorocephalus</i>	Green-headed oriole	UMBCP 2000
<b>CORVIDAE</b>		
<i>Corvus albicollis</i>	White-naped raven	UMBCP 2000
<b>STURNIDAE</b>		
<i>Onychognathus walleri</i>	Waller's starling	UMBCP 2000
<b>NECTARINIIDAE</b>		
<i>Anthreptes neglectus</i>	Uluguru violet-backed sunbird	UMBCP 2000
<i>Anthreptes collaris</i>	Collared sunbird	UMBCP 2000

Species	Common name	Most recent record
<i>Nectarinia olivacea</i>	Olive sunbird	UMBCP 2000
PLOCEIDAE		
<i>Ploceus bicolor</i>	Dark-backed weaver	UMBCP 2000
ESTRILDIDAE		
<i>Mandingoa nitidula</i>	Green-backed twinspot	UMBCP 2000
<i>Hypargos niveoguttatus</i>	Peter's twinspot	UMBCP 2000

### 2.7.8 Reptiles

Thirteen species of reptiles from six families were recorded.

**Table 33.** Checklist of the reptiles of Mkungwe.

Species	Common name	Most recent record
GEKKONIDAE		
<i>Lygodactylus luteopicturatus</i>		UMBCP 2000
<i>Urocotyledon wolterstorffii</i>		Mariaux 2000
<i>Cnemaspis africana</i>	Usambara forest gecko	UMBCP 2000
<i>Hemidactylus platycephalus</i>	Baobab gecko	UMBCP 2000
CHAMAELEONIDAE		
<i>Bradypodion oxyrhinum</i>	Uluguru one-horned chameleon	UMBCP 2000
<i>Chameleo deremensis</i>	Usambara three-horned chameleon	UMBCP 2000
<i>Rhampholeon brevicaudatus</i>	Bearded pigmy chameleon	UMBCP 2000
<i>Rhampholeon uluguruensis</i>	Uluguru pigmy chameleon	UMBCP 2000
SCINCIDAE		
<i>Melanoseps</i> sp.	Limbless skink	UMBCP 2000
<i>Mabuya maculilabris</i>	Speckle-lipped skink	UMBCP 2000
BOIDAE		
<i>Python sebae</i>	Southern African python	UMBCP 2000
VIPERIDAE		
<i>Bitis arietans</i>	Puff adder	UMBCP 2000
COLUBRIDAE		
<i>Buhome vauerocegae</i>	Usambara forest snake	UMBCP 2000
<i>Aparallactus wernerii</i>	Usambara centipede-eater	UMBCP 2000

### 2.7.9 Amphibians

Fifteen species of amphibian from six families have been recorded.

**Table 34.** Checklist of the amphibians of Mkungwe.

Species	Common name	Most recent record
ARTHROLEPTIDAE		
<i>Arthroleptis stenodactylus</i>	Shovel-footed squeaker	UMBCP 2000
<i>Arthroleptis affinis</i>		UMBPC 2000
<i>Arthroleptis xenodactyloides</i>		UMBCP 2000
<i>Arthroleptis xenodactylus</i>		UMBCP 2000
BUFONIDAE		
<i>Nectophrynoides</i> sp. nov.		UMBCP 2000
<i>Nectophrynoides minutus</i>		UMBCP 2000
<i>Nectophrynoides tornieri</i>		UMBCP 2000
HYPEROLIDAE		
<i>Leptopelis</i> sp.		UMBCP 2000
<i>Leptopelis flavomaculatus</i>		UMBCP 2000
<i>Leptopelis parkeri</i>		UMBCP 2000
MICROHYLIDAE		
<i>Callulina kreffti</i>		UMBCP 2000

Species	Common name	Most recent record
<i>Probreviceps macrodactylus</i>		UMBCP 2000
RANIDAE		
<i>Arthroleptides martiensseni</i>		UMBCP 2000
<i>Phrynobatrachus</i> sp. A.		UMBCP 2000
CAECILIDAE		
<i>Boulengerula uluguruensis</i>		UMBCP 2000

#### 8.7.10 Biodiversity

The forest is of the Eastern Arc type and is rich in species of restricted distribution. Examples of Eastern Arc endemics include the trees *Cephalosphaera usambarensis*, *Polyceratocarpus scheffleri*, and several Acanthaceae: *Hypoestes forskoolii*, *Justicia fittonioides*, and *Stenandriopsis warneckei*.

The fauna is equally rich in Eastern Arc endemics including the Uluguru endemic chameleon *Rhampholeon uluguruensis* and a new record for *Chamaeleo deremensis* previously thought to be restricted to the Usambara and Nguru Mountains. It is also the first forest in which *Galagoides orinus* and *Galagoides zanzibaricus* have been found living at the same altitude. The reserve provides habitat for seven species of primate.



#### 2.7.11 Human impacts

The forest is under intense pressure from pitsawing. Six active pitsaws were observed on the eastern side and seven on the west. Damage is most intense close to the forest edge on the western side of the reserve. Close to the ridge a semi-permanent camp had been established beside one of the larger pitsaw camps. Bushfires occur in the woodland every year and often damage the edge of the closed forest, which is therefore retreating.

Hunting is common and the size of the traps suggests that it is for bush pig as well as duiker, although surrounding villages are predominantly muslim.

**Figure 10.** Pitsaw site in the east of Mkungwe.

#### 2.7.12 Management proposals

The forest officer needs support in confronting the trade in timber from the reserve. Coordination is needed between the governments of the villages along the Mikesi to Msumbisi road to restrict the transport of timber from the reserve.

The boundaries have been cleared in some areas but still need to be planted and many of the beacons need to be replaced. Boundary plantations of building poles and fuelwood could supply some local needs. Exploited areas should be regenerated. The coordinates on the Forest Reserve map are incorrect and should be re-recorded.

### 2.7.13 Literature

Pócs, T. 1976. Bioclimatic studies in the Uluguru Mountains (Tanzania, East Africa) II. Correlations between orography, climate and vegetation. *Acta Bot. Acad. Sci. Hung.* 22: 163-183.

Lovett, J.C. & T. Pócs (1993). Assessment of the condition of the Catchment Forest Reserves, a botanical appraisal. *Catchment Forestry Report 93.3*, Dar es Salaam. 300 pp.

## 2.8 Mvuha and Chamanyani Catchment Forest Reserve

Morogoro District, Morogoro Region

Morogoro Division

Year of establishment	:	German administration
Declaration	:	Cap. 137/1958
Variation order	:	137/1355/1947
Border map	:	Jb 1077 (1:10 000) 1910
Topographical map	:	201/2
Gazetted area	:	1506 ha
Gazetted boundary length	:	No schedule, estimated to be 48 km

### 2.8.1 Location

07° 08' - 07° 13' S 37° 47' - 37° 51' E

30 km from Kimboza. Access is from the Kimboza to Mvuha road, which traverses Chamanyani FR near the eastern boundary, and by foot up the southern side of the Mvuha river to Mvuha FR. The reserve covers hilly country to the east of the Uluguru mountains and part of the Mvuha river valley from an altitude of 140 to 400 m.

### 2.8.2 Soils

Brown sandy soils over crystalline gneiss under the woodlands with more humus and occasionally flooded sandy loams in the Mvuha valley. Richly calcareous slopes are recorded from the eastern side of Bewa Hill.

### 2.8.3 Climate

Nearest rainfall stations: Bwikira juu, Mkuyuni. Estimated rainfall: 1400 mm/year. Dry season: June - Sep. Temperature range 28°C max (Dec.), 23°C min (July).

### 2.8.4 Vegetation

Most of the reserve is covered by woodland or wooded grassland, the more open areas of which appear to be maintained by fire. Valleys and valley heads are forested.

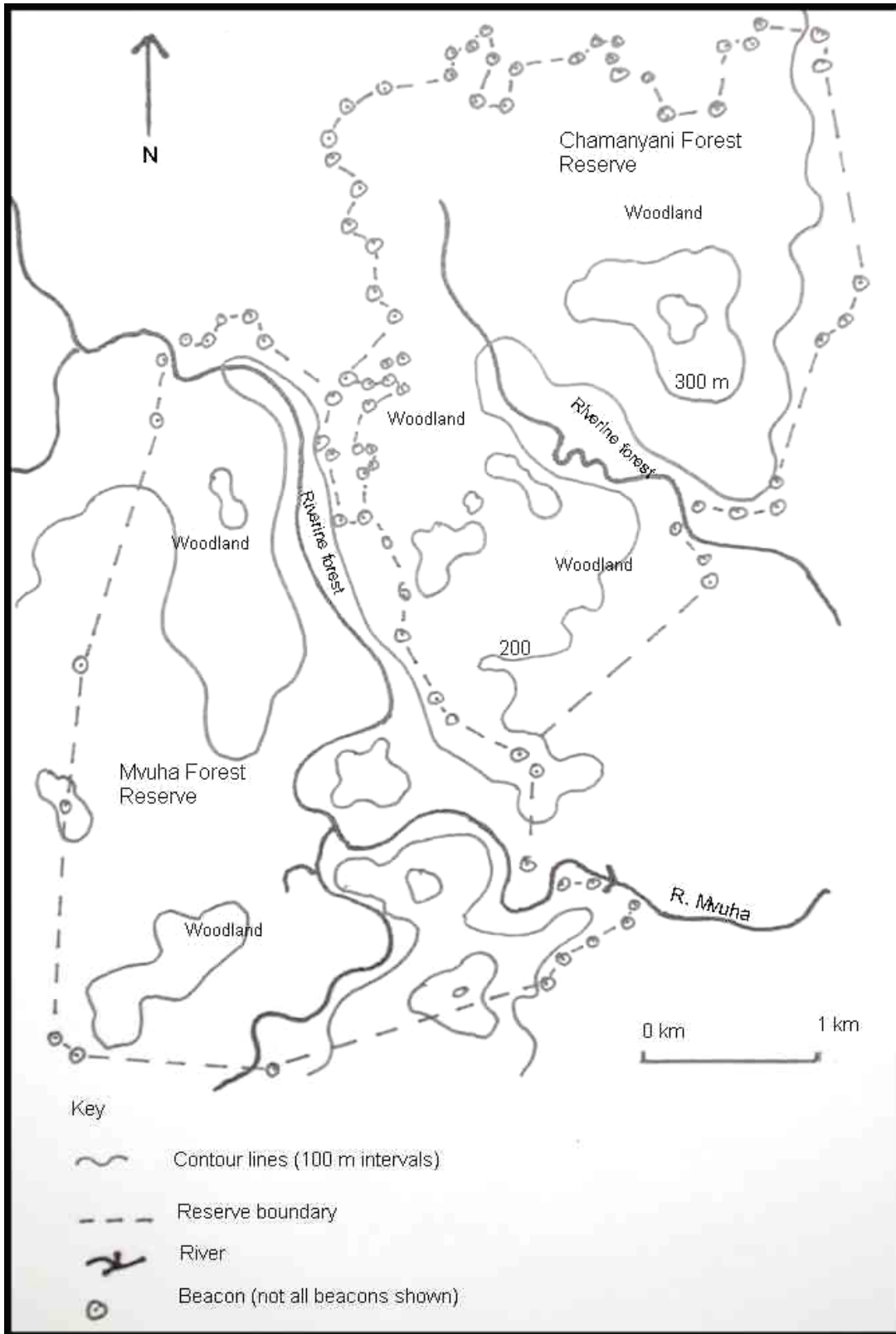
Woodland: Trees 5-10 m tall with: *Albizia versicolor*, *Brachystegia boehmii*, *B. spiciformis*, *Cassia abbreviata*, *Pterocarpus angolensis* and *Sclerocarya caffra*.

Riverine forest: Canopy 20-25 m with: *Antiaris toxicaria*, *Khaya anthotheca*, *Milicia excelsa*, *Ricinodendron* sp., *Sorindeia madagascariensis* and *Sterculia appendiculata*. Cycads are common around the streams leading into Mvuha River.

Of the 76 specimens collected in Mvuha-Chamanyani 49 have been identified to species level (Table 35). These include 40 species from 20 families.

Plant species recorded in Mvuha-Chamanyani F.R. with ranges restricted to FTEA regions T3, K7, T6, T8, Z and P (i.e. the FTEA regions that include the Eastern Arc and Coastal Forests) include *Combretum chionanthoides*, *Chlorophytum filipendulum*, *Warneckea amaniensis*, *Dorstenia bicaudata*, *Coffea sessiliflora*, *Pavetta stenosepala* and *Cissus sciaphila*.

Figure 11. Location and boundary map for Mvuha/Chamanyani Forest Reserve



**Table 35.** Annotated list of plant species collected in Mvuha-Chamanyani Forest Reserve.

<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
<b>ACANTHACEAE</b>					
<i>Dicliptera umbellata</i>	(Vahl) Juss.	2700 (220?)	U2; T1,6,7; Ethiopia; Burundi; Cameroon	Shrub	
<i>Thunbergia kirkii</i>	Hook. f.	250	U3; K7; T6	Shrub	
<b>ADIANTHACEAE</b>					
<i>Adiantum capillus-veneris</i>	L.	250 - 3000	U1-4; K1,3,4,6,7; T1-8;		
<b>ARACEAE</b>					
<i>Stylochiton salaamicus</i>	N. E. Br.	0 - 820 m	K7;T3,6,8;Z;not known elsewhere.	Seasonally dormant herb.	Lowland and evergreen forest, wooded grassland, termite mounds;
<b>ASTERACEAE</b>					
<i>Synedrella nodiflora</i>	(L.) Gaertn.	20 -1500	T3,6; pantropical	Herb	
<b>COMBRETACEAE</b>					
<i>Combretum chionanthoides</i>	Engl. & Diels	50 - 170	K7; T3,6; not known elsewhere	Semi-scandent shrub or ? Tree.	Forest margins
<i>Combretum schumannii</i>	Engl.	0 - 1150	K4,7; T2,3,5,6,8; Malawi, Mozambique	Shrub or tree	Lowland rain forest, riverine forest and Brachystegia woodland to valley grassland.
<b>CONVOLVULACEAE</b>					
<i>Ipomoea urbaniana</i>	(Dammer) Hall. f.	0 - 1500	U2,4; K7; T3,6,8; eastern Congo Republic	Liane	Upland and lowland rain-forest, rarely in grassland.
<i>Jacquemontia paniculata</i>	(Burm. f.) Hall. f.	0 - 360	K7; T3,6,8; Z; P; Madagascar to SE Asia, Malaysia, tropical Australia and New Caledonia.	Twiner	Grassland, thickets and cultivation, often on sandy soil; in the coastal provinces.
<b>CRASSULACEAE</b>					
<i>Kalanchoe crenata</i>	(Andr.) Haw.	0 - 2300	U2-4; K3,5,7; T1-4, 6-8; Z; widespread in torpical Africa form Guinee to Angola, Central African Republic, Zaire, Rwanda, Burundi, Malawi, Zambiq, Zimbabwe, South Africa, Arabia, naturalised in tropical America, India and Malaysia	Herb	forest, bushland and grassland, mostly in moist and damp places, often among rocks by roadside in cultivated lands
<b>CUCURBITACEAE</b>					
<i>Momordica anigosantha</i>	Hook. f.	300 - 1220	U2,4; K4,7;T3, 6; Z; Mozambique	Climber	Lowland rain- and ground-water forest and forest remnants
<i>Peponium vogelii</i>	(Hook. f.)	80 - 2440	U2-4; K1,3-7; T1-3, 5-	Climber	Upland and lowland

<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
	Engl.		8; Z; west and Central tropical Africa from Ghaua eastwards to Ethiopia and southwards through the Congo Republic to Angola; Mozambique; Seychelles.		rain -and ground-water forest and upland bamboo thicket, also in woodland and bushland especially near open water.
<i>Zehneria scabra</i>	(L. f.) Sond.	80 - 3350	U1-4; K1-7; T1-8; Z; tropical Africa and South Africa, Arabia, peninsular India, Java, Philippines	Herb climbing or trailing	Rain and swamp or other ground water forest, riverine forest, grass thicket, seasonal swamp and damp places generally in bushland and woodland; also a weed of roadsides and plantations.
<b>EUPHORBIACEAE</b>					
<i>Acalypha fruticosa</i>	Forssk	0 - 1890	U1-3; K1-7; T1-3, 6, 7, ?8; Z; Sudan to Somalia and south to Burundi with outlying stations in Namibia, S. Malawi and C. Mozambique, So. Arabia, S. india, Ceylon, Burma	Shrub or small tree	Coastal and deciduous bushland and thicket, wooded grassland, often riverine, on rocky shores or outcrops, and in other places with local water catchment and less grass competition becoming common in over grazed places
<i>Acalypha ornata</i>	A. Rich	0 - 2000	U1-4; K2, ?4, 5-7; T1-8; from Nigeria to Eritrea and south to Angola, Botswana, Zimbabwe and Mozambique.	Woody herb or shrub	Forest undergrowth and edges, wooded grassland, deciduous woodland and thicket, often riverine or in rocky places, also in secondary associations and disturbed ground.
<i>Drypetes reticulata</i>	Pax	0 - 500 (1800)	K?1, 7; T3, 6-8; Z; Somalia, Mozambique, Zimbabwe, South Africa	Shrub or slender tree.	Evergreen forest and thicket, often riverine or in rocky places.
<i>Hymenocardia ulmoides</i>	Oliv.	50 - 1550	T3,5,6,8; from Cameroun south to Angola, east to S. Sundan and Tanzania and southeast to S. Africa.	Medium sized or small tree	Dry evergreen forest and associated bushland or thicket, persisting in wooded grassland and disturbed places.
<b>FABACEAE</b>					
<i>Chamaecrista mimosoides</i>	(L.) Standley	0 - 2740	Widespread in the tropics of the old world.	Herb	Clearings in forest, forest margins, wooded grassland, grassland, cultivated and waste



Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
					ground, sandy river beds, lake and sea shores.
<i>Desmodium gangeticum</i>	(L.) DC.	0 - 2000	U1-4; K3,4,7; T2-4, 6-8; Z; throughout the old world tropics; said to be introduced in America.	Perennial herb	Deciduous woodland, wooded and open grassland, riverine forest and swampy places.
<i>Indigofera rhynchocarpa</i>	Bak.	500 - 2150	T1-8; Central African Republic, Congo, Rwanda, Burundi, Mozambique, Malawi, Zambia, Rhodesia and Angola	Shrub	Brachystegia woodland
<i>Pueraria phaseoloides</i>	(Roxb.) Benth.	0 - 1260	T?1; Z; E. Asia, Malesia and Indonesia, now widely cultivated in the tropics.	Climber	Grassland and bushland
<i>Rhynchosia luteola</i>	(Hiern) K. Schum.	300 - 1350	T3, 4, 6-8; Nigeria, Congo, Burundi, Mozambique, Malawi, Rhodesia and Angola.	Robust sticky climber	Evergreen forest margins, Brachystegia, Uapaca woodland, bushland
<i>Senna hirsuta</i>	(L) Irwin & Barneby	550 - 1220	U4; T3,6; originally from topical America, but now established in various parts of the Old World tropics.	Shrubby herb	A naturalised weed of plantations and cultivated ground in lowland rain forest areas; said to be v. common in the old cultivation in Kimobza Forest Reserve.
FLACOURTIACEAE					
<i>Rawsonia lucida</i>	Harv. & Sond.	50 - 1900	U2,3; K4-7; T1-3, 6-8; P; Somali Republic, Sudan, Angola, Zaire, Malawi, Zambia, Rhodesia, Mozambique, Swaziland, South Africa	Shrub or tree	Understorey and shrub layer of lowland and upland rain forest, dry evergreen forest, semi-swamp and riverine forest.
LILIACEAE					
<i>Chlorophytum filipendulum</i>	Bak.	30 - 650	K7 T3,6; Z	Herb	Coastal or gallery evergreen dry to moist forests on rocks
MELASTOMATACEAE					
<i>Warneckea amaniensis</i>	Gilg	40 - 600	K7; T3,6; not known elsewhere	Shrub or small tree	Lowland rain-forest and riverine forest
MORACEAE					
<i>Dorstenia bicaudata</i>	Peter	800 - 900	T3; not known elsewhere.	Herb	Rain-forest.
<i>Dorstenia kameruniana</i>	Engl.	0 - 1300	U2,4; K7; T3,6,7; extending to Angola and Cameroun, also in W. Africa.	Shrub or undershrub	Undergrowth of evergreen forests. Sometimes in secondary growth.

<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
<b>ONAGRACEAE</b>					
<i>Ludwigia erecta</i>	L.	0 - 1100	T3,4,6,8; P; widespread in Tropical Africa.	Herb	Imperfectly known, probably various wet habitats.
<b>PIPERACEAE</b>					
<i>Piper umbellatum</i>	L.	(0-)150 - 1800 (- 2100)	U2-4; K1,3,4,5; T2-5,6,7; Z; Guinea Bissau to Angola, Zaire, Sao Tome, Bioko, So. Sudan, Mozambique, Malawi Zimbabwe, Seychelles, Madagascar, Mascareine is; pantropical	Shrub or woody herb	Evergreen forest undergrowth, swamp forest, elephant grass, river banks, old rubber plantations always in damp places
<b>POACEAE</b>					
<i>Panicum hirtum</i>	Kam. (Syn. P. heterostachyum Hack.)			Herb	
<b>RUBIACEAE</b>					
<i>Coffea sessiliflora</i>	Bridson	200	K7 and T6	Shrub	Forested hill slopes
<i>Cremspora triflora</i>	(Thonn.) K. Schum	0 - 700 (1225)	K7; T2,3,6-8; Z; P; ?Malawi, also cultivated in India	Shrub or small tree	Evergreen forest, fringing forest and bush, thicket;
<i>Didymosalpinx norae</i>	(Swynn.) Key	190 - 810	K7; T3,6,8; Mozambique, Zimbabwe.	Shrub or small tree	Evergreen forest, secondary forest, forest edges.
<i>Mitracarpus hirtus</i>	(L.) DC.	0 - 1500	U1-4; K5,7; T1, 3-6; 8; widespread in tropical Africa from Mauritania to Angola, Zaire and Central African Republic, Sudan, Malawi, Zambia, Seychelles and Cape Verde Islands als in India, Burma, Selangor, New Guinea and Narians Is, West Indies and tropica	Herb	Weed in cultivation, path sides, fallow land, also in secondary scrub and thicket, open dry rocky areas
<i>Oldenlandia echinulosa</i>	K. Schum.	900 - 1200	T4,6,8; Sierra Leone, Nigeria, Cameroun, Sudan, Rhodesia, Angola	Herb	Moist rock outcrops, damp soil by river in gallery forest.
<i>Pavetta stenosepala</i>	K. Schum.	0 - 1300 (1800)	K7; T3,6; Z; not known elsewhere.	Shrub	Evergreen forest or thickets and bushland
<b>STERCULIACEAE</b>					
<i>Dombeya shupangae</i>	K. Schum.	600	T2,3,4; Madagascar	Tree	
<b>VITACEAE</b>					
<i>Cayratia ibuensis</i>	(Hook. f.) Suess.	100 - 1490	U1-4; K?2,5,7; T1, 6,8; Nigeria, Cameroon, Central African	Herb	Edge of small forest patches and derived thickets, cleared land,

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
			Republic, burundi, Zaire, Egypt, Sudan, Zambia, Malawi, Zimbabwe, Mozambique and Angola		old termite mounds, sandy river banks, Papyrus swamps, sometimes a weed.
<i>Cissus sciaphila</i>	Gilg.	0 - 450	K7; T3,6,8; Z; P; not known elsewhere	Climber	Lowland forest, riverine forest fringes, woodland slopes above river valleys.

### 2.8.5 Mammals

Eleven species of mammal from eight families were recorded.

**Table 36.** Checklist of the mammals of Mvuha/Chamanyani.

Species	Common name	Most recent record
<b>COLOBIDAE</b>		
<i>Colobus angolensis</i>	Angola pied colobus	UMBCP 2000
<b>CERCOPITHECIDAE</b>		
<i>Papio cynocephalus</i>	Yellow baboon	UMBCP 2000
<i>Cercopithecus mitis</i> (possibly <i>moloneyi</i> )	Gentle monkey	UMBCP 2000
<b>GALAGONIDAE</b>		
<i>Otolemur garnettii</i>	Small-eared galago	UMBCP 2000
<i>Galagoides zanzibaricus</i>	Zanzibar galago	UMBCP 2000
<b>MACROSCOLIDINAE</b>		
<i>Petrodromus tetradactylus</i>	Four toed elephant shrew	UMBCP 2000
<b>SCIURIDAE</b>		
<i>Paraxerus palliatus</i>	Red-bellied coast squirrel	UMBCP 2000
<b>VIVERRIDAE</b>		
<i>Genetta tigrina</i>	Blotched genet	UMBCP 2000
<i>Civettictis civetta</i>	African civet	UMBCP 2000
<b>SUIDAE</b>		
<i>Potamochoerus larvatus</i>	Bush pig	UMBCP 2000
<b>BOVIDAE</b>		
<i>Cephalophus monticola</i>	Blue duiker	UMBCP 2000

### 2.8.6 Birds

Sixty species of bird from 28 families were recorded.

**Table 37.** Checklist of the birds of Mvuha/Chamanyani.

Species	Common name	Most recent record
<b>SCOPIDAE</b>		
<i>Scopus umbretta</i>	Hamerkop	UMBCP 2000
<b>ACCIPITRIDAE</b>		
<i>Accipiter tachiro</i>	African goshawk	UMBCP 2000
<i>Accipiter minullus</i>	Little sparrowhawk	UMBCP 2000
<i>Gypohierax angolensis</i>	Palm-nut vulture	UMBCP 2000
<i>Stephanoaetus coronatus</i>	African crowned eagle	UMBCP 2000
<b>COLUMBIDAE</b>		
<i>Turtur tympanistria</i>	Tambourine dove	UMBCP 2000
<i>Turtur afer</i>	Blue-spotted wood dove	UMBCP 2000
<i>Streptopelia semitorquata</i>	Red-eyed dove	UMBCP 2000

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>PSITTACIDAE</b>		
<i>Poicephalus robustus</i>	Brown-necked parrot	UMBCP 2000
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's Turaco	UMBCP 2000
<b>STRIGIDAE</b>		
<i>Strix woodfordii</i>	African wood owl	UMBCP 2000
<b>APODIDAE</b>		
<i>Apus affinis</i>	Little swift	UMBCP 2000
<b>TROGONIDAE</b>		
<i>Apaloderma narina</i>	Narina's trogon	UMBCP 2000
<i>Apaloderma vittatum</i>	Bar-tailed trogon	UMBCP 2000
<b>ALCEDINIDAE</b>		
<i>Ispidina picta</i>	African pygmy kingfisher	UMBCP 2000
<i>Megaceryle maxima</i>	Giant kingfisher	UMBCP 2000
<b>PHOENICULIDAE</b>		
<i>Phoeniculus purpureus</i>	Green wood-hoopoe	UMBCP 2000
<b>BUCEROTIDAE</b>		
<i>Tockus alboterminatus</i>	Crowned hornbill	UMBCP 2000
<i>Bycanistes bucinator</i>	Trumpeter hornbill	UMBCP 2000
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	UMBCP 2000
<b>CAPITONIDAE</b>		
<i>Stactolaema leucotis</i>	White-eared barbet	UMBCP 2000
<i>Pogoniulus simplex</i>	Eastern green tinkerbird	UMBCP 2000
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	UMBCP 2000
<b>INDICATORIDAE</b>		
<i>Indicator minor</i>	Lesser honeyguide	UMBCP 2000
<b>PICIDAE</b>		
<i>Dendropicos fuscescens</i>	Cardinal woodpecker	UMBCP 2000
<b>EURYLAIMIDAE</b>		
<i>Smithornis capensis</i>	African broadbill	UMBCP 2000
<b>MOTACILLIDAE</b>		
<i>Motacilla aguimp</i>	African pied wagtail	UMBCP 2000
<b>HIRUNDINIDAE</b>		
<i>Hirundo senegalensis</i>	Mosque swallow	UMBCP 2000
<i>Psalidoprocne pristoptera</i>	Black saw-wing	UMBCP 2000
<b>PYCNONOTIDAE</b>		
<i>Andropadus virens</i>	Little greenbul	UMBCP 2000
<i>Andropadus masukuensis</i>	Shelley's greenbul	UMBCP 2000
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	UMBCP 2000
<i>Phyllastrephus fischeri</i>	Fischer's greenbul	UMBCP 2000
<i>Phyllastrephus flavostriatus</i>	Yellow-streaked greenbul	UMBCP 2000
<i>Phyllastrephus debilis</i>	Tiny greenbul	UMBCP 2000
<i>Pycnonotus barbatus</i>	Common bulbul	UMBCP 2000
<b>TURDIDAE</b>		
<i>Pogonocichla stellata</i>	White-starred robin	UMBCP 2000
<i>Cossypha natalensis</i>	Red-capped robin-chat	UMBCP 2000
<i>Alethe fuelleborni</i>	White-chested alethe	UMBCP 2000
<i>Neocossyphus rufus</i>	Red-tailed ant thrush	UMBCP 2000
<i>Zoothera gurneyi</i>	Orange ground thrush	UMBCP 2000
<i>Turdus olivaceus</i>	Olive thrush	UMBCP 2000
<b>SYLVIIDAE</b>		
<i>Camaroptera brachyura</i>	Grey-backed camaroptera	UMBCP 2000
<i>Melocichla mentalis</i>	African moustached warbler	UMBCP 2000
<b>MONARCHIDAE</b>		
<i>Trochocercus cyanomelas</i>	Crested flycatcher	UMBCP 2000

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Terpsiphone viridis</i>	Paradise flycatcher	UMBCP 2000
<b>PLATYSTEIRIDAE</b>		
<i>Batis mixta</i>	Forest batis	UMBCP 2000
<i>Platysteira peltata</i>	Black-throated wattle-eye	UMBCP 2000
<b>MALACONOTIDAE</b>		
<i>Malaconotus nigrifrons</i>	Black-fronted bush-shrike	UMBCP 2000
<i>Laniarius aethiopicus</i>	Tropical boubou	UMBCP 2000
<i>Dryoscopus cubla</i>	Black-backed puffback	UMBCP 2000
<b>DICRURIDAE</b>		
<i>Dicrurus adsimilis</i>	Common drongo	UMBCP 2000
<i>Dicrurus ludwigii</i>	Square-tailed drongo	UMBCP 2000
<b>CORVIDAE</b>		
<i>Corvus albicollis</i>	White-naped raven	UMBCP 2000
<b>NECTARINIIDAE</b>		
<i>Anthreptes collaris</i>	Collared sunbird	UMBCP 2000
<i>Nectarinia olivacea</i>	Olive sunbird	UMBCP 2000
<b>PLOCEIDAE</b>		
<i>Ploceus bicolor</i>	Dark-backed weaver	UMBCP 2000
<b>ESTRILDIDAE</b>		
<i>Mandingoa nitidula</i>	Green-backed twinspot	UMBCP 2000
<i>Hypargos niveoguttatus</i>	Peter's twinspot	UMBCP 2000

### 2.8.7 Reptiles

Six species of reptile from five families were recorded.

**Table 38.** Checklist of the reptiles of Mvuha/Chamanyani.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>TESTUNDINIDAE</b>		
<i>Kinixys belliana</i>	South-eastern hinge-back tortoise	UMBCP 2000
<b>GEKKONIDAE</b>		
<i>Hemidactylus platycephalus</i>	Baobab gecko	UMBCP 2000
<b>CHAMAELEONIDAE</b>		
<i>Chamaeleo dilepis</i>	Common flap-necked chameleon	UMBCP 2000
<i>Rhampholeon brevicaudatus</i>	Bearded pigmy chameleon	UMBCP 2000
<b>BOIDAE</b>		
<i>Python sebae</i>	Southern African python	UMBCP 2000
<b>VIPERIDAE</b>		
<i>Bitis arietans</i>	Puff adder	UMBCP 2000

### 2.8.8 Amphibians

Nine species of amphibian from five families were recorded.

**Table 39.** Checklist of the amphibians of Mvuha/Chamanyani.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>ARTHROLEPTIDAE</b>		
<i>Arthroleptis stenodactylus</i>		UMBCP 2000
<i>Arthroleptis xenodactyloides</i>		UMBCP 2000
<b>HYPEROLIDAE</b>		
<i>Afrixalus fornasinii</i>	Greater leaf-folding frog	UMBCP 2000
<i>Afrixalus brachycnemis</i>		UMBCP 2000
<i>Leptopelis flavomaculatus</i>		UMBCP 2000
<b>PIPIDAE</b>		

Species	Common name	Most recent record
<i>Xenopus muelleri</i>		UMBCP 2000
RANIDAE		
<i>Phrynobatrachus acridoides</i>		UMBCP 2000
<i>Ptychadena</i> sp.		UMBCP 2000
<i>Afrana angolensis</i>	Common river frog	UMBCP 2000

### 2.8.9 Biodiversity

The reserve has many species typical of lowland forests. The *Cercopithecus mitis* appear to be quite different to blue monkeys in the Usambara Mountains. Red fur extends from between the shoulders to the base of the tail on males and females, the forelegs and hind legs are black as is the nose and mouth. They are closer to the picture of *Cercopithecus m. moloneyi* in Kingdon (1997).

### 2.8.10 Catchment values

The reserve protects a number of small catchments feeding into the Mvuha river, and the banks of the Mvuha river itself. There are seasonal water courses in the woodland.

### 2.8.11 Human impacts

There is pitsawing in the reserve although most of the *Milicia excelsa* and *Khaya anthotheca* were extracted from the reserve many years ago. In the 1980's the reserve was encroached due to lack of boundary marking. The marking of the boundary has not been completed and beacons are missing. Along the Mvuha river miners are panning for rubies and gold. They have established camps on the banks of the river. Building poles and firewood are taken for local use. Fire occurs every year. Ancient graves are marked on the 1910 border map on the western side of Mvuha FR. Maasai graze their cattle in the east of the reserve.

### 2.8.12 Management proposals

South of the river Mvuha the eastern boundary is marked by *Cedrela* sp. Otherwise the boundary needs to be cleared and planted.

Fire needs to be controlled and building pole and fuel wood plantations established on boundaries in areas of high population.

The impact of the mining should be carefully monitored. Checks should be made to ensure that mercury is not being used to extract the gold in the vicinity of the river.

### 2.8.13 Literature

Lovett, J.C. & T. Pócs (1993). Assessment of the condition of the Catchment Forest Reserves, a botanical appraisal. Catchment Forestry Report 93.3, Dar es Salaam. 300 pp.

## 2.9 Ngambaula Local Authority Forest Reserve

Morogoro District, Morogoro Region

Morogoro Division

Year of establishment	:	
Declaration	:	Sch.
Revocation order	:	339/9/9/1955
Border map	:	B/Print
Topographical maps	:	183/4
Gazetted area	:	2.8 ha
Gazetted boundary length	:	

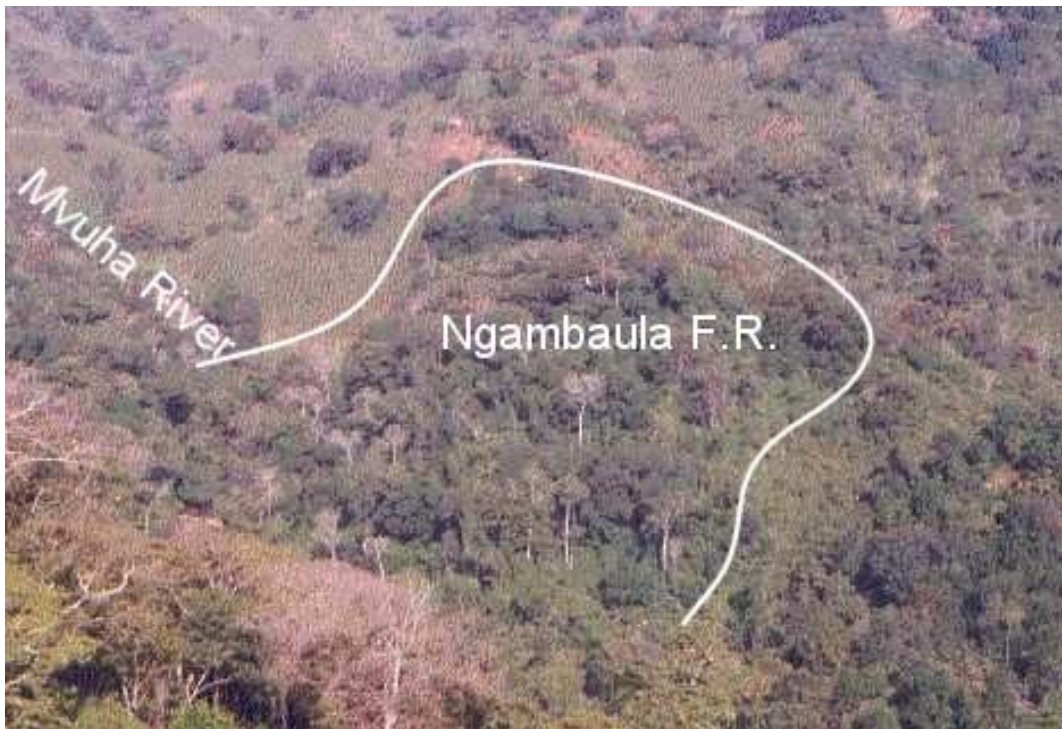
### 2.9.1 Location

06° 59' S 037° 44' E

Travelling south on the Morogoro - Kisaki road turn right just after Mkuyuni towards Changa. The reserve is on a steep north-facing slope above the Mvuha River covering an altitude of 280 m to 500 m asl. There are many rock outcrops. The Mvhuva River forms the northern border.

See 2.5.1 for a sketch map showing the location of Ngambaula Forest Reserve.

**Figure 12.** Looking south across the Mvuha valley towards Ngambaula L.A. Forest Reserve



### 2.9.2 Vegetation

Dry lowland forest with an open canopy at 20 m with emergents reaching over 30m. There is a mixed canopy of *Sorindeia madagascariensis*, *Albizia gummifera*, *Tabernaemontana elegans*, *Syzygium guineense*, *Diospyros mespiliformis*, *Newtonia buchanani* and *Bombax rhodognaphalon*. In the understory there is *Psychotria* sp. and *Ketia* sp. At the forest edge there is *Dalbergia metidula* and outside of the forest there is *Brachystegia* sp.

Of the 18 specimens collected in Ngambaula 11 have been identified to species level. These include 10 species from 10 families (Table 40).

Plant species recorded in Ngambaula F.R. with ranges restricted to FTEA regions T3, K7, T6, T8, Z and P (i.e. the FTEA regions that include the Eastern Arc and Coastal Forests) include *Solanum richardii*.

**Table 40.** Annotated list of plant species collected in Ngambaula Forest Reserve

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<b>FABACEAE</b>					
<i>Vigna reticulata</i>	Hook. f.	0 - 2460	U1-4; K3,7; T1,3,4,6-8; Z; widespread in tropical Africa from Sierra Leone to Angola, Ethiopia, Mozambique and Rhodesia, also in Madagascar.	Climbing herb	Grassland, bushland or grassland with scattered trees, usually on damp or swampy ground.
<b>ICACINACEAE</b>					
<i>Leptaulus holstii</i>	(Engl.) Engl.	700 - 1200	U4; T1,3-6, 8; Congo Republic and Angola	Shrub or small tree	Lowland rain forest.
<b>LOGANIACEAE</b>					
<i>Strychnos usambarensis</i>	Gilg	75 - 2000	U1-3; K4,6; T3,5; Mozambique, Zimbabwe and South Africa.	Tree or shrub	
<b>MENISPERMACEAE</b>					
<i>Dioscoreophyllum volkensii</i>	Engl.	1140	K7; T3,6,7; P; W. Africa	Creepers	
<b>MORACEAE</b>					
<i>Dorstenia zanzibarica</i>	Oliv.	0 - 2400	K4,6,7; T2,3,6?Z; not known elsewhere	Herb	Rocks, cliffs, epiphytic or in ground humus, in various habitats for forest to succulent and deciduous bushland and thicket.
<b>OCHNACEAE</b>					
<i>Ouratea sacleuxii</i>	(Tiegh.) Beentje			Tree	
<b>OXALIDACEAE</b>					
<i>Oxalis corniculata</i>	L.	10 - 2950	U1-4; K2-7; T1-4, 6-8; Z; P; widespread in most tropical and many temperate countries	Herb	weed in cultivation, disturbed ground, lawns and roadsides.
<b>SOLANACEAE</b>					
<i>Solanum richardii</i>	Dunal	80 - 1000	T3,6; Z; P	Shrub	
<b>STERCULIACEAE</b>					
<i>Leptonychia usambarensis</i>	K. Schum.			Tree or shrub	
<b>VIOLACEAE</b>					
<i>Rinorea elliptica</i>	(Oliv.) Kuntze	50 - 600	K7; T2,3,6,8; Mozambique, Malawi	Shrub or small tree	Lowland evergreen rain forest



### 2.9.3 Mammals

Four species of mammal from four families were recorded.

**Table 41.** Checklist of the mammals of Ngambaula.

Species	Common name	Most recent record
<b>COLOBIDAE</b>		
<i>Colobus angolensis</i>	Angola pied colobus	UMBCP 2000
<b>CERCOPITHECIDAE</b>		
<i>Cercopithecus aethiops</i>	Savannah monkey	UMBCP 2000
<b>PTEROPODIDAE</b>		
<i>Rousettus aegyptiacus</i>	Rousette bat	UMBCP 2000
<b>BOVIDAE</b>		
<i>Cephalophus monticola</i>	Blue duiker	UMBCP 2000

### 2.9.4 Birds

Thirty-nine species of bird from 23 families were recorded.

**Table 42.** Checklist of the birds of Ngambaula.

Species	Common name	Most recent record
<b>SCOPIDAE</b>		
<i>Scopus umbretta</i>	Hamerkop	UMBCP 2000
<b>ACCIPITRIDAE</b>		
<i>Accipiter tachiro</i>	African goshawk	UMBCP 2000
<i>Gypohierax angolensis</i>	Palm-nut vulture	UMBCP 2000
<i>Stephanoaetus coronatus</i>	African crowned eagle	UMBCP 2000
<b>SCOLOPACIDAE</b>		
<i>Actitis hypoleucos</i>	Common sandpiper	UMBCP 2000
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's Turaco	UMBCP 2000
<b>APODIDAE</b>		
<i>Apus affinis</i>	Little swift	UMBCP 2000
<b>TROGONIDAE</b>		
<i>Apaloderma narina</i>	Narina's trogon	UMBCP 2000
<b>ALCEDINIDAE</b>		
<i>Ispidina picta</i>	African pygmy kingfisher	UMBCP 2000
<b>BUCEROTIDAE</b>		
<i>Tockus alboterminatus</i>	Crowned hornbill	UMBCP 2000
<i>Bycanistes bucinator</i>	Trumpeter hornbill	UMBCP 2000
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	UMBCP 2000
<b>CAPITONIDAE</b>		
<i>Stactolaema leucotis</i>	White-eared barbet	UMBCP 2000
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	UMBCP 2000
<b>EURYLAIMIDAE</b>		
<i>Smithornis capensis</i>	African broadbill	UMBCP 2000
<b>MOTACILLIDAE</b>		
<i>Motacilla aguimp</i>	African pied wagtail	UMBCP 2000
<b>HIRUNDINIDAE</b>		
<i>Psalidoprocne pristoptera</i>	Black saw-wing	UMBCP 2000
<b>PYCNONOTIDAE</b>		
<i>Andropadus virens</i>	Little greenbul	UMBCP 2000
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	UMBCP 2000
<i>Phyllastrephus cerviniventris</i>	Grey-olive greenbul	UMBCP 2000
<i>Phyllastrephus flavostriatus</i>	Yellow-streaked greenbul	UMBCP 2000
<i>Pycnonotus barbatus</i>	Common bulbul	UMBCP 2000
<b>TIMALIIDAE</b>		

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Illadopsis rufipennis</i>	Pale-breasted illadopsis	UMBCP 2000
<b>TURDIDAE</b>		
<i>Pogonocichla stellata</i>	White-starred robin	UMBCP 2000
<i>Zoothera gurneyi</i>	Orange ground thrush	UMBCP 2000
<b>SYLVIIDAE</b>		
<i>Camaroptera brachyura</i>	Grey-backed camaroptera	UMBCP 2000
<b>MONARCHIDAE</b>		
<i>Trochocercus cyanomelas</i>	Crested flycatcher	UMBCP 2000
<i>Terpsiphone viridis</i>	Paradise flycatcher	UMBCP 2000
<b>PLATYSTEIRIDAE</b>		
<i>Batis mixta</i>	Forest batis	UMBCP 2000
<b>MALACONOTIDAE</b>		
<i>Malaconotus nigrifrons</i>	Black-fronted bush-shrike	UMBCP 2000
<i>Laniarius aethiopicus</i>	Tropical boubou	UMBCP 2000
<i>Dryoscopus cubla</i>	Black-backed puffback	UMBCP 2000
<b>DICRURIDAE</b>		
<i>Dicrurus adsimilis</i>	Common drongo	UMBCP 2000
<i>Dicrurus ludwigii</i>	Square-tailed drongo	UMBCP 2000
<b>NECTARINIIDAE</b>		
<i>Anthreptes collaris</i>	Collared sunbird	UMBCP 2000
<i>Nectarinia olivacea</i>	Olive sunbird	UMBCP 2000
<b>PLOCEIDAE</b>		
<i>Ploceus bicolor</i>	Dark-backed weaver	UMBCP 2000
<b>ESTRILDIDAE</b>		
<i>Mandingoa nitidula</i>	Green-backed twinspot	UMBCP 2000
<i>Hypargos niveoguttatus</i>	Peter's twinspot	UMBCP 2000

### 2.9.5 Reptiles

Two species of reptile from two families were recorded.

**Table 43.** Checklist of the reptiles of Ngambaula.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>GEKKONIDAE</b>		
<i>Hemidactylus platycephalus</i>	Baobab gecko	UMBCP 2000
<b>VARANIDAE</b>		
<i>Varanus niloticus</i>	Nile monitor	UMBCP 2000

### 2.9.6 Amphibians

Four species of amphibian from three families were recorded.

**Table 44.** Checklist of the amphibians of Ngambaula.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>ARTHROLEPTIDAE</b>		
<i>Arthroleptis stenodactylus</i>	Shovel-footed squeaker	UMBCP 2000
<i>Arthroleptis xenodactyloides</i>		UMBCP 2000
<b>BUFONIDAE</b>		
<i>Bufo maculatus</i>		UMBCP 2000
<b>MICROHYLIDAE</b>		
<i>Spelaeophryne methneri</i>		UMBCP 2000

### 2.9.7 Catchment values

The reserve is adjacent to the Mvuha River.

#### 2.9.8 Human impacts

In the south of the reserve at the top of the hill, forest within the reserve has been cleared for rice cultivation. The stumps of the forest trees are still visible and some *Milicia excelsa* stumps were coppicing.

Pitsaws were observed throughout the reserve. Most were on dry river beds, which are used as shutes to transport the planks down the steep slopes. Timber being taken included *Milicia excelsa*, Mkongo and *Cussonia zimmermannii*. The removal of many tall trees has opened up the canopy so that the understorey is now scrubby and dominated by thorny woodland plants.

A local villager specialises in providing colobus and blue monkey skins for trade in Arusha. Duikers are also hunted.

#### 2.9.9 Management proposals

Forest clearance for rice cultivation is of concern. The District Forest Office needs to halt to the forest clearance. This should be followed up by clarification with local communities about the protected status of the forest and more community involvement in managing the forest.

The boundaries need to be clearly marked and missing beacons should be replaced. Fire breaks need to be cleared. No map of the reserve was available from the Forestry and Beekeeping Division. If no copies can be retrieved then a new map should be prepared.

The trade in colobus should be halted as the reserve's population is already under pressure from habitat loss.

#### 2.9.10 Literature

None known.

## 2.10 Ruvu Catchment Forest Reserve

Morogoro District, Morogoro Region

Morogoro Division

Year of establishment

: 1955

Declaration

: GN 200 of 3/6/55

Variation order

: Initiated in 1982 (Jb 2065) but not yet legally finalized

Border map

: Jb 225, Jb 2065 (1:25 000) 1982

Topographical map

: 183/4, 201/2

Gazetted area

: 3093 ha, 2983 ha on Jb 2065

Gazetted boundary length

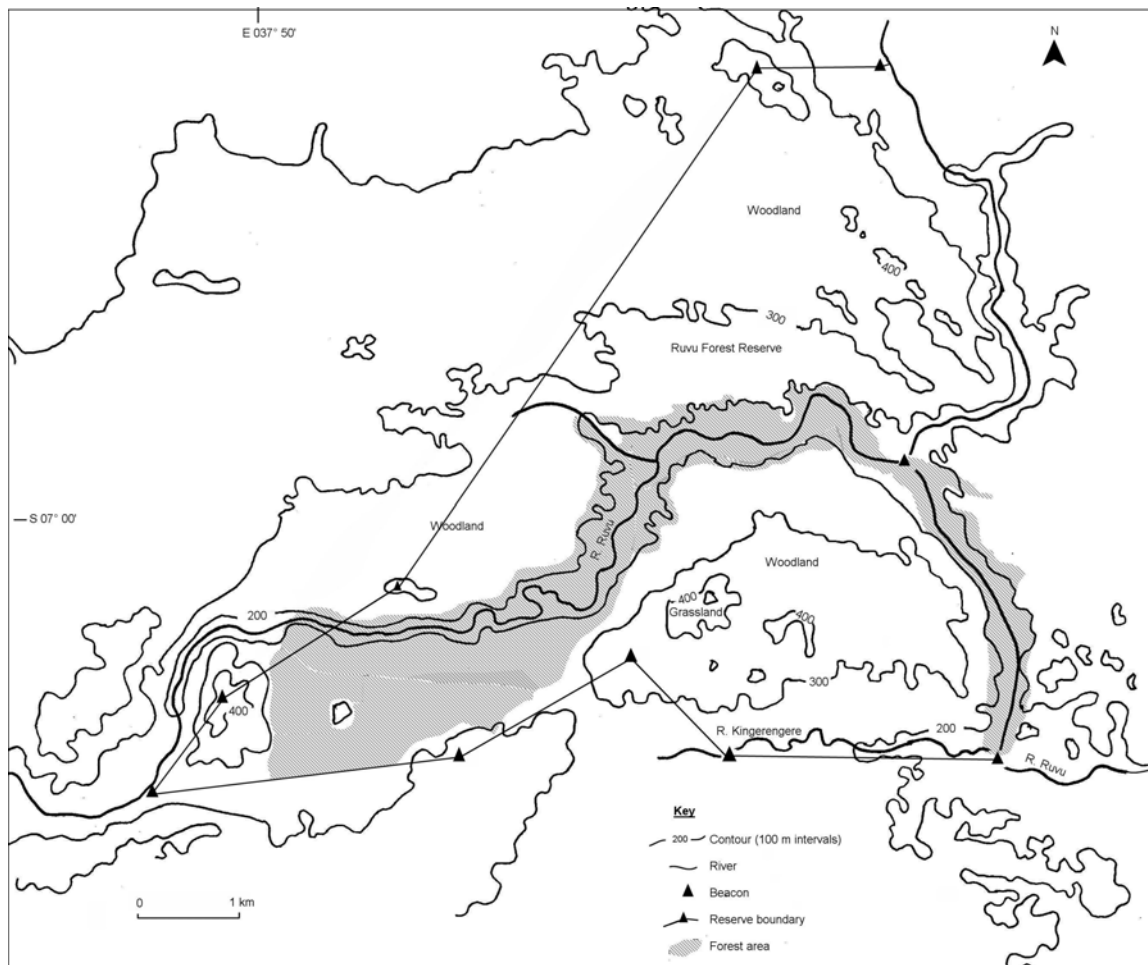
: 29 km on Jb 2065

### 2.10.1 Location

6° 53' - 7° 02' S 37° 49' - 37° 54' E

Access is from the Mkuyuni to Matombo road. The reserve is in the eastern Uluguru mountain foothills, covering a plateau on either side of the Ruvu River gorge at an altitude of to 200 m to 480 m asl.

**Figure 13.** Sketch map of Ruvu Forest Reserve



### 2.10.2 Soils

Tropical rendzina on dolomitic marble (in the western half) and red ferralitic latosols on Precambrian granulite and gneiss (in the eastern half).

### 2.10.3 Climate

Oceanic rainfall with oceanic temperatures. Nearest rainfall station: Kibungo. Estimated rainfall: 1800 mm/year on the western edge with peaks in Dec. and May, decreasing rapidly eastwards. Dry season: July to Sept. on the western edge, longer in the east of the reserve. Temperature: 28° C max (Dec.), 23° C min (July).

### 2.10.4 Vegetation

The western half of the reserve is covered with seasonal lowland forest.

Lowland forest: Canopy trees include: *Albizia gummifera*, *Khaya anthotheca* (formerly *K. nyasica*), *Milicia excelsa*, *Parkia filicoidea*, with *Barringtonia racemosa* on the stream bank. Smaller trees include: *Scorodophloeus fischeri* with *Acridocarpus cf. scheffleri*, *Meineckia fruticans*, *Pycnocomma macrantha*, *Rawsonia reticulata*, *Afrosersalisia cerasifera*, *Diospyros* sp. Shrubs include: *Dorstenia cameruniae* and *Psychotria cf. riparia*.



**Figure 14.** Looking north over Ruvu Forest Reserve.

In the east there is mixed woodland with *Brachystegia* sp. and *Acacia* sp. At the transition between lowland forest and woodland *Acacia polyocantha*, *Annona senegalensis*, *Markhamia obtusifolia* and *Lannea stuhlmannii* are common.

Of the 83 specimens collected in Ruvu 71 have been identified to species level (Table 45). These include 66 species from 28 families.

Plant species, sub-species and varieties recorded in Ruvu F.R. with ranges restricted to FTEA regions T3, K7, T6, T8, Z and P (i.e. the FTEA regions that include the Eastern

Arc and Coastal Forests) include *Ophrypetalum odoratum* subsp. *longipedicellatum*, *Euphorbia quadrialata*, *Meineckia fruticans* var. *engleri*, *Ormocarpum sennooides* subsp. *zanzibaricum*, *Rhynchosia congesta* subsp. *pseudobuettneri*, *Grevea eggelingii* subsp. *eggelingii*, *Pandanus rabaiensis*, *Pavetta crebrifolia* var. *kimbozensis*, *Solanum richardii*, *Rinorea squamosa* subsp. *kaessneri* and *Cyphostemma braunii*.

**Table 45.** Annotated list of plant species collected in Ruvu Forest Reserve.

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<b>ACANTHACEAE</b>					
<i>Asystasia gangetica</i>	(L.) T. Anderson	1600 (250 - 2000)	K1,4,5,6,7; T1,2,3,4,5,6,7,8; Z; P; U4; Rwanda and Seychelles; pantropical	Herb	
<i>Asystasia</i> sp. nov. aff. <i>A. leptostachya</i>	Lindau (Polhill 4640, etc.)				
<i>Hypoestes forskoolii</i>	(Vahl) R. Br.	200 - 590	T1,2,3,4,5,6,7; tropical Africa	Shrub	
<i>Justicia scandens</i>	Vahl	250		Herb	
<i>Justicia striata</i>	(Klotzsch) Bullock	250	K1,4,6; T1,2,3,6,7; U2; Malawi, Zimbabwe, Zambia, Mozambique, Cameroon, Ghana	Herb	
<i>Phaulopsis imbricata</i>	(Forssk.) Sweet	450 - 750	U2,4; K1,3,4,5,6,7; T1,2,3,4,6,7; Z; P; Malawi, Burundi, Cameroon, Gabon, Republic of Congo	Shrub	
<i>Pseuderanthemum hildebrandtii</i>	Lindau	1000 - 2500	K1,4,6,7; T2,3,6,8; Cameroon	Shrub	
<b>ANACARDIACEAE</b>					
<i>Sorindeia madagascariensis</i>	Thouars ex DC.	1 - 1830	K4,7; T2,3,5-8; P; Z; Malawi, Mozambique, Mascarene Islands, Madagascar	Evergreen tree	Riverine, coastal and upland forest, often in wet or seasonally flooded places.
<b>ANNONACEAE</b>					
<i>Monodora grandidieri</i>	Baill.	250	K7; T3,6,8; Z; Somalia, Mozambique and Malawi	Shrub	
<i>Monodora junodii</i>	Engl. & Diels	1 - 1590	T3,5,6,8; Mozambique, Malawi, Zimbabwe, S. Africa	Shrub	
<i>Ophrypetalum odoratum</i> subsp. <i>longipedicellatum</i>	Verdc.	200 - 450	T6	Shrub	
<b>APOCYNACEAE</b>					
<i>Tabernaemontana ventricosa</i>	Hochst. ex A. DC.		U2,4; K3-7; T1,2,3,6-8; Z; P; Malawi, Zambia, Zaire, Cameroon	Shrub	
<b>ASCLEPADACEAE</b>					
<i>Kanahia laniflora</i>	(Forssk.) R. Br.		T3,6; Ethiopia, Sudan, W. and S. Africa, Yemen	Shrub	

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<b>ASTERACEAE</b>					
<i>Vernonia aemulans</i>	Vatke	1 - 1900	K4,6,7; T2-4,6-8; not known elsewhere	Annual herb	Disturbed sites such as roadsides, old cultivations, also in grassland, woodland, wooded grassland and bushland
<i>Vernonia glabra</i>	(Steetz) Vatke	0 - 2100	K1,4,5; T1-8; Z; Congo, Zambia, Malawi, Mozambique, Zimbabwe, Namibia, Botswana, South Africa	Perennial herb	Dry grassland, waste places like roadsides, woodland, grassland in the woodland zone
<i>Vernonia stuhlmannii</i>	O. Hoffm.	350 - 1200	T3?,5,6,8; not known elsewhere	Woody herb or weak shrub	Woodland, wooded grassland and thickets
<b>CONVOLVULACEAE</b>					
<i>Ipomoea urbaniana</i>	(Dammer) Hall. f.	0 - 1500	U2,4; K7; T3,6,8; eastern Congo Republic	Liane	Upland and lowland rain-forest, rarely in grassland.
<b>CUCURBITACEAE</b>					
<i>Coccinia grandis</i>	(L.) Voigt	0 - 1680	U1-4; K1,2,4,5,7; T1-3, 6,8; Z northern tropical Africa eastwards from Senegal to Somali republic; Arabia; South America	Climber	Deciduous bushland, woodland and wooded grassland, dry evergreen forest and evergreen woodland.
<b>EUPHORBIACEAE</b>					
<i>Bridelia cathartica</i>	Bertol. F.	0 - 2000	K7; T1-8; Z; P; from Sudan, Ethiopia, and Somalia south-west to Zaire and south to South Africa	Shrub or small tree	woodland, bushland and thicket, commonly riverine or in rocky places, persisting to secondary associations
<i>Dalechampia scandens</i> var. <i>hildebrandtii</i>	L.	0 - 1500	U1: K1-4, 6,7; T 2-7; Cape Verde Is. To S. Arabia, Pakistan and India south to Angola and Mozambique.	Twiner	Deciduous, coastal and riverine bushland and thicket often in rocky or seasonally wet places, extending into disturbed habitats.
<i>Euphorbia quadrialata</i>	Pax	400 - 1300	T3, 6; not known elsewhere.	Tree	Rocky slopes and gneiss outcrops with open deciduous bushland.
<i>Meineckia fruticans</i> var. <i>engleri</i>	(Pax) Webster	30 - 220	K7; T3; not known elsewhere.	Shrub	On coral and other rock outcrops, in lowland wet evergreen and riparian forest.
<i>Meineckia fruticans</i> var. <i>fruticans</i>	(Pax) Webster	6 - 1000	K7; T3,4,6,7; not known elsewhere.	Shrub	Limestone and coral outcrops, rocky, sometimes riverine places in forest and coastal bushland.
<i>Mildbraedia caprinifolia</i>	(Pax) Hutch.	0 - 1675	K7; T3,4,6,8; Z; Mozambique	Shrub or small tree.	Forest undergrowth and edges, coastal woodland, riverine and secondary associations
<i>Phyllanthus</i>	Por.	0 - 2450	U1 - 4; K1-5; T1-8; Z;	Woody	woodland, wooded

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<i>nummulariifolius</i>			P; from Sierra Leone to Sudan and south to South Africa; also in Madagascar, Mascarene Islands and Seychelles	herb or shrub	grassland and forest edges, extending to upland grassland and bushland, often in seasonally wet and disturbed places.
<i>Suregada zanzibariensis</i>	Baill.	0 - 1600	K7; T3,6,8; Z; P. Somalia, Mozambique, Zimbabwe, Madagascar and South Africa	Shrub or small to large tree.	Coastal forest, woodland and bushland, common in places, occasionally found in similar places inland and at much higher altitudes.
<b>FABACEAE</b>					
<i>Chamaecrista mimosoides</i>	(L.) Standley	0 - 2740	Widespread in the tropics of the old world.	Herb	Clearings in forest, forest margins, wooded grassland, grassland, cultivated and waste ground, sandy river beds, lake and sea shores.
<i>Crotalaria laburnoides</i>	Klotzsch	0 - 1250	U; K7; T3,5,6,8; Z,P.	Erect annual	Grassland, sand dunes, coral outcrops and bushland near coast, less commonly in land at lake sides and in deciduous bushland, also persisting on cultivated ground and waste places.
<i>Crotalaria vasculosa</i>	Benth.	0 - 1650	U4; K5,7; T1-3, 5,6,8; Z; Mozambique, Malawi, Rhodesia and South Africa.	Annual	Grassland and Brachystegia woodland, often on sandy soil, also persisting on roadsides and cultivated ground.
<i>Indigofera mildbraediana</i>	Gillett	400	T6; Nigeria, Gabon, Congo, Central Africa Republic Sudan, Angola	Semi-woody branching herb.	Scattered tree grassland.
<i>Indigofera rhynchocarpa</i>	Bak.	500 - 2150	T1-8; Central African Republic, Congo, Rwanda, Burundi, Mozambique, Malawi, Zambia, Rhodesia and Angola	Shrub	Brachystegia woodland
<i>Millettia usaramensis</i>	Taub.	10 - 700 (1200)	K7; T1,3,6,8; Z; Mozambique.	Shrub or small tree	Wooded grassland and margins of lowland forest.
<i>Ormocarpum sennooides zanzibaricum</i>	(Willd.) DC.	0 - 600	K7; T3,6,8; Z; non known elsewhere	Shrub or small tree	Scrub on coral rock near shore, in undergrowth of forest or woodland and shady places by streams
<i>Pseudarthria hookeri</i>	Wight & Arn.	0 - 2100	U1-4; K3-7; T1-8; Z; Cameroon, Congo, Burundi, Ethiopia, Sudan, Malawi, Mozambique, Zambia, Rhodesia, Angola, N.E. South Africa; formerly cultivated Mauritius.	Erect woody herb or subshrub	Grassland, grassland with scattered trees and thicket, old cultivations, swamp edges.



Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<i>Rhynchosia congensis pseudobuettneri</i>	Bak.	0 - 45 (780)	T3; apparently endemic to E. Usambaras.	Climber or trailer	Rain forest edges.
<i>Rhynchosia luteola</i>	(Hiern) K. Schum.	300 - 1350	T3, 4, 6-8; Nigeria, Congo, Burundi, Mozambique, Malawi, Rhodesia and Angola.	Robust sticky climber	Evergreen forest margins, Brachystegia, Uapaca woodland, bushland
<i>Rhynchosia malacophylla</i>	(Spreng.) Boj.	0 - 1500	U1; K1-7; T2,3,5; Z; Sudan, Somali Republic, Ehtiopia	Perennial or climbing herb	Deciduous bushland, Acacia scrub, sometimes in plantations.
<i>Teramnus labialis</i>	(L. f.) Spreng.	0 - 1080	U1, 2, 3; K1, 3-7; T2,3,6-8; Z; P; Arabia, Sudan, Mali, Principe, Mozambique, Zambia, Rhodesia, Mauritius, Reunion, Seychelles, Comoro Isl, Madagascar also in the West Indies and Guyana.	Perennial climber	Grassland, bushland, evergreen forest.
<b>GROSSULARIACEAE</b>					
<i>Grevea eggelingii subsp. eggelingii</i>	Milne-Redh.	420 - 600	T3,6;	Shrub	
<b>LAMIACEAE</b>					
<i>Hoslundia opposita</i>	Vahl		U2,3; K1-6; T2-4, 6; Burundi, Somalia, Eritrea, Sudan.	Shrub	
<b>MALVACEAE</b>					
<i>Abutilon mauritanium</i>	(Jacq.) Medik.	750 - 2250	U2,3; K4,7; T3-8; Zaire, Ethiopia	Herb	
<i>Gossypoides kirkii</i>	(Mast.) Hutch.		T6,7,8;	Shrub	
<i>Hibiscus surattensis</i>	L.	1450	U1-4; K3,7; T1,3,4,6,8; Mozambique, Malawi, Zambia, Burundi, Zaire.	Herb	
<b>MELIACEAE</b>					
<i>Pseudobersama mossambicensis</i>	(Sim) Verdc.	60 - 300	K7; T3,6,8; Mozambique and South Africa.	Tree	In understorey at edges of moist lowland forest.
<b>MORACEAE</b>					
<i>Dorstenia hildebrandtii</i>	Engl.	0 - 2100	U2-4; K1-7; T1-7; Zaire, Rwanda, Burundi, Mozambique	Herb	Granitic, coral and limestone outcrops from open forest or woodland, bushland and succulent thickets, often near streams or in local water catchment areas, sometimes in shaded forest sites.
<b>PANDANACEAE</b>					
<i>Pandanus rabaiensis</i>	Rendle	1 - 1400	K7; T3,6,7; Z; P;	Tree	
<b>POACEAE</b>					
<i>Cymbopogon giganteus</i>	Chiov.	0 - 2300	U1,3,4; K2,3; T1,3-8; Z; Tropical Africa	Herb	
<i>Imperata cylindrica</i>	(L.) Raeusch.	0 - 2100	U1-4; K3,5-7; T1,3-8; Z; P; Old World Tropics	Herb	

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<b>POLYGALACEAE</b>					
<i>Polygala sphenoptera</i>	Fresen.	1000 - 2200	U3; K2,3,5-7; T1-8; Zaire, Cameroon, Zimbabwe, Zambia	Herb	
<b>RHAMNACEAE</b>					
<i>Helinus integrifolius</i>	(Lam.) Kuntze	0 - 1700	K1,2,4,6,7; T1-7; Yemen, Socotra Somali Republic, Congo, Angola, Malawi, Rhodesia, Mozambique, South West Africa, South Africa	Woody climber	Thickets in wooded grassland, forest margins, bushland and ry open woody vegetation of all sorts.
<b>RUBIACEAE</b>					
<i>Catunaregam spinosa taylorii</i>	(Thunb.) Tirveng.	100 - 1915	T1-8; Zaire, Mozambique, Malawi, Zambia and Zimbabwe (sub-species range)	shrub or small tree	Brachystegia woodland, open bushland and scrub, grassland with scattered trees, sometimes on rocky ground.
<i>CreMASpora triflora confluens</i>	(Thonn.) K. Schum.	0 - 700 (1225)	K7; T2,3,6-8; Z; P; ?Malawi, also cultivated in India	Shrub or small tree	Evergreen forest, finging forest and bush,t hicket;
<i>Pavetta crebrifolia var. kimbozensis</i>	Hiern	400 - 460 (600)	T6; not known elsewhere.	Shrub or small tree	Forest on limestone
<i>Polysphaeria parvifolia</i>	Hiern	0 - 500	K1,7; T1,3,6,8; Z; P; Sudan, Ethiopia and Somalia	Small tree or shrub	Rather ddry evergreen forest, woodland, coastal bushland and scrub, old sisal plantations, cultivations etc
<b>SAPINDACEAE</b>					
<i>Allophylus africanus griseotomentosus</i>	P. Beauv.	200 - 1800	U1; T1-3,5,6,8; Zaire, Zambia, Malawi, Mozambique and Zimbabwe.	Shrub or tree	Riverine forest, valley thicket
<i>Allophylus rubifolius</i>	(A.Rich.) Engl.	0 - 2250	U1-5; K1-7; T1-8; E. Zaire, Sudan, Ehtiopia and N. Somalia, south to South Africa.	Shrub or small tree	Grassland with scattered trees, rough grassland, thicket edges of cultivation, woodland sometimes riverine
<i>Deinbollia borbonica</i>	Scheff.	0 - 1050	K4,7; T2,3,5-8; Z; P; S. Somalia, Malawi, Mozambique and Comoro Is.	Shrub or small tree	Riverine acaaceaia thorn bush and evegreen thicket. Combretum -Acacia woodland, low evergreen forest on limestone outcrops
<b>SAPOTACEAE</b>					
<i>Manilkara sp.</i>					
<i>Mimusops fruticosa</i>	A. DC.	0 - 750	K7; T3,6,8; Z; P; Mozambique and Rhodesia, also Comoro Is and Madagascar	Shrub or small tree	Lowland dry evergreen forest, riverine forest and coastal evegreen thickets.
<b>SOLANACEAE</b>					
<i>Solanum richardii</i>	Dunal	80 - 1000	T3,6; Z; P	Shrub	

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<i>Solanum schumannianum</i>	Dammer, forma	1450 - 2320	K4,6,7; T2,3,6,7	Small shrub	
STERCULIACEAE					
<i>Dombeya acutangula</i>	Cav.		T2,3,5;	Shrub	
TILIACEAE					
<i>Triumfetta rhomboidea</i>	Jacq.		T1-8;	Shrub	
URTICACEAE					
<i>Laportea lanceolata</i>	(Engl.) Chew	50 - 900	K7; T3,6; ? E. Zaire	Herb	Lowland rain forest, frequently sprawling over rocks in clearings or as forest edge, also on rocky in moist woodland.
VIOLACEAE					
<i>Rinorea squamosa subsp. kaessneri</i>	(Engl.) Grey-Wilson	30 - 450	K7; T6; not known elsewhere	Shrub or small tree	Evergreen lowland and submontane forest.
VITACEAE					
<i>Cyphostemma braunii</i>	(Gilg & Brandt) Descoings	100 - 1950	K7; T3,6; not known elsewhere	Climber	Basically evergreen forest, Podocarpus, Ocotea, etc also secondary bush and scrub in old plantations, rocky areas with small trees and shrubs in rain forest clearings

### 2.10.5 Mammals

Thirteen species of mammal from nine families were recorded in Ruvo Forest Reserve.

**Table 46.** Checklist of the mammals of Ruvo.

Species	Common name	Most recent record
COLOBIDAE		
<i>Colobus angolensis</i>	Angola pied colobus	UMBCP 2000
CERCOPITHECIDAE		
<i>Papio cynocephalus</i>	Yellow baboon	UMBCP 2000
<i>Cercopithecus mitis</i>	Gentle monkey	UMBCP 2000
GALAGONIDAE		
<i>Otolemur garnettii</i>	Small-eared galago	UMBCP 2000
<i>Galagoides zanzibaricus</i>	Zanzibar galago	UMBCP 2000
SORICIDAE		
<i>Crocidura</i> sp.	White-toothed shrew	UMBCP 2000
MACROSCOLIDINAE		
<i>Petrodromus tetradactylus</i>	Four toed elephant shrew	UMBCP 2000
FELIDAE		
<i>Panthera pardus</i>	Leopard	UMBCP 2000
<i>Panthera leo</i>	Lion	UMBCP 2000
PROCAVIDAE		
<i>Dendrohyrax</i> sp.	Tree hyrax	UMBCP 2000
SUIDAE		
<i>Potamochoerus larvatus</i>	Bush pig	UMBCP 2000
BOVIDAE		
<i>Cephalophus monticola</i>	Blue duiker	UMBCP 2000
<i>Cephalophus harveyi</i>	Harvey's duiker	UMBCP 2000

## 2.10.6 Birds

Fifty-eight species of bird from 31 families were recorded in Ruvu Forest Reserve.

**Table 47.** Checklist of the birds of Ruvu.

Species	Common name	Most recent record
<b>SCOPIDAE</b>		
<i>Scopus umbretta</i>	Hamerkop	UMBCP 2000
<b>ACCIPITRIDAE</b>		
<i>Circaetus fasciolatus</i>	Southern banded snake eagle	UMBCP 2000
<i>Terathopius ecaudatus</i>	Bateleur	UMBCP 2000
<i>Polyboroides typus</i>	African harrier hawk	UMBCP 2000
<i>Accipiter tachiro</i>	African goshawk	UMBCP 2000
<i>Stephanoaetus coronatus</i>	African crowned eagle	UMBCP 2000
<b>NUMIDIDAE</b>		
<i>Guttera pucherani</i>	Crested guineafowl	UMBCP 2000
<b>COLUMBIDAE</b>		
<i>Turtur tympanistria</i>	Tambourine dove	UMBCP 2000
<i>Turtur afer</i>	Blue-spotted wood dove	UMBCP 2000
<i>Streptopelia semitorquata</i>	Red-eyed dove	UMBCP 2000
<b>PSITTACIDAE</b>		
<i>Poicephalus robustus</i>	Brown-necked parrot	UMBCP 2000
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's Turaco	UMBCP 2000
<b>STRIGIDAE</b>		
<i>Bubo lacteus</i>	Verreaux's eagle-owl	UMBCP 2000
<i>Strix woodfordii</i>	African wood owl	UMBCP 2000
<b>APODIDAE</b>		
<i>Apus affinis</i>	Little swift	UMBCP 2000
<b>TROGONIDAE</b>		
<i>Apaloderma narina</i>	Narina's trogon	UMBCP 2000
<i>Apaloderma vittatum</i>	Bar-tailed trogon	UMBCP 2000
<b>ALCEDINIDAE</b>		
<i>Alcedo semitorquata</i>	Half-collared kingfisher	UMBCP 2000
<i>Ispidina picta</i>	African pygmy kingfisher	UMBCP 2000
<i>Megaceryle maxima</i>	Giant kingfisher	UMBCP 2000
<b>PHOENICULIDAE</b>		
<i>Phoeniculus purpureus</i>	Green wood-hoopoe	UMBCP 2000
<b>BUCEROTIDAE</b>		
<i>Tockus alboterminatus</i>	Crowned hornbill	UMBCP 2000
<i>Bycanistes bucinator</i>	Trumpeter hornbill	UMBCP 2000
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	UMBCP 2000
<b>CAPITONIDAE</b>		
<i>Stactolaema leucotis</i>	White-eared barbet	UMBCP 2000
<i>Stactolaema olivacea</i>	Green barbet	UMBCP 2000
<i>Pogoniulus simplex</i>	Eastern green tinkerbird	UMBCP 2000
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	UMBCP 2000
<b>INDICATORIDAE</b>		
<i>Indicator variegatus</i>	Scaly-throated honeyguide	UMBCP 2000
<i>Indicator minor</i>	Lesser honeyguide	UMBCP 2000
<b>PICIDAE</b>		
<i>Dendropicos fuscescens</i>	Cardinal woodpecker	UMBCP 2000
<b>EURYLAIMIDAE</b>		
<i>Smithornis capensis</i>	African broadbill	UMBCP 2000
<b>MOTACILLIDAE</b>		
<i>Motacilla aguimp</i>	African pied wagtail	UMBCP 2000

Species	Common name	Most recent record
<b>HIRUNDINIDAE</b>		
<i>Psalidoprocne pristoptera</i>	Black saw-wing	UMBCP 2000
<b>PYCNONOTIDAE</b>		
<i>Andropadus virens</i>	Little greenbul	UMBCP 2000
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	UMBCP 2000
<i>Phyllastrephus fischeri</i>	Fischer's greenbul	UMBCP 2000
<i>Phyllastrephus flavostriatus</i>	Yellow-streaked greenbul	UMBCP 2000
<i>Phyllastrephus debilis</i>	Tiny greenbul	UMBCP 2000
<i>Pycnonotus barbatus</i>	Common bulbul	UMBCP 2000
<b>TURDIDAE</b>		
<i>Pogonocichla stellata</i>	White-starred robin	UMBCP 2000
<i>Cossypha natalensis</i>	Red-capped robin-chat	UMBCP 2000
<i>Alethe fuelleborni</i>	White-chested alethe	UMBCP 2000
<i>Neocossyphus rufus</i>	Red-tailed ant thrush	UMBCP 2000
<i>Zoothera gurneyi</i>	Orange ground thrush	UMBCP 2000
<i>Turdus olivaceus</i>	Olive thrush	UMBCP 2000
<b>SYLVIIDAE</b>		
<i>Macrosphenus kretschmeri</i>	Kretschmer's longbill	UMBCP 2000
<b>MONARCHIDAE</b>		
<i>Erythrocercus holochlorus</i>	Little yellow flycatcher	UMBCP 2000
<i>Trochocercus cyanomelas</i>	Crested flycatcher	UMBCP 2000
<i>Terpsiphone viridis</i>	Paradise flycatcher	UMBCP 2000
<b>PLATYSTEIRIDAE</b>		
<i>Batis mixta</i>	Forest batis	UMBCP 2000
<b>PRIONOPIDAE</b>		
<i>Prionops retzii</i>	Retz's helmet shrike	UMBCP 2000
<b>MALACONOTIDAE</b>		
<i>Malaconotus nigrifrons</i>	Black-fronted bush-shrike	UMBCP 2000
<i>Laniarius aethiopicus</i>	Tropical boubou	UMBCP 2000
<i>Dryoscopus cubla</i>	Black-backed puffback	UMBCP 2000
<b>DICRURIDAE</b>		
<i>Dicrurus adsimilis</i>	Common drongo	UMBCP 2000
<i>Dicrurus ludwigii</i>	Square-tailed drongo	UMBCP 2000
<b>ORIOOLIDAE</b>		
<i>Oriolus larvatus</i>	Black-headed oriole	UMBCP 2000
<i>Oriolus chlorocephalus</i>	Green-headed oriole	UMBCP 2000
<b>CORVIDAE</b>		
<i>Corvus albus</i>	Pied crow	UMBCP 2000
<b>NECTARINIIDAE</b>		
<i>Anthreptes neglectus</i>	Uluguru violet-backed sunbird	UMBCP 2000
<i>Anthreptes collaris</i>	Collared sunbird	UMBCP 2000
<i>Nectarinia olivacea</i>	Olive sunbird	UMBCP 2000
<b>PLOCEIDAE</b>		
<i>Ploceus bicolor</i>	Dark-backed weaver	UMBCP 2000
<b>ESTRILDIDAE</b>		
<i>Mandingoa nitidula</i>	Green-backed twinspot	UMBCP 2000
<i>Hypargos niveoguttatus</i>	Peter's twinspot	UMBCP 2000

### 2.10.7 Reptiles

Thirteen species of reptile from nine families were recorded.

**Table 48.** Checklist of the reptiles of Ruvu.

Species	Common name
<b>TESTUNDINIDAE</b>	

<i>Kinixys belliana</i>	South-eastern hinge-back tortoise	UMBCP 2000
GEKKONIDAE		
<i>Lygodactylus sp.</i>		UMBCP 2000
<i>Lygodactylus williamsi</i>	Turquoise dwarf gecko	UMBCP 2000
<i>Cnemaspis africana</i>	Usambara forest gecko	UMBCP 2000
<i>Hemidactylus platycephalus</i>	Baobab gecko	UMBCP 2000
CHAMAELEONIDAE		
<i>Chamaeleo dilepis</i>	Common flap-necked chameleon	UMBCP 2000
<i>Rhampholeon brevicaudatus</i>	Bearded pigmy chameleon	UMBCP 2000
SCINCIDAE		
<i>Mabuya varia</i>	Variable skink	UMBCP 2000
VARANIDAE		
<i>Varanus niloticus</i>	Nile monitor	UMBCP 2000
BOIDAE		
<i>Python sebae</i>	Southern African python	UMBCP 2000
VIPERIDAE		
<i>Bitis arietans</i>	Puff adder	UMBCP 2000
COLUBRIDAE		
<i>Psammophis subtaeniatus orientalis</i>	Eastern stripe-bellied sand snake	UMBCP 2000
CROCODYLIDAE		
<i>Crocodylus niloticus</i>	Nile crocodile	UMBCP 2000

### 2.10.8 Amphibians

Eight species of amphibians from four families were recorded.

**Table 49.** Checklist of the amphibians of Ruvu.

Species	Common name	
ARTHROLEPTIDAE		
<i>Arthroleptis stenodactylus</i>	Shovel-footed squeaker	UMBCP 2000
<i>Arthroleptis xenodactyloides</i>		UMBCP 2000
BUFONIDAE		
<i>Bufo maculatus</i>		UMBCP 2000
<i>Nectophrynoides tornieri</i>		UMMCP 2000
MICROHYLIDAE		
<i>Mertensophryne micranotis</i>		UMBCP 2000
RANIDAE		
<i>Phrynobatrachus ?ukingensis</i>		UMBCP 2000
<i>Ptychadena anchietae</i>		UMBCP 2000
<i>Afrana angolensis</i>	Common river frog	UMBCP 2000

### 2.10.9 Biodiversity

The forests are of the Eastern Arc and Coastal forest type and so are rich in species of restricted distribution. An Eastern Arc endemic is *Pycnocomma macrantha*. *Rawsonia reticulata* occurs here below its normal altitudinal range. The presence of species more typical of the coastal forests such as the frog *Mertensophryne micranotis* and the bird *Erythrocerus holochlorus* suggest that Ruvu Forest Reserve may be an important link in the chain of coastal lowland forests.

### 2.10.10 Catchment values

The area protects the banks of the Ruvu river, and is part of the catchment. The Ruvu River supplies Dar es Salaam with water.

#### 2.10.11 Human impacts



Ruby mining is the the most serious disturbance in the forest and the reserve is one of the most important localities for this gemstone in Tanzania. Licensed mining causes much damage, but is restricted to a small area. Unlicensed mining is carried out in many places in the reserve causing damage to the habitat by removing the soil cover. Miners have also established camps on the banks of the Ruvu River where they can pan for gold.

Encroachment by small scale farming and fire also causes damage near the villages of Kibungo and Kibangile.

Duiker and bush pig are being hunted.

**Figure 15.** Miners dig large pits to extract rubies and some semi-precious stones.

#### 2.10.12 Management proposals

Proper boundary planting and regular patrolling is essential. Due to the gemstone mining business much stronger guarding is necessary.

More cooperation is needed between the Department of Mines and the Forest and Beekeeping Divison as, according to the local Forest Officer, licenses to extract gems are being issued without consultation with the FBD.

#### 2.10.13 Literature

Lovett, J.C. & T. Pócs (1993). Assessment of the condition of the Catchment Forest Reserves, a botanical appraisal. Catchment Forestry Report 93.3, Dar es Salaam. 300 pp.

## 2.11 Shikurufumi Catchment Forest Reserve

Morogoro District, Morogoro Region

Morogoro Division

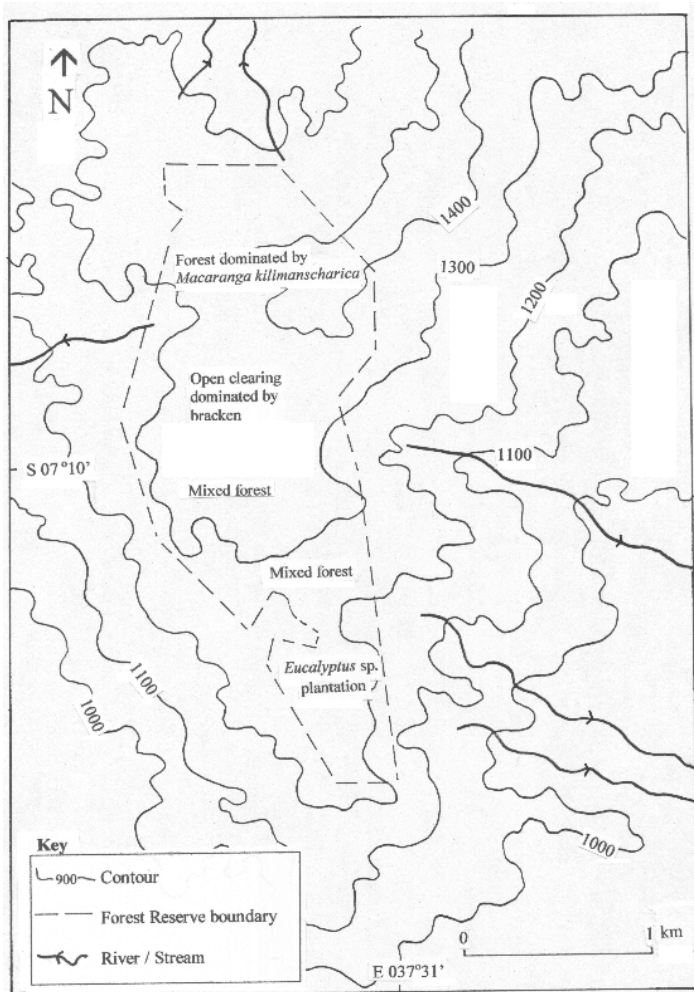
Year of establishment	:	1948 or 1937 see cap 132
Declaration	:	GN 216 of 1948, GN 128 of 1937
Variation order	:	None
Border map	:	Jb 44 (1:3960) 1937, traced 1956
Topographical map	:	201/1
Gazetted area	:	260 ha
Gazetted boundary length	:	9.1 km

### 2.11.1 Location

07° 09' - 07° 11' S 037° 31' E

20 km from Mgeta. Access is from Mgeta through Langali, Nyandira, Kibuko, Luale to Kidege. The road to the reserve is in poor condition. The altitude of Shikurufumi ranges from 1200 m asl to 1500 m asl. The reserve slopes gently towards the South. There is a small stream in the east of the reserve.

**Figure 16.** Sketch map of Shikurifumi Forest Reserve





### 8.11.2 Soils

Sandy brown loams over gneissic basement rocks.

### 8.11.3 Climate

Oceanic rainfall with oceanic temperatures. Nearest rainfall station: Kibuko Coffee Plantation. Estimated rainfall: 1500 mm/year. Dry season: June - Oct. Temperature range: 22°C max (Dec.), 17°C min (July).

### 8.11.4 Vegetation

The reserve is mostly covered by submontane forest, part of which appears to be old secondary growth. Based on the 1955 aerial photographs of the area, the secondary forest has been present in the area for at least 50 years. The edges of the forest are scrubby regeneration and are probably influenced by fire. In the centre of the reserve is a clearing which may be edaphic or the site of an old village and is now influenced by fire. On the southern edge there is a *Eucalyptus* sp. plantation.

Submontane forest: Old secondary areas on the top of the ridge have a fairly open canopy 15-20 m high dominated by *Macaranga kilimandscharica* with: *Alangium chinense*, *Albizia gummifera*, *Bridelia micrantha*, *Cussonia spicata*, *Harungana madascariensis*, *Polyscias fulva*, *Trema orientalis*. *Aframomum* sp. dominates the herb layer. On more sheltered slopes, more mature areas of forest have a closed canopy 25-30 m high with: *Afrosersalisia cerasifera*, *Entandrophragma excelsum*, *Macaranga capensis*, *Myrianthus holstii*, *Newtonia buchananii*, *Odyendea zimmermannii*, *Parinari excelsa*, *Strombosia scheffleri*, *Trichoscypha madagascariensis*, *Trilepisium madagascariensis*. On the forest edge, scrubby regeneration includes: *Bersama abyssinica*, *Catha edulis*, *Cussonia spicata*, *Macaranga kilimandscharica*. The clearing in the forest is covered by bracken with occasional *Agauria salicifolia* and *Myrica salicifolia* trees.

Of the 43 specimens collected in Shikurifumi 35 have been identified to species level (Table 50). These include 31 species from 20 families.

Plant species, sub-species and varieties recorded in Shikurifumi F.R. with ranges restricted to FTEA regions T3, K7, T6, T8, Z and P (i.e. the FTEA regions that include the Eastern Arc and Coastal Forests) include

**Table 50.** Annotated list of plant species collected in Shikurifumi F.R.

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
ACANTHACEAE					
<i>Asystasia</i> sp. nov. aff. <i>A. leptostachya</i>	Lindau (Polhill 4640, etc.)				
<i>Brillantaisia cicatricosa</i>	Lindau	1700 - 2200	U1,2; T3,5,6; Burundi	Shrub	
<i>Chlamydostachya spectabilis</i>	Mildbr.	1300 - 1900	T6	Shrub	

<b>Taxon</b>	<b>Author species</b>	<b>Altitudinal range</b>	<b>Distribution</b>	<b>Life form</b>	<b>Habitat</b>
<i>Isoglossa lactea</i>	Lindau ex Engl.	250 - 800 (-1700)	T2,3,6,7	Shrub	
<i>Justicia asystasioides</i>	(Lindau) M.E.Steiner	550 - 1250	x	Shrub	
<i>Mimulopsis arborescens</i>	C.B. Clarke		K3,4; T6	Shrub	
<b>ANACARDIACEAE</b>					
<i>Sorindeia madagascariensis</i>	Thouars ex DC.	1 - 1830	K4,7; T2,3,5-8; P;Z; Malawi, Mozambique, Mascarene Islands, Madagascar	Evergreen tree	Riverine, coastal and upland forest, often in wet or seasonally flooded places.
<b>ARALIACEAE</b>					
<i>Polyscias fulva</i>	(Hiern) Harms	1180 - 2160	U2-4; K5; T1-4,6,7; W. Africa, Malawi, Zambia, Zimbabwe, Angola, Democratic Republic of Congo, Burundi	Tree	Upland and lowland rain-forest, riverine forest, also upland grassland.
<b>ASTERACEAE</b>					
<i>Gynura scandens</i>	O. Hoffm	1000 - 2100	U2,4; K3,4,6,7; T3,6,7;	Herb	
<b>BEGONIACEAE</b>					
<i>Begonia oxyloba</i>	Welw.	1100	K5; T3,7; Burundi, Zaire, W. Africa	Herb	
<b>CLUSIACEAE</b>					
<i>Hypericum quartinianum</i>	A. Rich.	1150 - 2250	U1,2; K2,3,7; T4,6-8; Eth, Mal, Zai, Zam, Moz	Shrub	Rocky places, gulleys and river banks in upland grassland or deciduous woodland
<b>CONNARACEAE</b>					
<i>Jaundeia pinnata</i>	(P. Beauv.) Schellenb.	0 - 2500	U2,4; K4,7; T1-3,6,7; W. Africa, Sudan, Zimbabwe, Angola	Shrub	
<b>CUCURBITACEAE</b>					
<i>Raphidiocystis chrysocoma</i>	(Schumach.) C. Jeffrey	300 - 1370	U2,4; T3,6; west Africa from Guinea Republic eastwards to Togo Republic.	Climber	Lowland rain-forest
<b>DRACAENACEAE</b>					
<i>Dracaena fragrans</i>	(L.) Ker-Gawl		U2-4; K5; T1,3,4,6; Zaire, S. Africa		
<b>EUPHORBIACEAE</b>					
<i>Shirakiopsis elliptica</i>	(Hochst.) Esser			Tree	
<b>FABACEAE</b>					
<i>Desmodium repandum</i>	(Vahl) DC.	1000 - 3000	U1-4; K1-7; T1-8; tropical and subtropical Africa, Madagascar, Mascarene Is., India and Malesia	Perennial herb	Occasional in shady grassland and marginal areas of cultivated land, but more often one of the dominant components of shaded places in dry evergreen forest or rain forest or at the

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
					forest margin.
FLACOURTIACEAE					
<i>Flacourtia indica</i>	(Burm. f.) Merr.	0 - 2400	U1,3,4; K2-5, 7; T1-8; Z; widespread in tropical and subtropical Africa, Madagascar, Mascarenes and Seychelles, also in Asia and Malesia, sometimes cultivated for its edibl fruits.	Shrub or tree	Woodland, wooded grassland and bushland. Often riparian.
LORANTHACEAE					
<i>Englerina inaequilatera</i>	(Engl.) Gilli	(700-) 1400-2650	T4-8; easternmost Zambia, Malawi and Mozambique.	Shrub	Montane forest, often abundant at edges, extending down to drier forest on Rondo Plateau and into forest-woodland transition zones, on a wide variety of hosts.
MALVACEAE					
<i>Pavonia urens</i>	Cav.	850 - 2350	K3,6; T7; Ethiopia	Shrub	
MELASTOMATACEAE					
<i>Gravesia pulchra var. glandulosa</i>	(Gilg) Wickens	1000 - 2000	T6; not known elsewhere.	Woody herb or shrub	Upland rain-forest
MORACEAE					
<i>Ficus sur</i>	Forssk	0 - 2300	U1-4; K1,3-7; T1-8; Z; P; extending to Yemen, Cape Verde Isl. Angola and South Africa.	Tree	Forest, riverine, wooded grassland, often left in cleared places.
MYRICACEAE					
<i>Morella salicifolia kilimandscharica</i>	(A. Rich.) Verdc. & Polhill	(800-) 1100 - 2800	K4-7, T2,3,5-8, Zambia, Malawi	Shrub or small tree	Upland rain-forest, Agauria - Xymalos etc, particularly near upper and lower limits, extending into upland grassland and bushland, exposed rocky outcrops and the ericaceous zones of upland moor.
RUBIACEAE					
<i>Canthium oligocarpum captum</i>	Hiern	1350 - 2000	T3,6,7; Malawi and Mozambique (subsp range)	Shrub or tree	Forest
<i>Mussaenda arcuata</i>	Lam. ex Poir.	700 - 1830	U1-4; K3,5,?7; T1,3,4,6- 8; throughout tropical Africa (excluding Somalia) as far south as Angola and Zimbabwe; Madagascar, Mauritius, and Reunion.	Shrub or climber	Grassland, bushland, open or closed forest, evergreen rain-forest.
<i>Oxyanthus goetzei</i>	K. Schum.	610 - 1650	K4,7; T6,3; not known	Shrub	Forest

Taxon	Author species	Altitudinal range	Distribution	Life form	Habitat
<i>keniensis</i>			elsewhere.		
<i>Rubia cordifolia subsp conotricha</i>	(Gand.) Verdc.	1140 - 2650	U1-4; K1-6; T1-8; Zaire, Sudan, Somali Republic, Mozambique; Malawi, Zambia, Rhodesia, Angola and South Africa ( mostly Natal and Transvaal)	Herb	Mostly at forest edges, in clearings and thickets or less often in denser forest, open grassland and bushland also in scrubland and rocky gullies
<i>Rytigynia cf. Xanthotricha</i>	(K. Schum.) Verdc. fortasse sp. nov.				
<i>Rytigynia eickii</i>	(K. Schumm.& K. Krause) Bullock	950 - 1830	K7; T3,6; not known elsewhere	Shrub or small tree	Open bushland in granite areas, submontane forest
<i>Tarenna pavettoides Sim subsp. Affinis</i>	(Harv.)		T3,6,7,8; P; Mozambique, Malawi, Zimbabwe	Shrub or small tree	
<b>SAPINDACEAE</b>					
<i>Allophylus congolanus</i>	Gilg	500 - 1150	T4,6-8; Zaire, Zambia and Malawi	Shrub or small tree	grassland with scattered trees or shrubs, lakeside woodland and dry bushland in limestone gorges
<i>Allophylus ferrugineus stipitatus</i>	Taub.	1000 - 2100	T 2,4,6,7; not known elsewhere.	Tree or shrub	Steep forested ravines, forest edges
<b>SCROPHULARIACEAE</b>					
<i>Halleria lucida</i>	L.	1000 - 2500	U1; K1,3-6; T1,2,6,6; Ethiopia	Tree	

### 2.11.5 Catchment values

Shikurufumi stream originates in the reserve and flows through Lukungule village to Mbakana river through Kikeo mission. On the northeast side water is taken from the forest via irrigation channels to Kododo Kitongoji Bomo.

### 2.11.6 Mammals

Eight species of mammal from seven families were recorded.

**Table 51.** Checklist of the mammals of Shikurufumi.

Species	Common name	Most recent record
<b>COLOBIDAE</b>		
<i>Colobus angolensis</i>	Angola pied colobus	UMBCP 2000
<b>CERCOPITHECIDAE</b>		
<i>Cercopithecus aethiops</i>	Savannah monkey	UMBCP 2000
<b>GALAGONIDAE</b>		
<i>Otolemur garnettii</i>	Small-eared galago	UMBCP 2000
<i>Galagoides zanzibaricus</i>	Zanzibar galago	UMBCP 2000

Species	Common name	Most recent record
SORICIDAE		
<i>Myosorex geata</i>	Mouse shrew	UMBCP 2000
NANDININAE		
<i>Nandinia binotata</i>	African palm civet	UMBCP 2000
SUIDAE		
<i>Potamochoerus larvatus</i>	Bush pig	UMBCP 2000
BOVIDAE		
<i>Cephalophus harveyi</i>	Harvey's duiker	UMBCP 2000

### 2.11.7 Reptiles

Three species of reptile from three families were recorded.

**Table 52.** Checklist of the reptiles of Shikurufumi.

Species	Common name	Most recent record
CHAMAELEONIDAE		
<i>Rhampholeon brevicaudatus</i>	Bearded pigmy chameleon	UMBCP 2000
SCINCIDAE		
<i>Mabuya</i> sp.		UMBCP 2000
COLUBRIDAE		
<i>Crotaphopeltis tornieri</i>	Tornier's cat snake	UMBCP 2000

### 2.11.8 Amphibians

Four species of amphibian from four families were recorded. Some specimens have not yet been identified.

**Table 53.** Checklist of the amphibians of Shikurufumi.

Species	Common name	Most recent record
ARTHROLEPTIDAE		
<i>Arthroleptis xenodactyloides</i>		UMBCP 2000
<i>Arthroleptis ?xenodactylus</i>		UMBCP 2000
HYPEROLIDAE		
<i>Hyperolius puncticulatus</i>		UMBCP 2000
MICROHYLIDAE		
<i>Callulina kreffti</i>		UMBCP 2000
RANIDAE		
<i>Phrynobatrachus</i> sp. B.		UMBCP 2000

### 2.11.9 Biodiversity

The forest is of the Eastern Arc type and has various species of restricted distribution.

#### 2.11.10 Human impacts

On the ridge tops the forest appears to be in an old secondary successional stage, and the central clearing in the reserve may be the result of former inhabitation. Local people do not remember cultivation or habitation within the reserve and disturbance may date back several hundred years.

The road to Kikeo mission (the Kibuko to Mkinha road as mentioned in the schedule) passes through the reserve, but is no longer used by motor vehicles. Formerly there was a mica mine and small farm on the southern edge of the reserve and this area is still cultivated by local people. There are many eucalyptus trees around the old mine

buildings.

There is some cutting for firewood and building poles but this is not extensive. *Eucalyptus* sp. poles are taken for building from regeneration in the *Eucalyptus* sp. plantation. Medicine is taken from the reserve, notably bark from *Entandrophragma excelsum* and *Myrica salicifolia* trees.

#### 2.11.11 Management proposals

No encroachment was seen or reported and the boundary has been cleared and planted close to Kidege. Fire control is still needed on the forest edge and in the central clearing. Old secondary areas could be planted with species of commercial value, notably *Ocotea usambarensis*. In more mature forest enrichment planting with *Entandrophragma excelsum* should be considered. Firewood and building pole woodlots should be established on the boundary. As part of the important Uluguru mountain catchment, no exploitation should be permitted.

#### 2.11.12 Literature

Lovett, J.C. & T. Pócs (1993). Assessment of the condition of the Catchment Forest Reserves, a botanical appraisal. Catchment Forestry Report 93.3, Dar es Salaam. 300 pp.

## 2.12 *Uluguru North Catchment Forest Reserve*

Morogoro District, Morogoro Region	
Morogoro Division	
Year of establishment	:1906 enlarged in 1964 (Tongoni River)
Declaration	:
Variation order	:GN 219 of 23/6/61, GN 578 of 22/11/63
Border map	:Jb 536 (1:50 000) 1986 (the survey for this map must have been much earlier as the data is in feet) Another map was produced in 1964
Topographical maps	:183/3, 201/1
Gazetted area	:8356 ha
Gazetted boundary length	: 68 km

### 2.12.1 Location

6° 51' - 7° 01' S 37° 37' - 37° 45' E

6 km from Morogoro. Access is from the Morogoro to Morningside road on the western side, and Tegetero on the eastern side. The reserve covers the steep summit ridge and easterly slopes of the northern half of Uluguru Mountains between Morogoro town and the Mgeta - Bunduki depression, within an altitudinal range of 1000 and 2340 m. From northeast to southwest the main summits are: Lupanga (2138m), Kinazi (2150m), Bondwa (2120m), Nziwane (2270m), Magari (2340m), Miwa (1900m), Mnyanza (2140m) and Kifuru (2010m).

### 2.12.2 Soils

Acidic lithosols and ferralitic red, yellow and brown latosols have developed over Precambrian granulite, gneiss and migmatite rocks.

### 2.12.3 Climate

Oceanic rainfall with oceanic temperatures. Nearest rainfall stations: Kinole Primary School, Morningside Farm, Tegetero Mission. Estimated rainfall: 1200-3100 mm/year on the western slopes, 2900-4000 mm/year on the eastern slopes. Dry season: Not marked. Temperatures: 22°C max (Dec.), 17°C min (July) at lower altitudes. Higher altitudes are considerably colder although no records are available.

### 2.12.4 Vegetation

With the exception of rock outcrops, the reserve is almost entirely covered in moist forest. Submontane forest occurs on the eastern slopes between 800 and 1500 m above sea level, with the best stands above Bagilo and Tegetero villages. On the western slopes this forest type is restricted to valley bottoms near to the lower edge of the Forest Reserve. Montane forest occurs between 1500 and 1900 m altitude. Upper montane forest occurs above 1900 m altitude on wetter slopes and ridges in the cloud belt, with stunted elfin forest on the highest ridges. Landslips occur.

Submontane forest: Canopy 30-50 m tall with: *Albizia gummifera*, *Allanblackia stuhlmannii*, *Aningeria adolfi-friedericii*, *Anthocleista grandiflora*, *Cephalosphaera usambarensis*, *Cylicomorpha parviflora*, *Funtumia africana*, *Myrianthus holstii*, *Sapium ellipticum*, *Syzygium guineense* subsp. *afromontanum*. Trees and shrubs include:

*Chlamydstachya spectabilis*, *Lagynias pallidiflora*, *Micrococca holstii*, *Psychotria* spp. and *Pavetta* spp., *Pseuderanthemum campylosiphon*, *Memecylon cognauxii* and *M. myrtilloides*, *Mesogyne insignis*, *Micrococca holstii*, *Oxyanthus speciosus*, *Peddiea fischeri* and *P. subcordata*. *Commelinaceae* subshrubs include: *Palisota orientalis*, *Pollia condensata* and *P. bracteata*. Herbs include: the Zingiberaceae, *Aframomum* spp. and *Renealmia engleri* with broad leaved grasses such as *Leptaspis cocleata*. On shady cliffs the large *Antrophyum mannianum* fern is typical, and a common canopy epiphyte is the giant nest fern, *Asplenium nidus*. In drier areas on the lower edge of the forest, usually below 1000 m, a semi-evergreen submontane forest type also occurs, dominated by *Albizia gummifera* and *Milicia excelsa*.

Montane forest: The canopy is much less complex than in the previous type and usually consists of a single layer of 15-30 m tall trees. The dominant species are: *Bridelia brideliifolia*, *Cornus volkensis*, *Cussonia spicata*, *Ficalhoa laurifolia*, *Ocotea usambarensis*, *Podocarpus latifolius*, *Syzygium guineense* subsp. *afromontanum* and *Zenkerella capparidacea*. Shrubs include: *Chassalia parviflora*, *C. violacea*, *Lasiodiscus usambarensis*, *Galineria coffeoides*, *Erythrococca usambarica*, *Euphorbia usambarica*, *Memecylon myrtilloides*, *Mostuea brunonis*, *Psychotria* spp. and *Pavetta* spp., and along streamlets large stands of the treefern *Cyathea manniana* occur. There are many epiphytic ferns and even in the ground layer ferns are the dominants, for example: *Asplenium hypomelas*, *Blotiella stipitata*, *Ctenitis lanuginosa*, *Diplazium pseudoporrectum*. On drier slopes and ridges a drier type of montane forests occurs with *Olea mildbraedii* and *Cussonia lukwangulensis* in the canopy, and *Blechnum ivohibense* and *P. punctulatum* and *Gleichenia* species in the herb layer.

Upper montane forest: Canopy 15-20 m tall with: *Allanblackia ulugurensis*, *Balthasaria schliebenii*, *Podocarpus latifolius*, *P. ensiculus*, *Rapanea melanophloeos*, *Rauwolfia volkensis*, *Schefflera myriantha* and *S. barteri*. Epiphytes include the endemic orchids *Stolzia* spp. The trees and forest floor are thickly covered by bryophytes, which contribute to the catchment value. Shrubs include: *Lasianthus* spp. of which 8 are endemic, and the tree ferns, *Cyathea manniana*, the subendemic *C. pumila* and the endemic *C. fadenii* and *C. schliebenii*. On the mossy ground several endemic *Impatiens* spp. (like *I. uluguruensis*), *Cinnobotrys oreophila*, endemic *Linnaeopsis* spp. and *Streptocarpus* spp. (like *S. bullatus*) are typical. Elfin forests cover the highest summits and sharp ridges above 2100 m (but at windy, misty habitat sometimes down to about 1800 m altitude), where the shallow soil is completely leached and peaty. The canopy is 2-6 m tall with: *Agauria salicifolia*, *Allanblackia uluguruensis*, *Balthasaria schliebenii*, *Cussonia lukwangulensis*, *Garcinia volkensis*, *Podocarpus ensiculus*, *P. latifolius*, *Syzygium cordatum*, *Ternstroemia polypetala*, *Polyscias stuhlmannii* and *Lobelia lukwangulensis*. The trees form a tight, dense canopy, with masses of bryophytes and tiny, endemic orchids, like *Tridactyle brevifolia*. Dwarf shrubs, like the monotypic endemic *Dionychastrum schliebenii* (on Magari peak), the endemic *Stapfiella ulugurica* and *Streptocarpus hirsutissimus* (on Lupanga peak), also occur in this habitat. Bamboo (*Sinarundinaria alpina*) thickets occur in the elfin forest on the sharp north ridge of Magari peak.



### 2.12.5 Mammals

Fifty-nine species of mammal from 25 families have been described as being from the 'Ulugurus'. Unfortunately data is not available to clarify which part of the Ulugurus however as Ulugurus generally means Uluguru North and South, it is assumed that those species described by Swynnerton and Hayman in 1950 and by Stanley in 1983 as being in the 'Ulugurus' are present in Uluguru North.

**Table 54. Checklist of the mammals of Uluguru North.**

Species	Common name	Range	Habitat	Most recent record
<b>COLOBIDAE</b>				
<i>Colobus angolensis</i>	Angola pied colobus	Widespread	FF	UMBCP 2000
<b>CERCOPITHECIDAE</b>				
<i>Cercopithecus mitis</i>	Gentle monkey	Widespread	F	UMBCP 2000
<b>GALAGONIDAE</b>				
<i>Otolemur garnettii</i>	Small-eared galago	Coastal forests and Eastern Arc	F	UMBCP 2000
<i>Galagoides orinus</i>	Usambara galago	Eastern Arc	FF	UMBCP 2000
<b>PTEROPODIDAE</b>				
<i>Rousettus lanosus</i>	Mountain fruit bat	Widespread	F	Swynnerton and Hayman 1950
<b>NYCTERIDAE</b>				
<i>Nycteris thebaica</i>	Slit-faced bat	Widespread		Swynnerton and Hayman 1950
<i>Nycteris hispida</i>	Slit-faced bat	Widespread		Swynnerton and Hayman 1950
<b>RHINOLOPHINAE</b>				
<i>Rhinolophus landeri lobatus</i>	Horseshoe bat	Widespread		Swynnerton and Hayman 1950
<b>HIPPOSIDERIDAE</b>				
<i>Hipposideros caffer caffer</i>	Leaf-nosed bat	Widespread		Swynnerton and Hayman 1950
<b>VESPERTILIONIDAE</b>				
<i>Myotis welwitschii venustus</i>	Hairy bat	Widespread		Swynnerton and Hayman 1950
<i>Kerivoula africana</i>	Woolly bat	Lowland E. Arc and Coastal Forests		Swynnerton and Hayman 1950
<i>Chalinolobus argentatus</i>	Butterfly bat	Widespread		Swynnerton and Hayman 1950
<i>Pipistrellus kuhlii fuscatus</i>	Pipistrelle	Widespread		Swynnerton and Hayman 1950
<i>Pipistrellus nanus nanus</i>	Pipistrelle	Widespread		Swynnerton and Hayman 1950
<i>Scotophilus viridis viridis</i>	House bats	Widespread		Swynnerton and Hayman 1950
<i>Miniopterus schreibersi</i>	Long-fingered bats	Widespread		Swynnerton and Hayman 1950
<b>CHRYSOCHLORIDAE</b>				
<i>Chrysochloris stuhlmanni tropicalis</i>	Stuhlmann's golden mole	Sub-species endemic to Ulugurus		Swynnerton and Hayman 1950
<b>SORICIDAE</b>				
<i>Crocidura hirta</i>	White-toothed shrew	Widespread		Swynnerton and Hayman 1950
<i>Crocidura monax</i>	White-toothed shrew	Eastern Arc, Kilimanjaro and one other site.		Stanley et al. 1998
<i>Crocidura olivieri</i>	White-toothed shrew	Widespread		Stanley et al. 1998
<i>Crocidura telfordi</i>	White-toothed shrew	Uluguru	FF	Stanley et al. 1998
<i>Myosorex geata</i>	Mouse shrew	Uluguru	FF	Swynnerton and Hayman 1950
<i>Sylvisorex howelli</i>	Climbing shrew	Usambara and Uluguru	FF	Stanley et al. 1998
<i>Sylvisorex megalura</i>	Climbing shrew	Widespread		Stanley et al. 1998
<b>MACROSCOLIDINAE</b>				
<i>Petrodromus tetradactylus</i>	Four toed elephant shrew	Widespread	F	Swynnerton and Hayman 1950

<b>Species</b>	<b>Common name</b>	<b>Range</b>	<b>Habitat</b>	<b>Most recent record</b>
<b>RHYNCHONCYONINAE</b>				
<i>Rhynchocyon petersi</i>	Zanj elephant shrew	S. Pare, Usambara, Uluguru, Nguru?, Coastal Forests	F	Swynnerton and Hayman 1950
<b>SCIURIDAE</b>				
<i>Paraxerus lucifer</i>	Tanganyika mountain squirrel	Widespread	FF	Swynnerton and Hayman 1950
<i>Paraxerus palliatus</i>	Red-bellied coast squirrel	Widespread	F	Swynnerton and Hayman 1950
<i>Paraxerus ochraceus</i>	Ochre bush squirrel	Widespread	F	Swynnerton and Hayman 1950
<b>ANOMALURIDAE</b>				
<i>Anomalurus derbianus</i>	Lord Derby's anomalure	Widespread	F	Swynnerton and Hayman 1950
<b>DENDROMURINAE</b>				
<i>Dendromus mesomelas</i>	Climbing mouse	Widespread	O	Swynnerton and Hayman 1950
<b>CRICETOMYINAE</b>				
<i>Cricetomys gambianus</i>	Giant pouched rat	Widespread	F	Swynnerton and Hayman 1950
<b>OTOMYINAE</b>				
<i>Otomys denti</i>	Groove-toothed rat	Widespread	O	Swynnerton and Hayman 1950
<b>MURIDAE</b>				
<i>Lophuromys sikapusi</i>	Brush-furred mouse	Widespread	F	Swynnerton and Hayman 1950
<i>Lophuromys flavopunctatus</i>	Brush-furred mouse	Widespread	F	Stanley et al. 1998
<i>Praomys sp.</i>	Soft-furred rat	Widespread	F	Swynnerton and Hayman 1950
<i>Mus minutoides</i>	Common mouse	Widespread		Swynnerton and Hayman 1950
<i>Dasymys incommutus</i>	Shaggy swamp rat	Widespread	O	Swynnerton and Hayman 1950
<i>Lemniscomys sp.</i>	Zebra mouse	Widespread	O	Swynnerton and Hayman 1950
<i>Pelomys fallax</i>	Creek rat	Widespread	O	Swynnerton and Hayman 1950
<b>MUSTELIDAE</b>				
<i>Aonyx capensis</i>	African clawless otter	Widespread	F	Swynnerton and Hayman 1950
<b>VIVERRIDAE</b>				
<i>Genetta sp.</i>	Blotched genet	Widespread	F	Swynnerton and Hayman 1950
<i>Civettictis civetta</i>	African civet	Widespread	F	Swynnerton and Hayman 1950
<i>Leptailurus serval</i>	Serval cat	Widespread	O	Swynnerton and Hayman 1950
<b>NANDININAE</b>				
<i>Nandinia binotata</i>	African palm civet	Widespread	F	Swynnerton and Hayman 1950
<b>FELIDAE</b>				
<i>Panthera pardus</i>	Leopard	Widespread	F	Swynnerton and Hayman 1950
<b>PROCAVIDAE</b>				
<i>Dendrohyrax validus</i>	Tree hyrax		F	Swynnerton and Hayman 1950
<b>SUIDAE</b>				
<i>Potamochoerus larvatus</i>	Bush pig	Widespread	F	Swynnerton and Hayman 1950
<b>BOVIDAE</b>				
<i>Tragelaphus scriptus</i>	Bushbuck	Widespread	F	Swynnerton and Hayman 1950
<i>Cephalophus monticola</i>	Blue duiker	Widespread	FF	Swynnerton and Hayman 1950
<i>Cephalophus harveyi</i>	Harvey's duiker	Widespread	FF	Swynnerton and Hayman 1950
<i>Cephalophus spadix</i>	Abbot's duiker	Uluguru, Udzungwa, Usambara? Rungwe and Kilimanjaro	FF	Swynnerton and Hayman 1950
<i>Neotragus moschatus</i>	Suni	Widespread	F	Swynnerton and Hayman 1950

### 2.12.6 Birds

Svendsen and Hansen (1995) recorded 60 species from 28 families during their survey in 1993.

**Table 55.** Checklist of the birds of Uluguru North.

Species	Common name	Most recent record
<b>ACCIPITRIDAE</b>		
<i>Accipiter tachiro</i>	African goshawk	Svendsen and Hansen 1995
<i>Buteo oreophilus</i>	Mountain buzzard	Svendsen and Hansen 1995
<i>Stephanoaetus coronatus</i>	African crowned eagle	Svendsen and Hansen 1995
<b>COLUMBIDAE</b>		
<i>Turtur tympanistria</i>	Tambourine dove	Svendsen and Hansen 1995
<i>Columba delegorguei</i>	Eastern bronze-naped pigeon	Svendsen and Hansen 1995
<i>Columba arquatrix</i>	Olive pigeon	Svendsen and Hansen 1995
<i>Aplopelia larvata</i>	Lemon dove	Svendsen and Hansen 1995
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's turaco	Svendsen and Hansen 1995
<b>CUCULIDAE</b>		
<i>Cercococcyx montanus</i>	Barred long-tailed cuckoo	Svendsen and Hansen 1995
<b>STRIGIDAE</b>		
<i>Bubo vosseleri</i>	Usambara eagle-owl	UMBCP 2000
<i>Strix woodfordii</i>	African wood owl	Svendsen and Hansen 1995
<b>APODIDAE</b>		
<i>Schoutedenapus myoptilus</i>	Scarce swift	Svendsen and Hansen 1995
<b>TROGONIDAE</b>		
<i>Apaloderma vittatum</i>	Bar-tailed trogon	Svendsen and Hansen 1995
<b>BUCEROTIDAE</b>		
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	Svendsen and Hansen 1995
<b>CAPITONIDAE</b>		
<i>Stactolaema olivacea</i>	Green barbet	Svendsen and Hansen 1995
<i>Pogoniulus leucomystax</i>	Moustached green tinkerbird	Svendsen and Hansen 1995
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	Svendsen and Hansen 1995
<b>INDICATORIDAE</b>		
<i>Indicator variegatus</i>	Scaly-throated honeyguide	Svendsen and Hansen 1995
<b>PICIDAE</b>		
<i>Dendropicos griseocephalus</i>	Olive woodpecker	Svendsen and Hansen 1995
<b>EURYLAIMIDAE</b>		
<i>Smithornis capensis</i>	African broadbill	Svendsen and Hansen 1995
<b>PYCNONOTIDAE</b>		
<i>Andropadus virens</i>	Little greenbul	Svendsen and Hansen 1995
<i>Andropadus masukuensis</i>	Shelley's greenbul	Svendsen and Hansen 1995
<i>Andropadus nigriceps</i>	Mountain greenbul	Svendsen and Hansen 1995
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	Svendsen and Hansen 1995
<i>Phyllastrephus flavostriatus</i>	Yellow-streaked greenbul	Svendsen and Hansen 1995
<b>TIMALIIDAE</b>		
<i>Pseudoalcippe abyssinica</i>	African hill babbler	Svendsen and Hansen 1995
<i>Modulatrix stictigula</i>	Spot-throat	Svendsen and Hansen 1995
<b>TURDIDAE</b>		
<i>Pogonocichla stellata</i>	White-starred robin	Svendsen and Hansen 1995
<i>Sheppardia sharpei</i>	Sharpe's akalat	Svendsen and Hansen 1995
<i>Cossypha anomala</i>	Olive-flanked robin-chat	Svendsen and Hansen 1995
<i>Cossypha natalensis</i>	Red-capped robin-chat	Svendsen and Hansen 1995
<i>Alethe fuelleborni</i>	White-chested alethe	Svendsen and Hansen 1995
<i>Zoothera gurneyi</i>	Orange ground thrush	Svendsen and Hansen 1995
<i>Turdus olivaceus</i>	Olive thrush	Svendsen and Hansen 1995

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>MUSCICAPIDAE</b>		
<i>Muscicapa adusta</i>	African dusky flycatcher	Svendsen and Hansen 1995
<b>SYLVIIDAE</b>		
<i>Camaroptera brachyura</i>	Grey-backed camaroptera	Svendsen and Hansen 1995
<i>Phylloscopus winifredae</i>	Mrs Moreau's warbler	Svendsen and Hansen 1995
<i>Phylloscopus ruficapillus</i>	Yellow-throated woodland warbler	Svendsen and Hansen 1995
<i>Bradypterus lopezi</i>	Evergreen forest warbler	Svendsen and Hansen 1995
<i>Apalis melanocephala</i>	Black-headed apalis	Svendsen and Hansen 1995
<i>Apalis chariessa</i>	White-winged apalis	Svendsen and Hansen 1995
<i>Apalis thoracica</i>	Bar-throated apalis	Svendsen and Hansen 1995
<i>Apalis chapini</i>	Chapins apalis	Svendsen and Hansen 1995
<i>Orthotomus metopias</i>	African tailorbird	Svendsen and Hansen 1995
<b>ZOSTEROPIDAE</b>		
<i>Zosterops senegalensis</i>	Yellow white-eye	Svendsen and Hansen 1995
<b>MONARCHIDAE</b>		
<i>Trochocercus albonotatus</i>	White-tailed crested flycatcher	Svendsen and Hansen 1995
<i>Terpsiphone viridis</i>	Paradise flycatcher	Svendsen and Hansen 1995
<b>PLATYSTEIRIDAE</b>		
<i>Batis mixta</i>	Forest batis	Svendsen and Hansen 1995
<b>MALACONOTIDAE</b>		
<i>Malaconotus multicolor</i>	Many-coloured bush-shrike	Svendsen and Hansen 1995
<i>Malaconotus alius</i>	Uluguru bush-shrike	Svendsen and Hansen 1995
<i>Laniarius fuelleborni</i>	Fulleborn's black boubou	Svendsen and Hansen 1995
<b>CAMPEPHAGIDAE</b>		
<i>Coracina caesia</i>	Grey cuckoo-shrike	Svendsen and Hansen 1995
<b>DICRURIDAE</b>		
<i>Dicrurus ludwigii</i>	Square-tailed drongo	Svendsen and Hansen 1995
<b>ORIOLOIDAE</b>		
<i>Oriolus chlorocephalus</i>	Green-headed oriole	Svendsen and Hansen 1995
<b>STURNIDAE</b>		
<i>Poeoptera kenricki</i>	Kenrick's starling	Svendsen and Hansen 1995
<i>Onychognathus walleri</i>	Waller's starling	Svendsen and Hansen 1995
<b>NECTARINIIDAE</b>		
<i>Nectarinia olivacea</i>	Olive sunbird	Svendsen and Hansen 1995
<i>Nectarinia loveridgei</i>	Loveridge's sunbird	Svendsen and Hansen 1995
<b>PLOCEIDAE</b>		
<i>Ploceus bicolor</i>	Dark-backed weaver	Svendsen and Hansen 1995
<b>ESTRILDIDAE</b>		
<i>Cryptospiza reichenovii</i>	Red-faced crimsonwing	Svendsen and Hansen 1995

### 2.12.7 Reptiles

Four species of reptiles from three families have been recorded in Uluguru North. The real total is probably higher but intensive surveys have not been conducted in Uluguru North. Other species which are likely to be present include *Bradypodion oxyrhinum*, *Bradypodion fishcheri uluguruensis* and *Chamaeleo werneri*.

**Table 56.** Partial checklist of the reptiles of Uluguru North.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>CHAMAELEONIDAE</b>		
<i>Rhampholeon brevicaudatus</i>	Bearded pigmy chameleon	Mariaux 2000
<i>Rhampholeon uluguruensis</i>	Uluguru pigmy chameleon	Howell 1985
<b>VIPERIDAE</b>		
<i>Atheris ceratophorus</i>	Horned bush-viper	UMBCP 2000

## COLUBRIDAE

<i>Crotaphopeltis tornieri</i>	Tornier's cat snake	Howell 1985
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## 2.12.8 Amphibians

Seventeen species of amphibian from six families have been recorded in Uluguru North.

**Table 57.** Checklist of the amphibians of Uluguru North.

Species	Common name	Most recent record
<b>ARTHROLEPTIDAE</b>		
<i>Arthroleptis affinis</i>		UMBCP 2000
<i>Arthroleptis xenodactylus</i>		Channing 2000
<b>BUFONIDAE</b>		
<i>Nectophrynooides viviparus</i>		UMBCP 2000
<i>Nectophrynooides minutus</i>		Howell 1993
<i>Nectophrynooides cryptus</i>		Barbour and Loveridge 1928
<i>Nectophrynooides</i> sp. nov.		Howell 199?
<b>HYPEROLIIDAE</b>		
<i>Hyperolius puncticulatus</i>		Channing 2000
<i>Hyperolius spinigularis</i>		Channing 2000
<i>Hyperolius mitchelli</i>		Mariaux 2000
<i>Afrixalus fornasinii</i>	Greater leaf-folding frog	Channing 2000
<i>Leptopelis flavomaculatus</i>		Channing 2000
<i>Leptopelis parkeri</i>		Mariaux 2000
<b>MICROHYLIDAE</b>		
<i>Probreviceps macrodactylus</i>		Channing 2000
<b>RANIDAE</b>		
<i>Arthroleptides martiensseni</i>		Channing 2000
<i>Phrynobatrachus natalensis</i>		Channing 2000
<i>Phrynobatrachus acridoides</i>		UMBCP 2000
<i>Phrynobatrachus uzungwensis</i>		Channing 2000
<i>Rana</i> sp.		Mariaux 2000
<b>CAECILIIDAE</b>		
<i>Scolecormorphus uluguruensis</i>		UMBCP 2000

## 2.12.9 Biodiversity

The forests are of the Eastern Arc type and so are rich in species of restricted distribution. More than 40 endemic species of woody plant are recorded from the Uluguru mountains. The genera of *Impatiens*, *Lasianthus*, *Linnaeopsis* and *Stolzia* contain many endemics and monotypic endemics and near endemics are; *Chlamydstachya spectabilis*, *Dionychastrum schliebenii*, *Sooia macrantha* and *Urogentias ulugurica*. The Uluguru mountains have three endemic or subendemic giant Lobelia species: *L. morogoroensis* in submontane forest, *L. longisepala* in montane forest and *L. lukwangulensis* in upper montane forest. There are many subendemic species which also occur in the Usambara or Nguru mountains.

The fauna is also rich endemics including the Uluguru bush shrike *Malaconotus alius*, Loveridge's sunbird *Nectarinia loveridgei*, the chameleon *Rhampholeon uluguruensis* and the caecilian *Scolecormorphus uluguruensis*. The 2000 surveys collected the first confirmed specimen of the horned bush-viper *Atheris ceratophorus* from the Uluguru Mountains.

#### 2.12.10 Catchment values

The catchment value is very high as the area has one of the highest rainfalls in Tanzania without a marked dry season. On eastern side the reserve is part of the Ruvu river catchment, and supplies Dar es Salaam with water. On the western side it supplies Morogoro town and villages on the mountain slopes.

#### 2.12.11 Human impacts

The area adjacent to the reserve is intensively cultivated. Although the forest boundaries are well marked and seemingly intact, many encroachments occur and illegal logging takes place. Pole collecting for building purposes has resulted in most regeneration being removed from areas near the edge of the reserve. Heavy rains have caused serious landslides several times in the area. Fires lit at the end of the dry season cause serious damage every year in the Forest Reserve. The steep slopes result in the fires spreading rapidly in dry bush and grasslands neighbouring the forest. The areas most affected are the slopes of Lupanga above Morogoro town.

#### 2.12.12 Management proposals

The number of forest guards should be increased and proper patrolling of the forest is essential. To meet the local need for building poles and firewood, agroforestry should be encouraged and plantations establishing on the slopes. This should also increase catchment capacity and control erosion.

#### 2.12.13 Literature

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### 2.13 *Uluguru South Catchment Forest Reserve*

Morogoro District, Morogoro Region

Morogoro Division

Year of establishment	:	1906?
Declaration	:	GN 219 of 23/6/61
Variation order	:	None
Border map	:	Jb 579, Jb 585 (1:50 000) 1963
Topographical maps	:	201/1
Gazetted area	:	17 293 ha, 40 594 ha on Jb 585
Gazetted boundary length	:	36.6 km

#### 2.13.1 Location

7° 01' - 7° 12' S 37° 36' - 37° 45' E

26 km from Morogoro, 5 km from Mgeta. Access is from Mgeta via Tchenzema or Bunduki. The east of the reserve can be reached via Koleru-Kasanga. The reserve covers the southern half of the Uluguru mountains from about 1200 m upwards on the east and from 1800 m on the western slopes to the summits of Makumbaku (2420m), Kimhandu (2634m) and Lukwangule Peak (2638m). The 20 km<sup>2</sup> Lukwangule Plateau lies between two parallel north - south ridges at an altitude of over 2300 m.

#### 2.13.2 Soils

A wide range of acidic lithosols and ferralitic red, yellow and brown latosols have developed on Precambrian granulite, gneiss and migmatite rocks. A large area of the Lukwangule Plateau is covered by peat deposits.

#### 2.13.3 Climate

Nearest rainfall stations: Bunduki Kibungo mission, Tchenzema Mission. Estimated rainfall: 2500-4000 mm/year on the eastern slopes and summit to 2000 mm/ year on the western slopes. Dry season: On the eastern slopes there is no marked dry season, on the western slopes there is a dry season of from June - July. Temperature: 20°C max (Dec.), 15°C min (July) at lower altitudes. On the Lukwangule plateau frosts are common on clear nights during the cool season (measured down to -7°C).

#### 2.13.4 Vegetation

The eastern and western slopes are covered by moist forest, which surrounds the upland grassland, swamps and forest patches of the Lukwangule plateau. Montane forest occurs from 1500-2400 m, and upper montane forest above 2000 m. Bamboo thickets cover large areas in the upper Mgeta valley and on Kimhandu summit, usually above 2000 m, but also as low as 1600 m in the Mgeta River Valley above Hululu Falls. Landslips occur.

Montane forest. No data, but presumably similar to Uluguru North montane forest.

Upper montane forest: Canopy 10-15 m tall. Trees on the eastern side include: *Bersama abyssinica*, *Cassipourea malosana*, *Cornus volkensii*, *Cussonia lukwangulensis*, *C. spicata*, *Dombeya torrida*, *Draceana afromontana*, *Garcinia volkensii*, *Halleria lucida*,

*Podocarpus latifolius*, *Rapanea melanophloeos*, *Maesa lanceolata*, *Mystroxydon aethiopicum*, *Nuxia congesta*, *Ocotea usambarensis*, *Polyscias stuhlmannii* and *Xymalos monospora*. Bamboo thickets form dense stands of *Sinarundinaria alpina* 12-15 m tall and 15 cm diameter, with the commonest species in the ground flora being *Selaginella kraussiana*.

Grasslands and tree clumps: Grasslands on the Lukwangule plateau consisting of *Panicum lukwangulense* and *Andropogon thystinus* with scattered trees of *Agauria saliciflora*, *Adenocarpus mannii*, *Myrica salicifolia* and *Berberis* sp. are thought to have replaced upper montane forest following fire. Forest patches contain the trees: *Apodytes dimidiata*, *Cussonia lukwangulensis*, *Ochna oxyphylla*, *Olea capensis*, *Pittosporum goetzei*, *Syzygium cordatum*, *S. parvulum*; and the giant herb *Lobelia lukwangulensis*. At the Ruvu river springs, peat bogs formed by *Sphagnum* spp, *Eriocaulon schimperii* and *Pycreus nigricans* occur. In boggy places afroalpine species, such as *Ranunculus oreophytus* and *Alchemilla johnstonii* occur.

#### 2.13.5 Catchment values

The catchment value of the reserve is extremely high. It covers one of the highest rainfall areas in Tanzania, feeding the Ruvu River which supplies Dar es Salaam. The locally important Mgeta River also originates in the reserve.

#### 2.13.6 Mammals

Fifty-nine species of mammal from 25 families have been described as being from the 'Ulugurus'. Unfortunately data is not available to clarify which part of the Ulugurus however as Ulugurus generally means Uluguru North and South, it is assumed that those species described by Swynnerton and Hayman in 1950 and by Stanely in 1983 as being in the 'Ulugurus' are present in Uluguru South.

**Table 58.** Checklist of the mammals of Uluguru South.

Species	Common name	Range	Most recent record
<b>COLOBIDAE</b>			
<i>Colobus angolensis</i>	Angola pied colobus	Widespread	UMBCP 2000
<b>CERCOPITHECIDAE</b>			
<i>Cercopithecus mitis</i>	Gentle monkey	Widespread	UMBCP 2000
<b>GALAGONIDAE</b>			
<i>Otolemur garnettii</i>	Small-eared galago	Coastal forests and Eastern Arc	UMBCP 2000
<i>Galagoides orinus</i>	Usambara galago	Eastern Arc	UMBCP 2000
<b>PTEROPODIDAE</b>			
<i>Rousettus lanosus</i>	Mountain fruit bat	Widespread	Swynnerton and Hayman 1950
<b>NYCTERIDAE</b>			
<i>Nycteris thebaica</i>	Slit-faced bat	Widespread	Swynnerton and Hayman 1950
<i>Nycteris hispida</i>	Slit-faced bat	Widespread	Swynnerton and Hayman 1950
<b>RHINOLOPHINAE</b>			
<i>Rhinolophus landeri lobatus</i>	Horseshoe bat	Widespread	Swynnerton and Hayman 1950
<b>HIPPOSIDERIDAE</b>			
<i>Hipposideros caffer caffer</i>	Leaf-nosed bat	Widespread	Swynnerton and Hayman 1950
<b>VESPERTILIONIDAE</b>			
<i>Myotis welwitschii venustus</i>	Hairy bat	Widespread	Swynnerton and Hayman 1950



<b>Species</b>	<b>Common name</b>	<b>Range</b>	<b>Most recent record</b>
<i>Kerivoula africana</i>	Woolly bat	Lowland E. Arc and Coastal Forests	Swynnerton and Hayman 1950
<i>Chalinolobus argentatus</i>	Butterfly bat	Widespread	Swynnerton and Hayman 1950
<i>Pipistrellus kuhlii fuscatus</i>	Pipistrelle	Widespread	Swynnerton and Hayman 1950
<i>Pipistrellus nanus nanus</i>	Pipistrelle	Widespread	Swynnerton and Hayman 1950
<i>Scotophilus viridis viridis</i>	House bats	Widespread	Swynnerton and Hayman 1950
<i>Miniopterus schreibersi</i>	Long-fingered bats	Widespread	Swynnerton and Hayman 1950
<b>CHRYSOCHLORIDAE</b>			
<i>Chrysochloris stuhlmanni tropicalis</i>	Stuhlmann's golden mole	Sub-species endemic to Ulugurus	Swynnerton and Hayman 1950
<b>SORICIDAE</b>			
<i>Crocidura hirta</i>	White-toothed shrew	Widespread	Swynnerton and Hayman 1950
<i>Crocidura monax</i>	White-toothed shrew	Eastern Arc, Kilimanjaro and one other site.	Stanley et al. 1998
<i>Crocidura olivieri</i>	White-toothed shrew	Widespread	Stanley et al. 1998
<i>Crocidura telfordi</i>	White-toothed shrew	Uluguru	Stanley et al. 1998
<i>Myosorex geata</i>	Mouse shrew	Uluguru	Swynnerton and Hayman 1950
<i>Sylvisorex howelli</i>	Climbing shrew	Usambara and Uluguru	Stanley et al. 1998
<i>Sylvisorex megalura</i>	Climbing shrew	Widespread	Stanley et al. 1998
<b>MACROSCOLIDINAE</b>			
<i>Petrodromus tetradactylus</i>	Four toed elephant shrew	Widespread	Swynnerton and Hayman 1950
<b>RHYNCHONCYONINAE</b>			
<i>Rhynchocyon petersi</i>	Zanj elephant shrew	S. Pare, Usambara, Uluguru, Nguru?, Coastal Forests	Swynnerton and Hayman 1950
<b>SCIURIDAE</b>			
<i>Paraxerus</i>	Tanganyika mountain squirrel	Widespread	Swynnerton and Hayman 1950
<i>Paraxerus palliatus</i>	Red-bellied coast squirrel	Widespread	Swynnerton and Hayman 1950
<i>Paraxerus ochraceus</i>	Ochre bush squirrel	Widespread	Swynnerton and Hayman 1950
<b>ANOMALURIDAE</b>			
<i>Anomalurus derbianus</i>	Lord Derby's anomalure	Widespread	Swynnerton and Hayman 1950
<b>DENDROMURINAE</b>			
<i>Dendromus mesomelas</i>	Climbing mouse	Widespread	Swynnerton and Hayman 1950
<b>CRICETOMYINAE</b>			
<i>Cricetomys gambianus</i>	Giant pouched rat	Widespread	Swynnerton and Hayman 1950
<b>OTOMYINAE</b>			
<i>Otomys denti</i>	Groove-toothed rat	Widespread	Swynnerton and Hayman 1950
<b>MURIDAE</b>			
<i>Lophuromys sikapusi</i>	Brush-furred mouse	Widespread	Swynnerton and Hayman 1950
<i>Lophuromys flavopunctatus</i>	Brush-furred mouse	Widespread	Stanley et al. 1998
<i>Praomys sp.</i>	Soft-furred rat	Widespread	Swynnerton and Hayman 1950
<i>Mastomys sp.</i>	Multimammate rat	Widespread	Swynnerton and Hayman 1950
<i>Mus minutoides</i>	Common mouse	Widespread	Swynnerton and Hayman 1950
<i>Dasymys incommutus</i>	Shaggy swamp rat	Widespread	Swynnerton and Hayman 1950
<i>Lemniscomys sp.</i>	Zebra mouse	Widespread	Swynnerton and Hayman 1950
<i>Pelomys fallax</i>	Creek rat	Widespread	Swynnerton and Hayman 1950
<b>MUSTELIDAE</b>			
<i>Aonyx capensis</i>	African clawless otter	Widespread	Swynnerton and Hayman 1950
<b>VIVERRIDAE</b>			

<b>Species</b>	<b>Common name</b>	<b>Range</b>	<b>Most recent record</b>
<i>Genetta tigrina</i>	Blotched genet	Widespread	Swynnerton and Hayman 1950
<i>Civettictis civetta</i>	African civet	Widespread	Swynnerton and Hayman 1950
<i>Leptailurus serval</i>	Serval cat	Widespread	Swynnerton and Hayman 1950
<b>NANDININAE</b>			
<i>Nandinia binotata</i>	African palm civet	Widespread	Swynnerton and Hayman 1950
<b>FELIDAE</b>			
<i>Panthera pardus</i>	Leopard	Widespread	UMBCP 2000
<b>PROCAVIDAE</b>			
<i>Dendrohyrax validus</i>	Tree hyrax		Swynnerton and Hayman 1950
<b>SUIDAE</b>			
<i>Potamochoerus larvatus</i>	Bush pig	Widespread	Swynnerton and Hayman 1950
<b>BOVIDAE</b>			
<i>Tragelaphus scriptus</i>	Bushbuck	Widespread	Swynnerton and Hayman 1950
<i>Cephalophus monticola</i>	Blue duiker	Widespread	Swynnerton and Hayman 1950
<i>Cephalophus harveyi</i>	Harvey's duiker	Widespread	UMBCP 2000
<i>Cephalophus spadix</i>	Abbot's duiker	Udzungwa, Usambara? Uluguru Rungwe and Kilimanjaro	UMBCP 2000
<i>Neotragus moschatus</i>	Suni	Widespread	Swynnerton and Hayman 1950

### 2.13.7 Birds

Svendsen and Hansen (1995) recorded 58 species of bird from 27 families during their survey in 1993 some of which were re-recorded by the UMBCP surveys in 2000.

**Table 59.** Checklist of the of birds of Uluguru South.

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<b>ACCIPITRIDAE</b>		
<i>Accipiter tachiro</i>	African goshawk	Svendsen and Hansen 1995
<i>Buteo oreophilus</i>	Mountain buzzard	Svendsen and Hansen 1995
<i>Stephanoaetus coronatus</i>	African crowned eagle	Svendsen and Hansen 1995
<b>COLUMBIDAE</b>		
<i>Turtur tympanistria</i>	Tambourine dove	Svendsen and Hansen 1995
<i>Columba delegorguei</i>	Eastern bronze-naped pigeon	Svendsen and Hansen 1995
<i>Columba arquatrix</i>	Olive pigeon	Svendsen and Hansen 1995
<i>Aplopelia larvata</i>	Lemon dove	Svendsen and Hansen 1995
<b>MUSOPHAGIDAE</b>		
<i>Tauraco livingstonii</i>	Livingstone's Turaco	Svendsen and Hansen 1995
<b>CUCULIDAE</b>		
<i>Cercococcyx montanus</i>	Barred long-tailed cuckoo	Svendsen and Hansen 1995
<b>STRIGIDAE</b>		
<i>Strix woodfordii</i>	African wood owl	Svendsen and Hansen 1995
<b>APODIDAE</b>		
<i>Schoutedenapus myoptilus</i>	Scarce swift	Svendsen and Hansen 1995
<b>TROGONIDAE</b>		
<i>Apaloderma vittatum</i>	Bar-tailed trogon	Svendsen and Hansen 1995
<b>BUCEROTIDAE</b>		
<i>Bycanistes brevis</i>	Silvery-cheeked hornbill	Svendsen and Hansen 1995
<b>CAPITONIDAE</b>		
<i>Stactolaema olivacea</i>	Green barbet	Svendsen and Hansen 1995
<i>Pogoniulus leucomystax</i>	Moustached green tinkerbird	Svendsen and Hansen 1995
<i>Pogoniulus bilineatus</i>	Yellow-rumped tinkerbird	Svendsen and Hansen 1995
<b>PICIDAE</b>		

<b>Species</b>	<b>Common name</b>	<b>Most recent record</b>
<i>Dendropicos griseocephalus</i>	Olive woodpecker	Svendsen and Hansen 1995
<b>EURYLAIMIDAE</b>		
<i>Smithornis capensis</i>	African broadbill	Svendsen and Hansen 1995
<b>PYCNONOTIDAE</b>		
<i>Andropadus virens</i>	Little greenbul	Svendsen and Hansen 1995
<i>Andropadus masukuensis</i>	Shelley's greenbul	Svendsen and Hansen 1995
<i>Andropadus nigriceps</i>	Mountain greenbul	Svendsen and Hansen 1995
<i>Andropadus olivaceiceps</i>	Striped-cheeked greenbul	Svendsen and Hansen 1995
<i>Phyllastrephus cabanisi</i>	Cabanis's greenbul	Svendsen and Hansen 1995
<b>TIMALIIDAE</b>		
<i>Pseudoalcippe abyssinica</i>	African hill babbler	Svendsen and Hansen 1995
<i>Modulatrix stictigula</i>	Spot-throat	UMBCP 2000
<b>TURDIDAE</b>		
<i>Pogonocichla stellata</i>	White-starred robin	Svendsen and Hansen 1995
<i>Sheppardia sharpei</i>	Sharpe's akalat	Svendsen and Hansen 1995
<i>Cossypha anomala</i>	Olive-flanked robin-chat	Svendsen and Hansen 1995
<i>Cossypha natalensis</i>	Red-capped robin-chat	Svendsen and Hansen 1995
<i>Alethe fuelleborni</i>	White-chested alethe	Svendsen and Hansen 1995
<i>Zoothera gurneyi</i>	Orange ground thrush	Svendsen and Hansen 1995
<i>Turdus olivaceus</i>	Olive thrush	Svendsen and Hansen 1995
<b>MUSCICAPIDAE</b>		
<i>Muscicapa adusta</i>	African dusky flycatcher	Svendsen and Hansen 1995
<i>Muscicapa caerulescens</i>	Ashy flycatcher	Svendsen and Hansen 1995
<b>SYLVIIDAE</b>		
<i>Camaroptera brachyura</i>	Grey-backed camaroptera	Svendsen and Hansen 1995
<i>Phylloscopus winifredae</i>	Mrs Moreau's warbler	Svendsen and Hansen 1995
<i>Phylloscopus umbrovirens</i>	Brown woodland warbler	Svendsen and Hansen 1995
<i>Phylloscopus ruficapillus</i>	Yellow-throated woodland warbler	Svendsen and Hansen 1995
<i>Bradypterus lopezi</i>	Evergreen forest warbler	Svendsen and Hansen 1995
<i>Apalis thoracica</i>	Bar-throated apalis	UMBCP 2000
<i>Apalis chapini</i>	Chapins apalis	Svendsen and Hansen 1995
<i>Orthotomus metopias</i>	African tailorbird	Svendsen and Hansen 1995
<b>ZOSTEROPIDAE</b>		
<i>Zosterops senegalensis</i>	Yellow white-eye	Svendsen and Hansen 1995
<b>MONARCHIDAE</b>		
<i>Trochocercus albonotatus</i>	White-tailed crested flycatcher	Svendsen and Hansen 1995
<i>Terpsiphone viridis</i>	Paradise flycatcher	Svendsen and Hansen 1995
<b>PLATYSTEIRIDAE</b>		
<i>Batis mixta</i>	Forest batis	Svendsen and Hansen 1995
<b>MALACONOTIDAE</b>		
<i>Malaconotus multicolor</i>	Many-coloured bush-shrike	Svendsen and Hansen 1995
<i>Laniarius fuelleborni</i>	Fulleborn's black boubou	Svendsen and Hansen 1995
<b>CAMPEPHAGIDAE</b>		
<i>Coracina caesia</i>	Grey cuckoo-shrike	Svendsen and Hansen 1995
<b>DICRURIDAE</b>		
<i>Dicrurus ludwigii</i>	Square-tailed drongo	Svendsen and Hansen 1995
<b>ORIOOLIDAE</b>		
<i>Oriolus chlorocephalus</i>	Green-headed oriole	Svendsen and Hansen 1995
<b>STURNIDAE</b>		
<i>Poeoptera kenricki</i>	Kenrick's starling	Svendsen and Hansen 1995
<i>Onychognathus walleri</i>	Waller's starling	Svendsen and Hansen 1995
<b>NECTARINIIDAE</b>		
<i>Nectarinia olivacea</i>	Olive sunbird	Svendsen and Hansen 1995
<i>Nectarinia loveridgei</i>	Loveridge's sunbird	UMBCP 2000
<b>ESTRILDIDAE</b>		

Species	Common name	Most recent record
<i>Cryptospiza salvadorii</i>	Abyssinian crimsonwing	Svendsen and Hansen 1995
<i>Cryptospiza reichenovii</i>	Red-faced crimsonwing	Svendsen and Hansen 1995
FRINGILLIDAE		
<i>Linurgus olivaceus</i>	Oriole finch	Svendsen and Hansen 1995

### 2.13.8 Reptiles

Three reptile species, all chameleons were recorded.

**Table 60.** Partial checklist of the reptiles of Uluguru South.

Species	Common name	Most recent record
CHAMAELEONIDAE		
<i>Bradypodion fischeri uluguruensis</i>	Uluguru two-horned chameleon	UMBCP 2000
<i>Bradypodion oxyrhinum</i>	Uluguru one-horned chameleon	UMBCP 2000
<i>Chamaeleo werneri</i>	Werner's three-horned chameleon	UMBCP 2000

### 2.13.9 Amphibians

Nine species of amphibian from six families have been recorded from Uluguru South over the last ten years.

**Table 61.** Partial checklist of the amphibians of Uluguru South.

Species	Common name	Most recent record
ARTHROLEPTIDAE		
<i>Arthroleptis xenochirus</i>		UMBCP 2000
<i>Arthroleptis affinis</i>		UMBCP 2000
BUFONIDAE		
<i>Nectophrynoides cryptus</i>		Howell 1993
<i>Nectophrynoides viviparus</i>		UMBCP 2000
HYPEROLIDAE		
<i>Hyperolius puncticulatus</i>		UMBCP 2000
<i>Leptopelis parkeri</i>		UMBCP 2000
MICROHYLIDAE		
<i>Probreviceps uluguruensis</i>		UMBCP 2000
RANIDAE		
<i>Strongylopus fasciatus fuelleborni</i>		UMBCP 2000
CAECILIIDAE		
<i>Scolecophorus ?uluguruensis</i>		UMBCP 2000

### 2.13.10 Biodiversity

The forests are of the Eastern Arc type and so are rich in species of restricted distribution. The Uluguru mountain forests contain more than 40 endemic woody species, and they are particularly rich in endemic species of the genera; *Impatiens*, *Lasianthus*, *Linnaeopsis* and *Stolzia*. Monotypic endemics are; *Dionychastrum schliebenii* and *Sooia macrantha*. *Moraea callista* occurs on the Lukwangule plateau. The wetter eastern part of the reserve is not known botanically and is likely to contain many species of restricted distribution.

### 2.13.11 Human impacts

The reserve is surrounded by cultivation. The Mgeta valley is an important agriculture area producing vegetables which supply Morogoro and Dar es Salaam, the slopes above Tchenzema are cultivated up to 2000 m altitude. Building poles are intensively collected

in areas adjacent to cultivation. Encroachment is common and logging is carried out. Heavy rainfall on steep deforested slopes has resulted in serious landslips.

Local people are hunting *Cercopithecus mitis*, *Colobus angolensis* and *Cephalophus spadix*. There is also trade in chameleons which are sold to a mluguru trader in Dar es Salaam.

#### 2.13.12 Literature

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