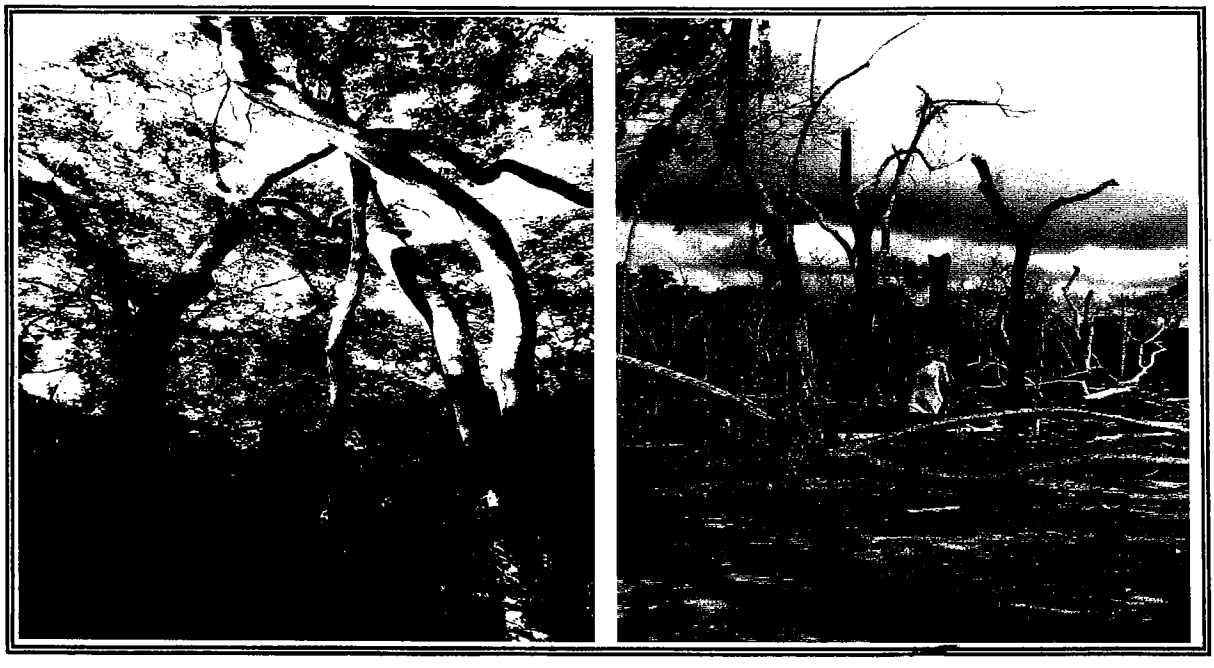
THE SOCIETY FOR ENVIRONMENTAL EXPLORATION
AND THE UNIVERSITY OF DAR ES SALAAM

FRONTIER-TANZANIA COASTAL FORESTS WORKSHOP

Coastal Forests of Eastern Africa: Biodiversity and Conservation

Edited by Neil D Burgess and Catharine Muir

SEPTEMBER 1994



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PROCEEDINGS OF THE COASTAL FORESTS OF EASTERN AFRICA WORKSHOP

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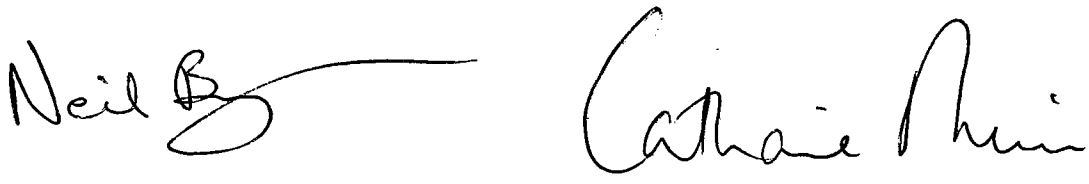
PREFACE

This document has been compiled using the information generated by the Coastal Forests of eastern Africa Workshop held between the 9-11 August 1993 at the University of Dar es Salaam in Tanzania, and from draft chapters produced for a book on the Coastal Forests being edited by Neil Burgess and Philip Clarke. A draft of the text for these Proceedings was reviewed by Prof. Kim Howell of the Zoology Department at the University of Dar es Salaam, Prof. Juma Kapuya of the Botany Department of the University of Dar es Salaam, Dr. Donald Broadley of the Natural History Museum of Zimbabwe (Bulawayo), Dr. Alan Rodgers of the GEF Biodiversity Conservation Project for East Africa, Stan Davies of the Wildlife Conservation Society of Tanzania, Ann Robertson of the Coast Forest Survey in Kenya, Thomas Lehmburg of the Zoological Museum in Denmark, and Philip Clarke and Eibleis Fanning of the Society for Environmental Exploration.

The editors of this Proceedings, are aware that there are certainly errors in the information provided. We apologise for these, but would be delighted to hear from anyone who can provide clarification or further data to resolve such problems. We believe that these Proceedings are only the first stage in gathering together the information that will enable the significance of these forests for biodiversity to be understood accurately.



Neil Burgess and Catharine Muir, Cambridge, September 1994

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SUMMARY

Until recently the Coastal Forests of eastern Africa were poorly known. However in the past decade research work in Somalia, Kenya, Tanzania and Zimbabwe has added greatly to our knowledge of these forests. This research has provided information on forest location, status, biological significance and the threats faced by these forests.

Research programmes which have collected most of the recent information on the Coastal Forests are:

a) *the Somalia Research Programme.* This project investigated the Coastal Forests of the Jubba river in Somalia in 1986. It was a collaboration between the Somali Ecological Society and University College London. Instability in Somalia has prevented further work since the late 1980s, and hence no more recent data are available.

b) *the Coast Forest Survey in Kenya.* This project of the National Museums of Kenya has investigated the plants of the Kenyan Coastal Forests for over 5 years. Most of the work has been supported by the World Wide Fund for Nature (WWF).

c) *the Kenyan Indigenous Forest Conservation Programme (KIFCON) / National Museums of Kenya Ornithology Department survey of birds and other fauna.* This project was initiated in 1991 and has conducted intensive studies in Arabuko-Sokoke forest, and undertaken more rapid appraisals of some other Coastal Forests in southern Kenya. This work was funded by the British Overseas Development Administration (ODA).

d) *the Frontier-Tanzania Coastal Forest Research Programme.* This project is a collaboration between the Faculty of Science at the University of Dar es Salaam in Tanzania and the Society for Environmental Exploration, based in the UK. The project started in 1989 and over the past five years has completed detailed studies of 25 forest sites and undertaken preliminary visits to about 50 further sites. Work is currently underway in the East Usambara lowland forests. All work by the Frontier project is funded by the Society for Environmental Exploration, largely from contributions from voluntary European research assistants.

e) *the Tanzanian/Danish BirdLife International Coastal Forest Ornithological Survey Project.* This work began in 1988 with the aim of surveying the birds of Coastal Forest sites, mostly in south-eastern Tanzania. Three expeditions have visited the Coastal Forests, co-ordinated by the Danish and Tanzanian sections of the International Council for Bird Preservation (now BirdLife International).

The above research programmes have made the Coastal Forests of eastern Africa one of the better-known tropical forest areas in Africa. However, there is still much to learn. For some sites basic survey work, such as visiting the site and describing the area of Coastal Forest, is still required. The continual discovery of new species in these forests also demonstrates that further work is needed before the flora and fauna are fully described and their distributions are known. Conservation priorities in the Coastal Forests have not been well described by these programmes, largely because the projects have operated in isolation of each other.

The Workshop

The Coastal Forests of Eastern Africa Workshop was held in August 1993 at the University of Dar es Salaam in Tanzania. It was organised by the Frontier-Tanzania Coastal Forest Research Programme, with support from the Royal Society for the Protection of Birds in the UK and the NORAD-funded Catchment Forestry Project in Tanzania. The Workshop was organised to pool data from three sources:

1. the research programmes outlined above,
2. the Forestry and Wildlife Departments in the countries possessing Coastal Forests,

3. academics and conservationists from around the world.

The Workshop aimed to summarise these data into a form that would be more widely accessible to a larger number of people in eastern Africa, and hence assist the conservation of these forests.

Status

There is probably under 4000 km^2 of Coastal Forest left in eastern Africa. Countries with Coastal Forest are Mozambique (approx 1790km^2), Tanzania (approx 800km^2), Kenya (approx 550km^2), Malawi (16km^2), Zimbabwe (3km^2) and Somalia (approx 1km^2). The Coastal Forest block is highly fragmented into over 200 separate forest patches. Most of these forests are less than 25km^2 in area, and the majority fall within areas under the control of the government departments of Forestry and Wildlife. Over 70% of all Coastal Forest is found in Forest Reserves.

Biological Importance

Information presented at the Workshop showed that for each group of animals and plants the Coastal Forests support species found no-where else in the world (endemic). The survival of the Coastal Forests is vital for the continued existence of these species, which number at least 500.

The endemic species are not evenly spread through the Coastal Forests. The Coastal Forests of southern Kenya and northernmost Tanzania support a large number of endemic species, as do those around Dar es Salaam in central coastal Tanzania, and those to the south of the Rufiji river in Tanzania. Furthermore, many Coastal Forest endemic species appear to be confined to one, or a few, sites. These sites are often widely separated even though suitable habitat appears to occur in-between. Reasons for the disjunct distribution patterns of Coastal Forest species are not known, but they appear to be present in all groups of flora and fauna inhabiting the Coastal Forests.

The Workshop discussed information on which species are endemic or near-endemic to the Coastal Forests, for a number of plant and animal groups. Examples are given below:

- Over 400 species of plants are confined to the Coastal Forests area, and about 300 of these are forest-specific. Moreover, about 75 new plant species of Coastal Forests have been discovered in the past 5 years, and the Coastal Forests of eastern Africa are now recognised as a major centre of plant endemism within Africa. There are some 40-50 endemic plant genera restricted to Coastal Forests. Many plants are confined to one or only a few forests and hence their survival is extremely precarious. Some of these endemic plants are of medicinal and agricultural value, e.g. there are several species of Coffee.

- Five species of birds are restricted to these forests, and around 18 more have a significant proportion of their global population in Coastal Forests. Endemic species are: Sokoke Scops Owl, Sokoke Pipit, Clarke's Weaver, Little Yellow Flycatcher and Reichenow's Batis. Near-endemic species of bird in the Coastal Forests are Fischer's Greenbul, Fischer's Tauraco, East Coast Akalat, Spotted Ground Thrush, Mombasa Woodpecker, Amani Sunbird, Southern-banded Snake Eagle, Green Tinkerbird, Plain-backed Sunbird, Uluguru Violet-backed Sunbird, Kretschmer's Longbill, Tiny Greenbul, Chestnut-fronted Helmet Shrike, Usambara Eagle-owl, White-winged Apalis and Swynnerton's Robin. Taxonomic debate surrounds four further bird species on Pemba Island in Tanzania which some ornithologists regard as full species and others as sub-species; some of these are associated with forest

- At least five species of mammal are endemic to these forests. These are: Ader's Duiker, Golden-rumped Elephant Shrew, African Woolly Bat, Pemba Fruit Bat, and the bat *Rhinolophus deckenii*. The Zanzibar Red Colobus is also endemic if it is accepted as a full

species. The Coastal Forests also contain four undescribed species of shrew, one or two new species of bush-baby, a new species of bat and a new rodent. Many of these new species are in the process of being scientifically described. Some authorities would also include the two monkey species confined to the Tana river forests in Kenya in the Coastal Forests; these species are *Cercopithicus galeritus* and *Procolobus rufomitratus*. The bats *Myonycteris relicta* and *Tardarida brachyptera*, the Zanzibar Bush-baby, and the Black and Rufous Elephant Shrew are near-endemic as they are only found in Coastal Forests and Eastern Arc mountain forests.

• There are five endemic species of amphibian in the Coastal Forests.

• There are approximately 20 endemic species of reptile in the Coastal Forests.

• There are a large number of endemic invertebrates such as millipedes (at least 20 species) and butterflies (about 40 species) in the Coastal Forests.

In general, numbers of endemic species in the different biological groups present in the Coastal Forests are somewhat lower than in the Eastern Arc mountain forests of Tanzania and southern Kenya, which are of widely recognised global importance for the conservation of biodiversity. However, when the forest area in the Eastern Arc and the Coastal Forest are compared, the levels of endemism in most biological groups are similar between the two forest types. Hence it can be proven that the conservation priority of the Coastal Forests is very considerable.

Ranking Coastal Forests in terms of their significance for biodiversity conservation proved difficult as data were incomplete for many groups of animals and plants. The bird fauna was found to provide the best means of ranking the forests, since the data for this group are quite complete and the species are well known. In terms of ornithological significance the 10 most important Coastal Forests for conservation in Kenya and Tanzania are (arranged North to South): Witu (KE), Tana River (KE), Arabuko-Sokoke (KE), Shimba Hills (KE), Mkongani (KE), lowlands of the East Usambaras (TZ), Kiono/Zaraninge (TZ), Pugu & Kazimzumbwe (TZ), Litipo (TZ) and the Rondo Plateau (TZ). Information for other countries was insufficiently analysed to permit further ranking to be completed.

Threats:

Participants at the Workshop reviewed the most significant threats to the remaining Coastal Forests. These are activities which result in the extraction of large quantities of woody material (timber, charcoal, poles, fire-wood), leading to the degradation of forests, and occasionally their destruction. In addition, agricultural encroachment poses a major threat, particularly since the pressure on land is increasing as a result of the rapidly expanding coastal population. Most Coastal Forests are already surrounded by agriculture.

Management and Policy Issues:

The Workshop participants reviewed management and policy issues relating to the conservation of Coastal Forests in Forest Reserves. They proposed the following short-, medium- and long-term solutions to alleviate current problems and conserve the largest possible area of Coastal Forest:

Short and Medium term solutions:

• Government Forestry Divisions are the obvious agencies to implement and enforce protection and management of Coastal Forests. Coastal Forest Units within the Forestry Divisions should be established in order to concentrate expertise and resources in one area. This is necessary because East African government Forestry and Wildlife services currently do not have the resources to manage and protect all those natural resources under their control. Considerable support, both in terms of financial and technical assistance, is needed if a higher

level of management of the Coastal Forests is to be achieved. In addition consideration must be given to the needs of the local communities, and substitutes or alternatives provided to replace their dependence on resources from the Coastal Forests.

• All larger areas (perhaps minimum area of $2km^2$) of Coastal Forest outside of the protected area network should be gazetted as Forest Reserves or other forms of protected area (e.g. National Reserves, National Parks).

• Forest Reserve boundaries should be clearly demarcated. Possibilities are clearing a narrow border round the Forest Reserve, planting a margin of an obvious tree species, or locating obvious boundary beacons. In many cases none of these options have been used for over 20 years. Priority should be given to sites which are of high biological importance, and to boundaries where there is a significant risk of encroachment.

• Immediate action should be taken to provide acceptable substitute sources for the poles and fuel-wood which are presently obtained from the Coastal Forests. This should reduce the pressure on the forests.

• Management control needs to be stepped-up and maintained to prevent further degradation over the period when alternatives are being provided.

• Non-governmental organisations (NGOs) can have a role in bringing additional funding and management capacity to assist the government agencies to improve management and provide alternatives to the local people living around Coastal Forests.

• Socio-economic studies and needs assessments (e.g. Participatory Rural Appraisal) must be undertaken around the most important Coastal Forest sites. This will assist in planning the utilisation of Coastal Forest resources and the provision of appropriate alternatives.

Long term solutions

• Education and training are necessary for local populations. Training should concentrate on the alternative means available of obtaining essential products such as building poles, fuel-wood, and charcoal. Tree nurseries should be encouraged and new technologies such as brick making and more efficient cooking stoves should be introduced.

• Education and awareness programmes are necessary throughout the coastal area to sensitise people to the value of the Coastal Forests, including officials and politicians.

• The structure of the Forestry Divisions in eastern African countries (particularly Tanzania) need to be altered in the light of existing critical assessments of their performance, to ensure that they operate at maximum efficiency.

1. INTRODUCTION

The Coastal Forests of eastern Africa are biologically distinct from all other forest-types in Africa. They are believed to have existed for millions of years (Andrews & Couvering, 1975; Axelrod & Raven, 1978; Hamilton, 1982; Hawthorne, 1993) and are known to support many unique species of animal and plant (e.g. Burgess *et al.*, 1993).

Climatic and Human Influence

The climate of Africa has varied dramatically over the past 30 million years which has had a major effect on the distribution of forest vegetation in eastern Africa (Griffiths, 1972; Andrews & Couvering, 1975; CLIMAP, 1976; Axelrod & Raven, 1978; Flenley, 1979; Hamilton, 1982; Bonnefille *et al.*, 1990; Kingdon, 1990; Lovett, 1993a). During wetter periods forest would have extended from the East African coast to the Congo Basin in the west. During drier periods the forest became fragmented and in eastern Africa was confined to the mountains and perhaps the coastal area. The most recent major fluctuations in the climate occurred during the recent Ice-Ages, which started around 2 million years ago. During the periods of maximum advance of ice in the northern and southern Hemispheres, the climate of the tropical areas became much drier. However, the climate of the coastal area of eastern Africa remained wetter then elsewhere in the region because of the proximity of the warm Indian Ocean. Hence the Coastal Forests of eastern Africa survived when other lowland forests were lost. At their maximum extent in the interglacial warm periods, there was probably a swathe of Coastal Forest along the coast from northern Kenya to southern Mozambique.

In recent times, human activity has had a more significant impact on the Coastal Forests than those caused by climatic changes (e.g. Freeman-Grenville, 1967; Alpers, 1975; Spear, 1978; Sutton, 1990; Pakenham, 1991). Human influence probably began approximately 200,000 years Before Present (BP) with the increased use of fire for hunting purposes (Clark & Harris, 1985; Rodgers, 1993). The first direct evidence for additional burning is around 55,000 years BP. A regime of regular burning would not only have destroyed some of the drier lowland forest types, but made regeneration more difficult for some forest types. It is likely that the driest forest types were replaced by a more fire-adapted savannah-woodland. Today, the most intact forests are located on hills along the coast, perhaps because these locations are wetter than elsewhere.

The earliest records of extensive agricultural clearance in the coastal area are from the Usambara Mountains at around 500 B.C (Sutton, 1966; Soper, 1967; Gramley, 1978). Such activity was made much easier around 2000 years ago with the arrival of iron tools. Clearance of forest for agriculture, together with utilisation of forest for fuel-wood (both for smelting iron and as a domestic cooking fuel) meant that forest clearance probably accelerated from this time (Burgess & Clarke, in prep.).

It is thought that prior to the arrival of the Portuguese in 1498, the peoples living in the coastal area of eastern Africa did not form permanent settlements (Freeman-Grenville, 1967). The Portuguese introduced many new crops from the New World (cassava, maize, papaya, cashews, avocados) and from India (mangoes), which enabled the land to support more people and for them to become more settled.

In the 1800s the major colonial powers arrived in eastern Africa and during the period 1800-1920 national boundaries were established, improved medicines were introduced, and there was a gradual end to slavery (Freeman-Grenville, 1967; Alpers, 1975; Sutton, 1990; Pakenham, 1991). However, this period was also accompanied by a large drop in the human population due to the continuation of slavery until 1918, war, disease and starvation. Large tracts of land were also cleared of vegetation and people to grow new cash crops such as sisal, cloves and rubber. The population of the coastal belt started to increase again from the 1920s, increasing the demand for fuel-wood, agricultural and building land and building materials. It

was also during the Colonial era, particularly in the 1955-1964 period, that most of the existing system of Forest Reserves in the coastal area was established to protect the best remaining areas of Coastal Forest for water catchment and conservation purposes (Burgess & Clarke, in prep.).

The population of coastal areas has continued to increase since the independence of the eastern African countries in the 1960s & 1970s, mainly through high birth rates of around 3% per annum, although there has also been considerable in-migration to some major urban centres in the coastal area. In towns such as Dar es Salaam the annual population growth rate may be up to 10%, which has led to a high demand for forest resources (principally charcoal as cooking fuel, and timber and poles for building). This is having a serious impact on the remaining forests (e.g. Rodgers, 1993).

Influence of Geology and Soils

The base-rock geology of the coastal area of eastern Africa is quite varied (Kent *et al.*, 1971; Griffiths, 1993). It includes limestones, sandstones, ancient crystalline rocks and recent deposits of sands and marine silts and clays. This is reflected in the varied nature of the soils at different locations (Milne, 1947; Hawthorne, 1993). The variation in the soils is thought to influence the vegetation which in turn may influence the animals which live in a forest. However, the exact relationship between the soil and the biology of a forest is not known.

History of Research in Coastal Forests

In the last century, biological exploration in eastern Africa was focused in Mozambique which was under Portuguese administration, and in Zanzibar. Consequently, many of the animals and plants found in these forests have names such as *mozambiquensis* and *zanzibaricus*.

With the arrival of the German and British colonial powers in Tanganyika and Kenya respectively, the mainland areas were opened up to exploration. This permitted research in the more spectacular mountain forests inland of the Coastal Forests and biological research was concentrated in the mountains for many years, particularly at the Biological-Agricultural Research Station at Amani in the East Usambara mountains of Tanzania .

From the 1920s through to the 1960s, only a handful of expeditions and research projects conducted studies in the Coastal Forests of Tanzania and Mozambique (e.g. Howell, 1981), although research effort in the Kenyan Coastal Forests was more intense (Dale, 1939; Burtt, 1942; Moomaw, 1960; Birch, 1961; Greenway, 1973). Conversely, there had been considerable biological research in the mountain forests from the late 1800s (see Gillett, 1961; Iversen, 1987; Lovett, 1993b; Lovett & Wasser, 1993). This work, allied to the fact that an individual Coastal Forest does not usually possess the diversity of habitats and species found in montane forests, meant that it was the mountain forest sites that became recognised as centres of exceptional biological importance on a global scale (e.g. Stuart *et al.*, 1990).

This situation began to change in the 1960s & 1970s when research activity in the Coastal Forests intensified. Important in this respect were the Forest Research Group at the University of Dar es Salaam, and the Herbarium staff of the National Museums of Kenya. Expeditions to several forest sites in the early 1980s further stimulated interest as the ornithological importance of these forest patches was more widely recognised (Kelsey & Langton, 1984). In Kenya, starting from 1985/6, intensive surveys of the Kaya forests began in order to assess their botanical and other biological importance, and have since been extended to all Coastal Forest sites remaining in Kenya (Robertson & Luke, 1993).

Further north, the last remnants of Coastal Forest in Somalia were visited by the Somalia Research Programme in 1986 (Madgwick, 1989).

More recently Coastal Forest research projects were initiated in Tanzania in 1988 by the Wildlife Conservation Society of Tanzania (WCST) and ICBP Denmark, and in 1989 by

Frontier-Tanzania - a collaboration between the Society for Environmental Exploration (UK) and the Faculty of Science at the University of Dar es Salaam. In particular, the Frontier -Tanzania Coastal Forest Research Programme has systematically visited most Coastal Forests between the Kenya and Mozambique borders (see Burgess *et al.*, 1992; 1993). Further research initiatives are planned in Tanzania under the Global Environment Facility (GEF) funded Coastal Forest Project, being run by WCST, the University of Dar es Salaam and the Tanzanian government.

2. ORGANISATION & OBJECTIVES OF THE COASTAL FOREST WORKSHOP

By the late 1980s the Coastal Forests were known to be of major importance for the conservation of biological diversity, and to be exposed to very high levels of threat from human use. It became apparent that unless urgent action was taken many of the forests would be totally destroyed. The various studies and initiatives that were underway in the Coastal Forests were also not communicating effectively, and it became clear that this lack of coordination presented a barrier to the conservation effort. To assist the conservation of the Coastal Forests it was considered a priority for the interested parties to meet and discuss their activities and findings.

The aim of the Workshop was to assemble the agencies interested in Coastal Forest conservation to compile general information on the distribution of forest and its biological and social importance. From the information it was hoped that an agenda for future action could be produced.

To collect the necessary information before the Workshop took place, standard data-sheets (Appendix 3) were dispatched to a large number of potential participants in early 1993. The response was very encouraging. Completed forms were received at least two weeks before the Workshop. It was thus possible to enter the data on spreadsheet programmes to be utilised during the Workshop. A large map showing the position of all Coastal Forests above 1km^2 in area was also compiled for discussion and amendment.

The following were the aims of the Workshop:

1. Forest Distribution

To produce maps showing the distribution of all Coastal Forests in eastern Africa.

2. Biological Importance

To prioritise forests in terms of the plants and animals they support.

[For this Workshop the number of Coastal Forest endemic, or near-endemic species were used to determine the biological importance of a particular forest. (Section 6).]

3. Threats

To prioritise forests in terms of the level of threat to which they are exposed.

[A high priority was placed on identifying and cataloguing the nature of the threatening activities and their incidence and intensity across the Coastal Forests. Information about the success or effectiveness of any solutions which have been employed to reduce particular threats were also searched for (Section 7).]

4. Conservation, Policy and Research

To combine biological and conservation priorities to determine which areas of research, conservation action and policy change are necessary for effective conservation of the Coastal Forests (Section 8).

The full programme of the Workshop, held from 9-11 August 1993 is presented in Appendix 1, and the names and addresses of participants are presented as Appendix 2.

3. BIAS IN THE DATA

We feel that it is important to explain the reasons behind the apparent bias in available information towards Kenya and Tanzania so that the findings of the Workshop are not misinterpreted.

Bias is largely due to the variable level of study effort devoted to Coastal Forest research in each country. For example, research effort in the forests of Mozambique has been very low due to the restrictions imposed by the prolonged period of insecurity. Consequently, there has been little opportunity for researchers to study and prioritise the forests here and thus the biological importance and threats to these areas remain relatively unknown to interested parties.

In comparison, significantly more is known about the distribution, status and species diversity of Coastal Forests remaining in Kenya and Tanzania. This is due to easy accessibility, greater national and international interest, and a number of long-term research programmes. Consequently, many of the Coastal Forest sites in these countries have been studied, at least to some extent.

As well as the degree of study effort expended in each country, another factor that has affected the findings is the subjectivity of the participants when completing the data forms prior to the Workshop. For example, the degree of threat described for a particular forest depends to some extent on the perception of the person completing the data-form.

4. DEFINITION OF COASTAL FORESTS

A) Definition of forest

The Workshop accepted the definition in White (1983) as an appropriate working model for the definition of forest.

Forest is:

A continuous stand of trees with a canopy height of more than 6 metres, the crowns of which overlap or interdigitate. Normally a shrub layer is present, but at ground level vegetation is sparse or absent. Lianas are characteristic and epiphytes are found in moister areas.

Coastal Forests in an undisturbed state, or potential climax state, fit this definition but contain a distinctive fauna and flora. This includes many endemics which occur within the geographical range outlined on Figure 1.

B) Definition of Coastal Forest

There was considerable debate during the workshop on this complex issue. Although an exhaustive assessment of the available definitions of forest was not made during the workshop, the following definition was proposed as a working system for the Coastal Forests.

Coastal Forests are:

Present in eastern Africa on the coastal plain between the mangroves and montane forests, below an altitude of 500-700m. The forests are influenced by the Indian Ocean climatic system; typified by annual rainfall between 800 and 1500 mm (to 2000 mm on off-shore islands) and temperatures ranging from 25-30°C throughout the year. Rainfall is strongly seasonal with a pronounced dry season of 2-3 months from July to September.

The effects of drainage, topography, altitude, geology, soil moisture content and distance inland may all combine to determine which sites are able to support a Coastal Forest.

Coastal forest includes:

a) Zanzibar-Inhambane undifferentiated forest (*sensu* White 1983) . [Variant formation has no shrub layer]

b) Transition Forest (=Zanzibar-Inhambane Transition Woodland, *sensu* White 1983). [Variant formation on poor soils, has fewer species]

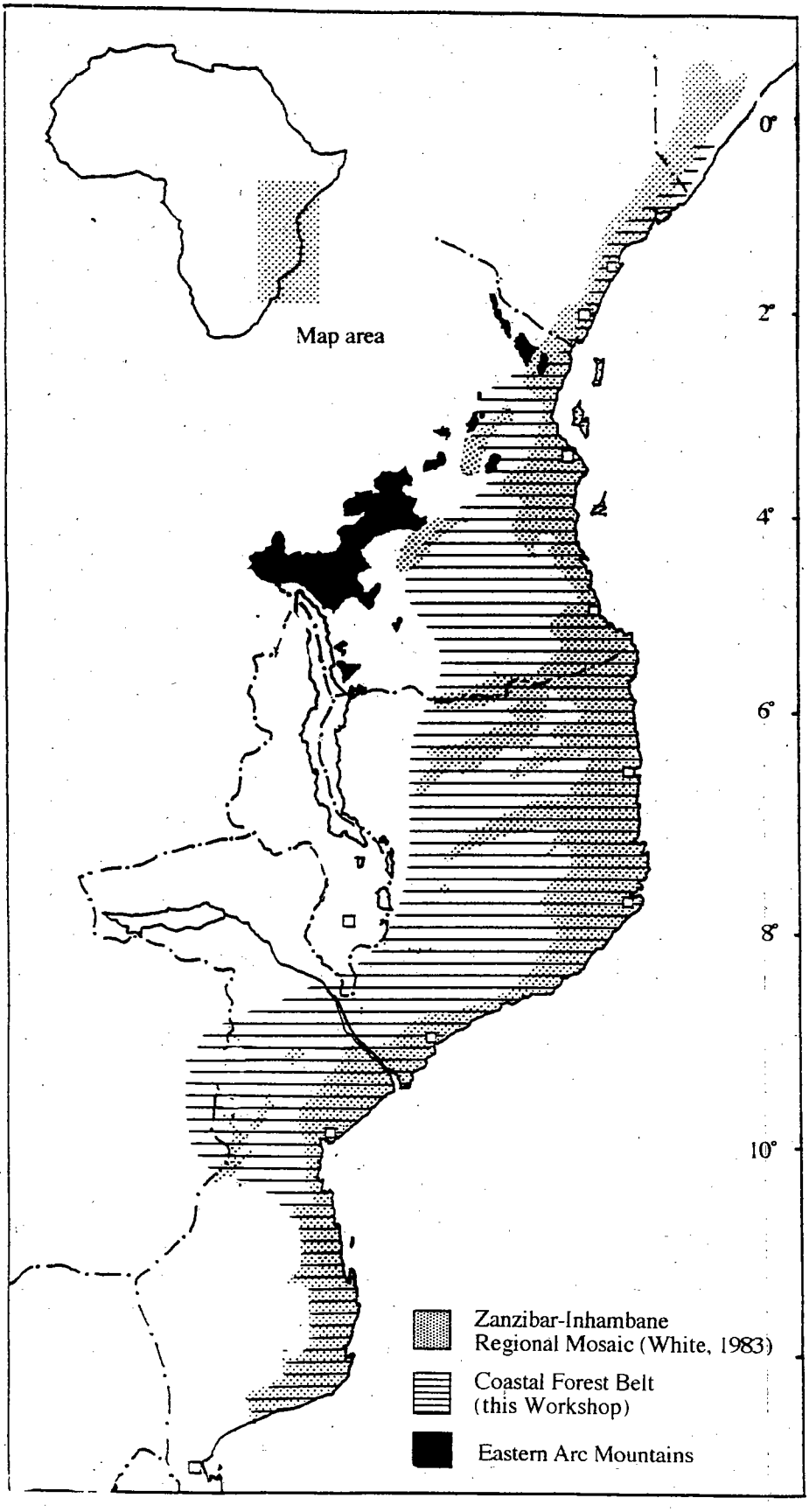
Coastal forest excludes:

a) Coastal Thicket. [Probably mainly derived from Coastal Forest: up to 4m high with no stratification BUT it has its own conservation value]. May be a stage in the regeneration of Coastal Forest.

b) Sub-montane Forest. [Biologically part of Eastern Arc domain BUT intergrades with Coastal Forest at lower altitudes]

c) Southern African Dune Forest. [Tongoland - Pondoland forest type mainly BUT intergrades - with Coastal Forest in S. Mozambique (Maputo) and South Africa]

FIGURE 1: COASTAL FOREST BELT IN EASTERN AFRICA AND LOCATION OF THE EASTERN ARC MOUNTAIN FORESTS IN TANZANIA



5. STATUS OF COASTAL FORESTS IN EASTERN AFRICA

Full data on the status of the Coastal Forests known to exist in eastern Africa are presented in Appendices 4 & 5, and these are summarised in Figure 2.

FIGURE 2: COASTAL FORESTS IN EASTERN AFRICA - MINIMUM AREAS (KM^2), BY COUNTRY

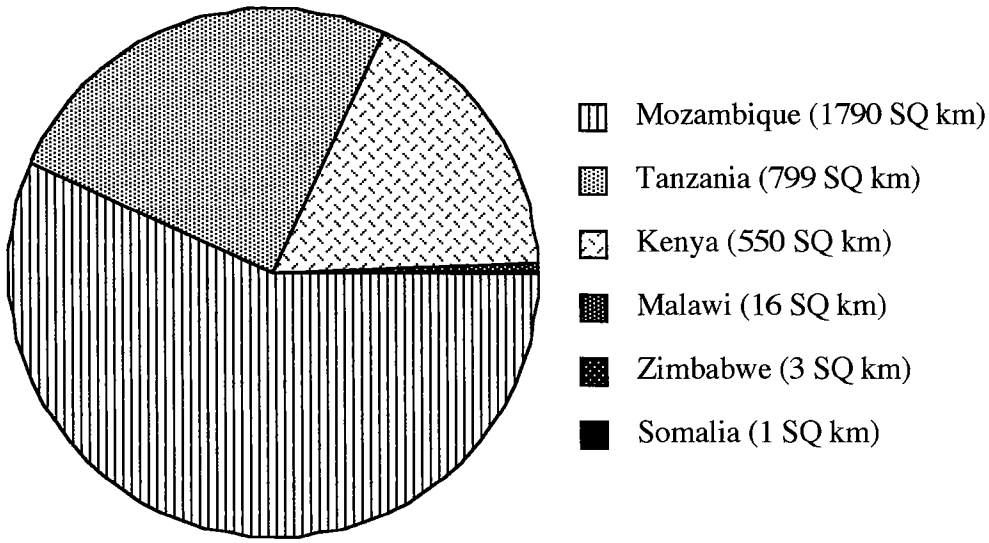


Figure 2 shows that the largest area of Coastal Forest is thought to remain in Mozambique, although this information needs to be verified by ground survey of most sites. The next most important countries in terms of their area of Coastal Forest are Tanzania and Kenya, which both have over $500km^2$ of forest. In comparison the area of Coastal Forest in Zimbabwe, Malawi and Somalia is small.

There may still be some discrepancy between what has been termed Coastal Forest in these various different countries, despite the efforts made to standardise information at the Workshop. The greatest problem is probably in the large area of Coastal Forest quoted for Mozambique, although difficulty was also experienced in ascribing areas of high forest to some of the Coastal Forest sites in Kenya. This problem means that the areas of forest quoted above might vary if the data were interpreted by others.

Figures 3-6 show the location and approximate size of Coastal Forest sites in Somalia, Kenya, Tanzania, Mozambique, Malawi and Zimbabwe. Further data on all Coastal Forests in eastern Africa, arranged north to south, are presented as Appendix 4. The Coastal Forests are also presented in terms of the area of remaining forest in Appendix 5.

FIGURE 3: DISTRIBUTION OF COASTAL FORESTS IN SOMALIA

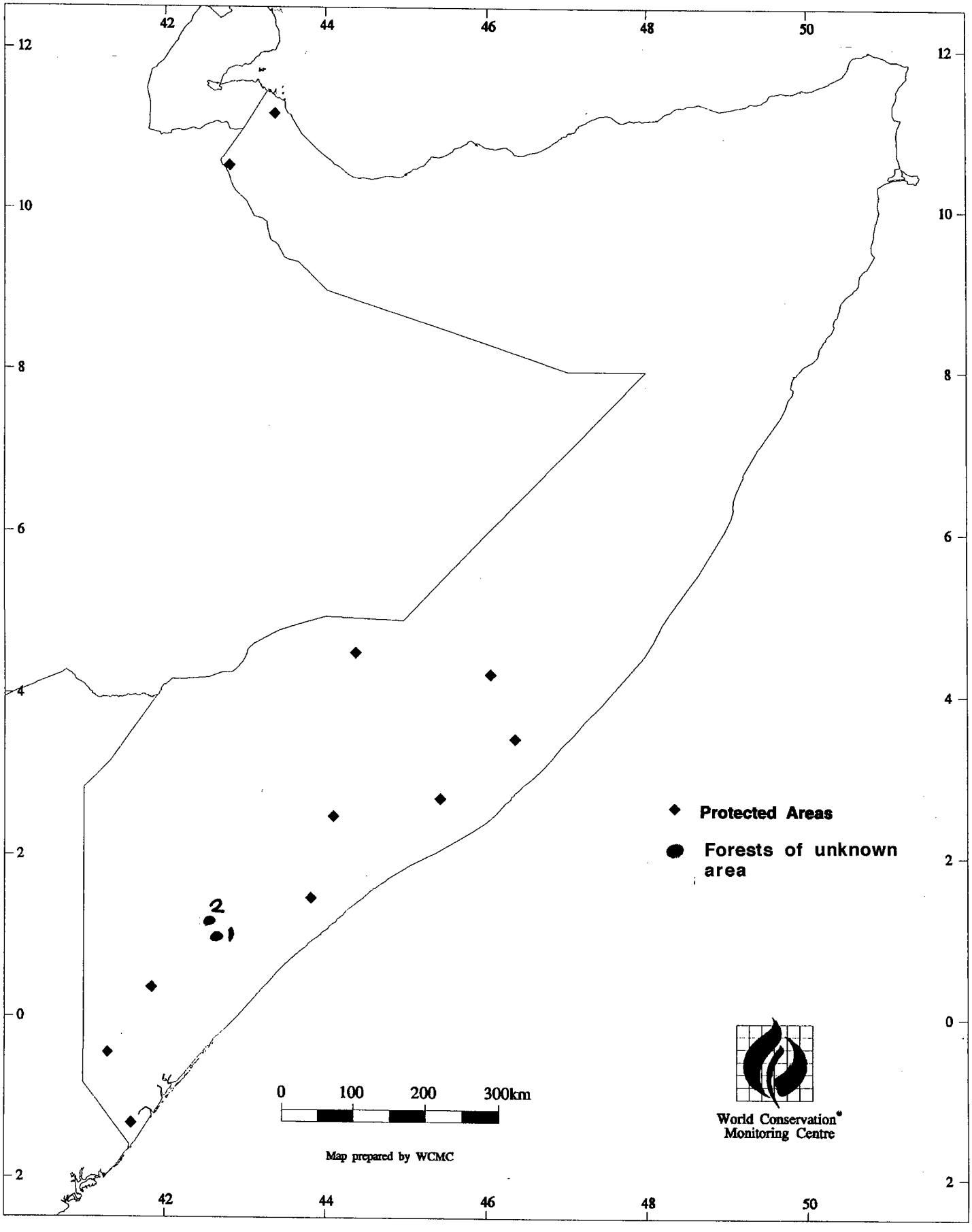


FIGURE 4: DISTRIBUTION OF COASTAL FORESTS IN KENYA

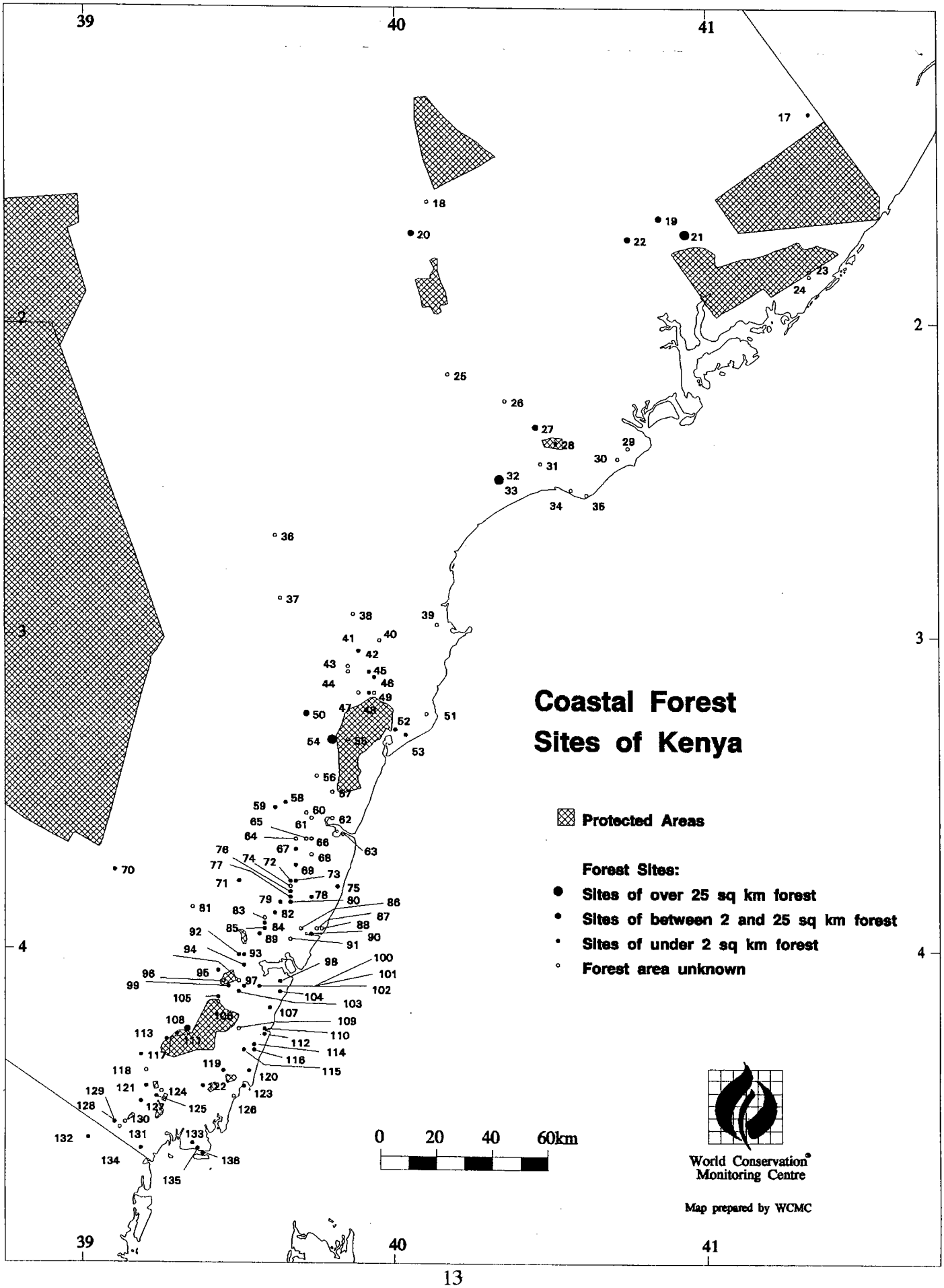


FIGURE 5: DISTRIBUTION OF COASTAL FORESTS IN TANZANIA

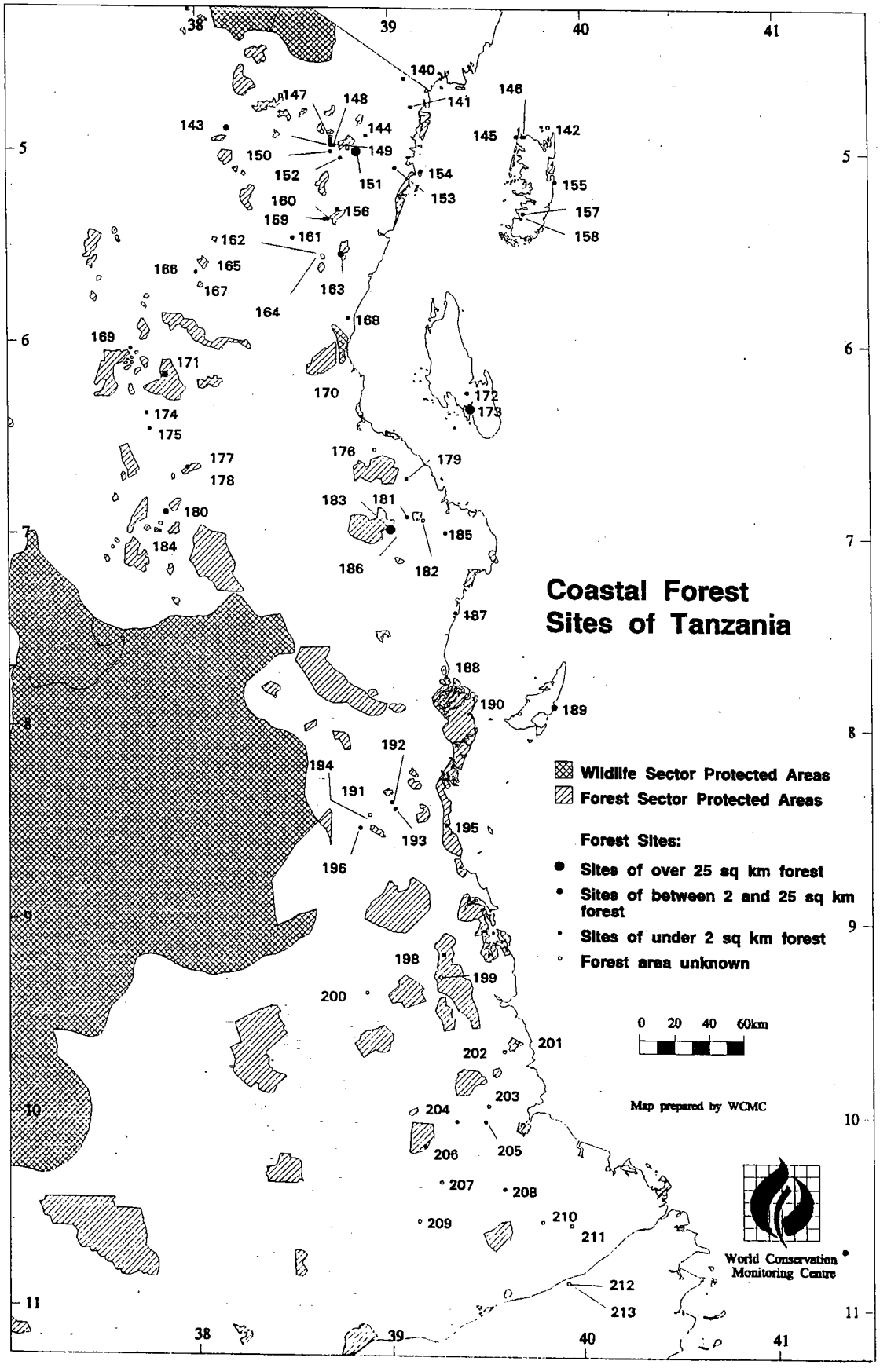
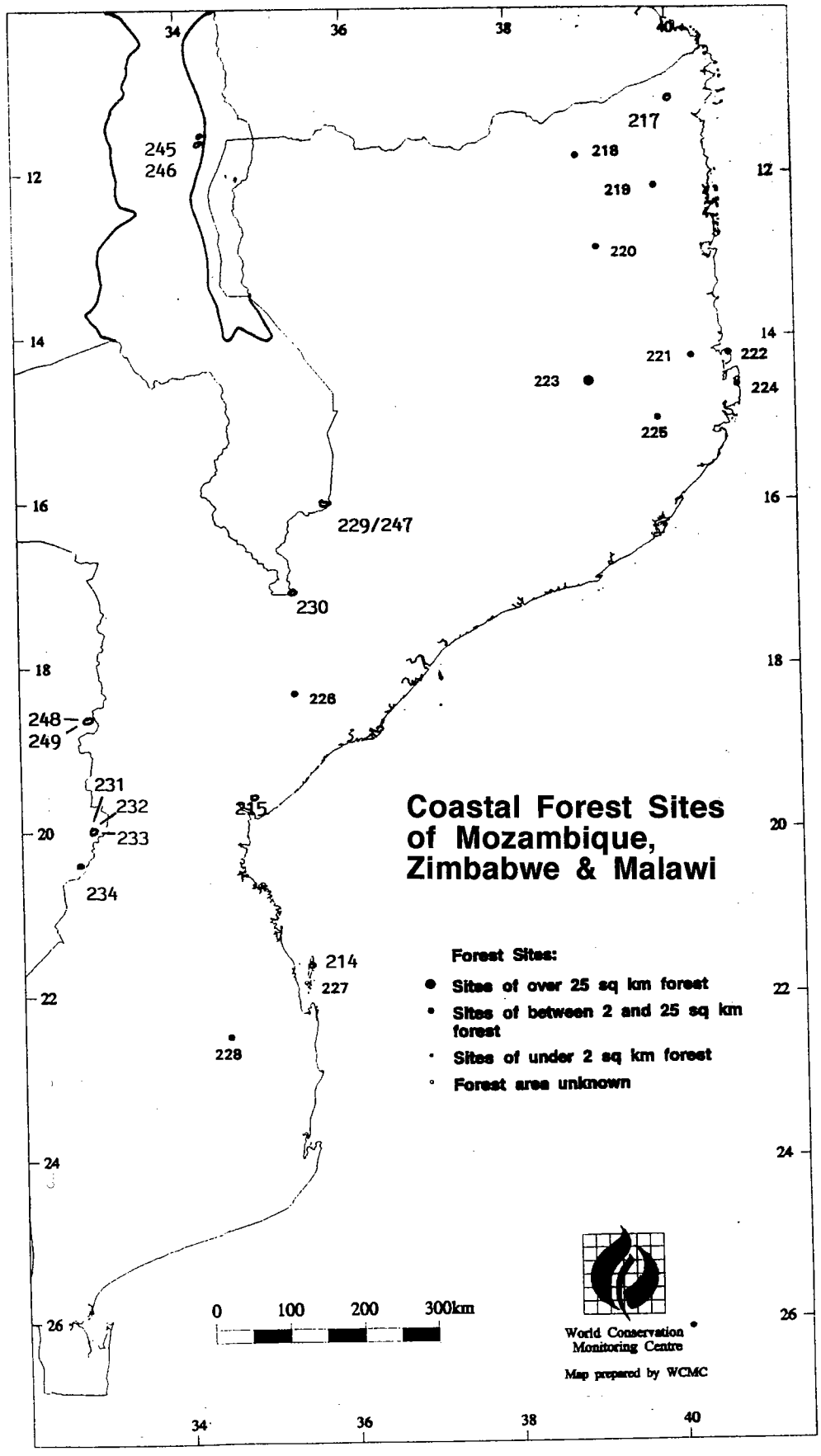


FIGURE 6: DISTRIBUTION OF COASTAL FORESTS IN MOZAMBIQUE, ZIMBABWE & MALAWI



Focus on Somalia

Only three Coastal Forest sites are thought to exist in Somalia: the Boni Forest which overlaps into Kenya, and the Shoonto and Baroko Madow Forests bordering the Jubba river. Both forests bordering the Jubba river may have been cleared since the last survey in 1986 (Madgwick, 1989), although a 1994 aerial survey indicates that at least one patch may still exist (Clarke, in litt).

Focus on Kenya

Prior to the Workshop, the Kenyan definition of Coastal Forest included:

- "Coastal Forest mosaics", which may have only very small amounts of forest;
- vegetation with forest or forest elements,
- forest in matrix with other vegetation.
- areas supporting natural vegetation (i.e. not cultivated)

Such a non-specific definition was aimed at encouraging the preservation of all natural vegetation remaining along the Kenyan coast. However, this resulted in the Kenyan data not being directly comparable with the Coastal Forest in Tanzania and elsewhere.

An attempt was made at the Workshop to standardise the usage of the term Coastal Forest and now only the Kenyan sites which are given three stars (***) in Appendix 4 (even if some of that area might not be forest) are regarded as equivalent to Coastal Forest in other countries. Only these sites have been used to compile Figures 4 and 7(a) & (b) (Coastal Forests in Kenya). However, considerable difficulty was still experienced in the use of the Kenyan data.

Furthermore, some of the sites with National Monument, National Reserve or Forest Reserve status in Kenya are also sacred 'Kaya' sites. For this report only Kaya sites which have no other status are included under this category. More detail on the Coastal Forests of Kenya is found in Robertson & Luke (1993).

FIGURE 7 A): LAND OWNERSHIP STATUS OF COASTAL FORESTS IN KENYA, BY AREA

n: 29 *** forests (high forest) with status data

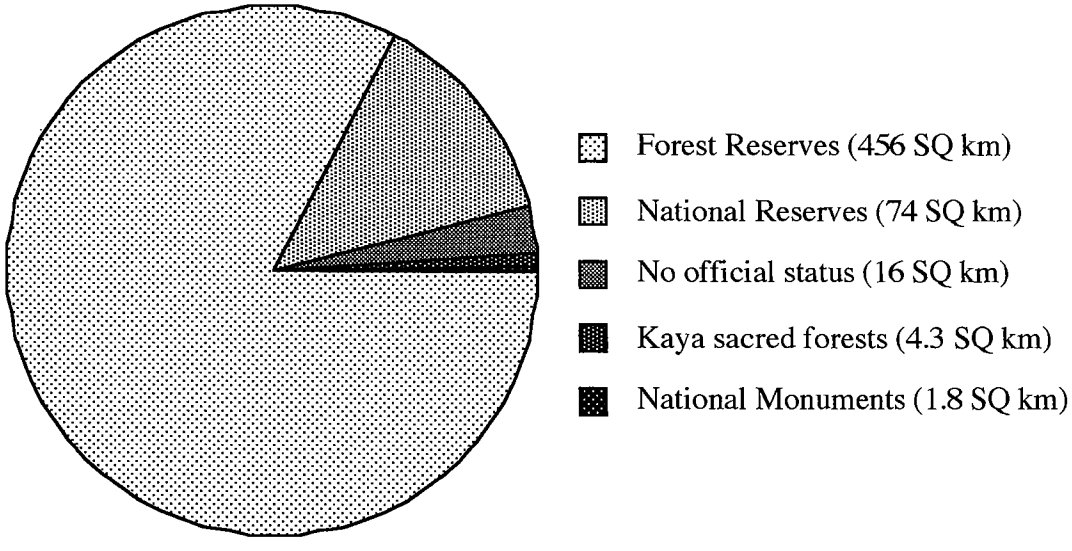


Figure 7 a) shows that the largest area of Coastal Forests in Kenya come under Forest Reserve and National Reserve status with only a very small proportion of the total Coastal Forest area protected as National Monuments or Kayas. A number of Coastal Forests in Kenya have no official status, although they are owned privately, by Trusts etc.

FIGURE 7 B): LAND OWNERSHIP STATUS OF COASTAL FORESTS IN KENYA, BY NUMBER OF SITES

n: 36 *** forests (closed canopy) from total of 136 sites with 'forest'

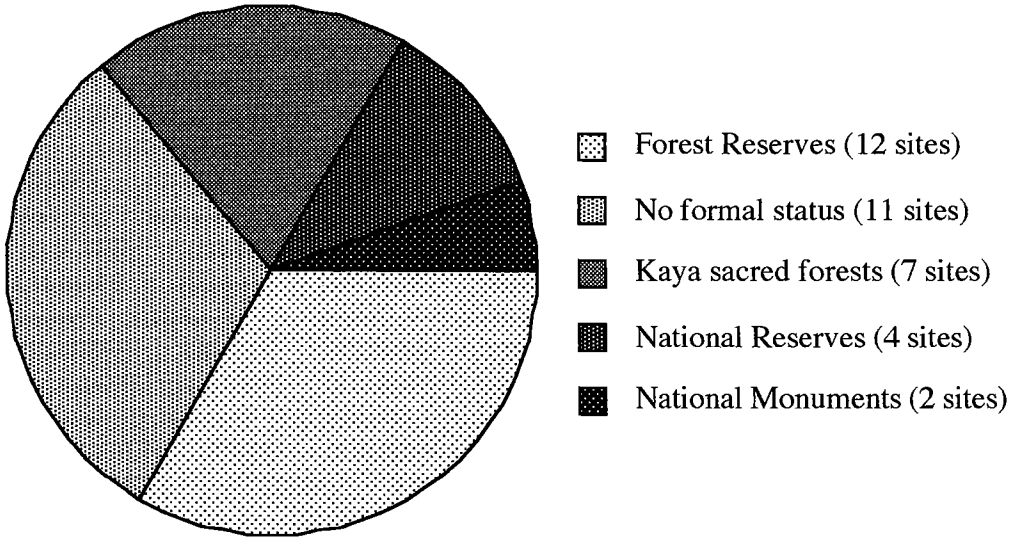


Figure 7 (b) shows that in Kenya there are nearly as many sites without formal status (Trust Land, Private Land etc.) as Forest Reserves supporting Coastal Forest. However, the forests in Forest Reserves are much larger than those in the other categories (see Figure 7 (a)).

Areas which still need to be surveyed in Kenya are:

- Boni forest on the Somalia border
- North Kilifi District
- Mouth of the Tana River

Results for these areas may influence the overall patterns presented above.

Focus on Tanzania

Seventy six forest sites are known to exist in Tanzania, and a few more are probably present in remote locations. In Tanzania, only closed canopy forests which are not mangroves or high altitude forests have been surveyed. Dense woodland and thicket has been excluded, as have small patches (up to 1km^2) of closed-canopy forest. If the latter were included, the total forest area for Tanzania would be increased substantially, but data are not available on precisely how much forest is found in such tiny forest patches in Tanzania.

For Figures 8 (a) & (b), the data for Forest Reserves also includes "proposed" Forest Reserves. Further information on the Coastal Forests of Tanzania can be found in Burgess *et al.* (1992) and Sheil (1992).

FIGURE 8 A): LAND OWNERSHIP STATUS OF COASTAL FORESTS IN TANZANIA, BY AREA

n: 67 forests with area data

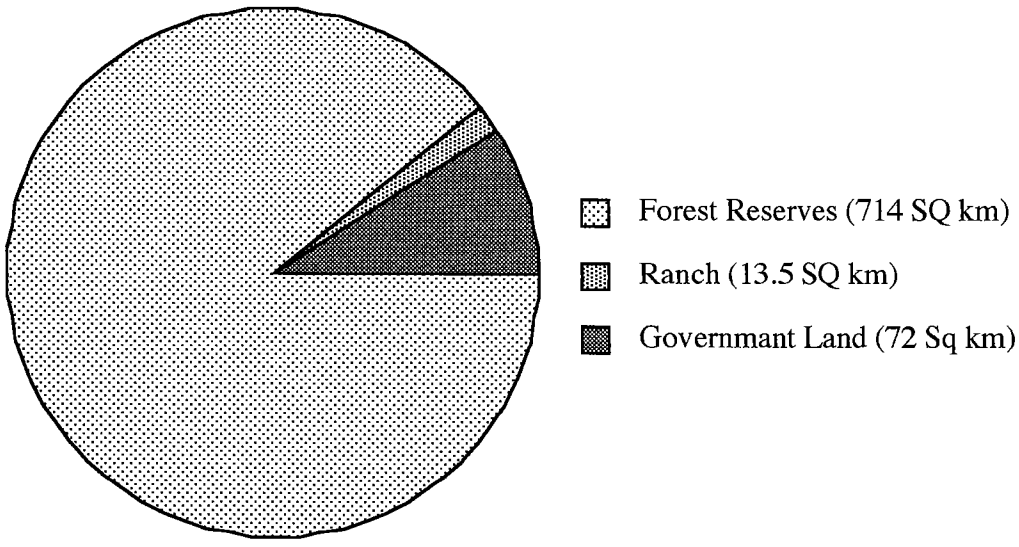
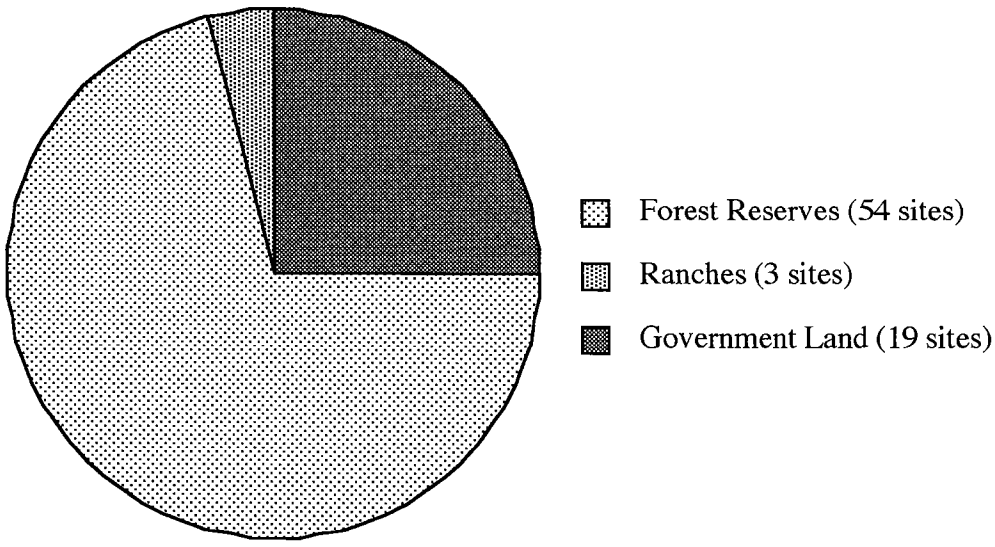


FIGURE 8 B): LAND OWNERSHIP STATUS OF COASTAL FORESTS IN TANZANIA, BY NUMBER OF SITES

n: 76 forests



Unlike Kenya, there are no Kayas or National Monument forest sites in Tanzania. Instead, almost 90% of the total area of forest and well over half the number of sites are gazetted as Forest Reserves. The only other significant form of forest ownership is privately owned lands, some of which incorporate Coastal Forest patches (e.g. Mkwaja Ranch & sisal estates). The remainder of the sites are in Government land without a formal land ownership status.

It is, however, important to note that the total Forest Reserve area (not shown) is substantially higher than the area of Coastal Forest remaining. This is because many Forest Reserves in coastal Tanzania contain no forest vegetation at all, and even the most forested of these reserves are not 100% forest covered.

Areas which need to be surveyed are:

- Kichi Hills
- Some forests in Kilwa District
- Forest in the Selous Game Reserve and at the base of the Eastern Arc Mountains (e.g. Udzungwa, Uluguru, Nguru and Usambara ranges).

Focus on Mozambique

There is apparently still a huge area of Coastal Forest remaining in Mozambique. Several Forest Reserves of around 200km^2 are reputed to contain forest over most of their extent. An aerial survey in 1980 suggested that there was 5000km^2 of Coastal Forest in existence, although the minimum area used here is 1790km^2. Ground truthing of most of this area is necessary to confirm the higher estimates, but the poor security situation has prevented most field work over the past 15-20 years.

Areas which need to be surveyed are:

- Sofala District (to confirm if forest is Coastal Forest or Afro-montane forest).
- Ground-truthing of almost all areas.

Focus on Malawi

Most of the evergreen forest in Malawi is montane to sub-montane, but there are three small remnant areas of Coastal Forest (Dowsett-Lemaire, 1990). One consists of two small Forest Reserves and various smaller patches near Nkhata Bay. The second consists of the Ruo Gorge Forest and other small patches surviving in the tea estates at the southern foot of the Mulanji Mountain. The third patch is on the Malawi Hills in the extreme south of the country.

Focus on Zimbabwe

Coastal Forest occurs in two areas of Zimbabwe at altitudes of 350-780 metres. In the Lower Pungwe valley, Nyanga District, nearly all the forest has been cleared for tea estates and cultivation by communal farmers. The largest surviving patches of forest are Rumbise Hill Forest (14.75 ha), Pungwe Bridge Forest (8.75 ha) and a riparian strip along the Chitema river just inside the Nyanga National Park (Timberlake, 1994). There is also extensive high to medium altitude forest on the eastern face of Nyangani Mountain.

At an altitude of 300-350 metres in the Haroni-Rusitu area of Chimanimani District there was originally an area of 30-40km^2 of Coastal Forest, which included some *Milicia excelsa* (Müller, 1991). The surviving forest patches are the Rusitu and Haroni Botanic Reserves (80 and 4 ha) and the Makurupini Forest in the Chimanimani National Park (170 ha), this being the largest Coastal Forest surviving in Zimbabwe (Timberlake, 1994).

South Africa

Similar forests also exist in coastal South Africa. However, in South Africa the vegetation is almost certainly Tongoland-Pondoland type, and hence is excluded from our definition of Coastal Forest (see earlier). However, pending confirmation of the nature of these forests, the location and status data on those forests in South Africa most similar to Coastal Forests are presented in Appendix 4.

6. BIOLOGICAL IMPORTANCE OF COASTAL FORESTS

6.1 IMPORTANCE OF COASTAL FORESTS FOR PLANTS

Although the vegetation of the East African coastal zone has been regarded as distinct from areas further inland for many years, the floristic importance of this area has only recently been recognised. The vegetation of the area is termed the Zanzibar-Inhambane Regional Mosaic and includes the Coastal Forests amongst a number of other vegetation types (White, 1983). The following text is based on Clarke (in press). Standard texts on the flora of the region are Brennan *et al.* (1960-1983) and Polhill (1952-).

6.1.1 Floral Endemism and Diversity

In the early 1980s it was estimated that 'a few hundred' vascular plant species were endemic to (only found in) the Zanzibar-Inhambane regional mosaic (White, 1983). Recent research has revealed that this figure is at least 500 species and may even rise as high as 700 species (Clarke, in press.). About 300 of these 500 species are confined to forests, although the exact habitat requirements of many species are not known and hence it may be that considerably more of the regional endemics (perhaps 400 species) are also strict forest endemics.

When compared with some other areas of tropical forest in Africa, the Coastal Forest area is shown to be botanically important because of a high rate of species endemism considering the small area of forest remaining (Table 1).

Table1: **Floral endemism in selected African tropical forests**

FOREST TYPES	No. endemic species	No. endemic genera	Forest area (km^2)	Endemic Species/area	Endemic Genera/area
Guinea Congolian	6,400 approx.	420	2,000,000	0.0032	0.00021
Eastern Arc Mountains	500-600	16	9,000	0.061	0.0017
Coastal Forests	300-500	40-50	4,000	0.1	0.01125

Data from Clarke (in press.)

The proportion of unique genera in the Coastal Forest area is also unexpectedly high when compared with other forest areas in Africa. The total number of vascular plant genera endemic to the Zanzibar-Inhambane regional mosaic has been estimated at 50 (Vollesen, 1992), but is probably closer to 40 (Clarke, in press.). Many of these endemic genera contain only one species and some have only recently been described. This level of generic endemism is higher than either the Guinea Congolian forests or the Eastern Arc forests and is also high in world terms (e.g. New Zealand has 39 endemic plant genera).

Vascular plant diversity in the Coastal Forests is also high, with at least 1,500 species present in the Kenyan and Tanzanian Coastal Forests, and perhaps 2-2,500 species found in all the Coastal Forests throughout eastern Africa. Species-diversity compares well with the floral diversity in some of the other major forest blocks in Africa (Table 2), but diversity at the level of the genus is low.

Table 2: **Floral diversity of selected African tropical forests**

FOREST TYPES	No Species	No. Genera	Forest Extent (km^2)	Total Species/ area	Total Genera/ area
Guinea-Congolian	~ 8,000	1,750	2,000,000	0.004	0.000875
Eastern Arc Mountains	2,000	>1150	9,000	0.22	0.127
Coastal Forests	2-2.500	approx. 450	4,000	0.56	0.113

Data from Clarke (in press.)

6.1.2 Floral Rarity

A number of the endemic species from the Coastal Forests are known from only one, or a very small number of sites. Although this may be partly due to the lack of botanical investigation in many areas, it also appears to reflect the true situation for many species. Some species are so rare that they are known from only a few specimens at a single tiny locality, some from a single old collection.

About one third of the Zanzibar-Inhambane endemics are restricted in distribution to one locality. This may mean that they have recently evolved in these locations, or that they are relicts from times when they were much more widespread. These species may have become isolated to tiny areas because the remainder of their former habitat (forest) has been removed by man.

The dry forest assemblages within the Coastal Forests are particularly dominated by endemic trees found in only a few locations, especially of the families Caesalpinoidae, Ebenaceae, Flacourtiaceae and Euphorbiaceae. There are also rare elements within the herbs (e.g. *Saintpaulia* - African Violets) and shrubs, especially in the Rubiaceae, Annonaceae and Acanthaceae (Clarke, in press.).

6.1.3 Habitat Uniqueness

Dry forest is elsewhere scarce on mainland Africa (but common on Madagascar). There is, however, a similar forest type in West Africa (Ghana), which contains the same tree genera composition as one of the eastern African Coastal Forest types. This may provide evidence for the past existence of a continuous band of dry forest across Africa.

Tropical dry forests are also highly threatened throughout the world, and have been described as the most threatened of all the major lowland tropical forest habitats (Janzen, 1988).

6.1.4 Biogeographical affinities.

The biogeographical affinities of the Coastal Forest species have been assessed from a sample of 1038 plant species collected from 13 forests in Tanzania (Table 3).

Table 3: **Coastal Forest species distributions**

MAJOR VEGETATION TYPES	No. of Species	Percentage of total (%)	Forest only	Percentage of total (%)
Zanzibar-Inhambane (Z-I) 'endemic'	306	29.4	125	12
Z-I and Zambesian	75	7.2	16	1.6
Z-I and Guinea-Congolian	35	3.4	20	1.9
Z-I and Madagascar/Malagasy	30	2.9	9	0.9
Z-I and Tongoland/Pondoland	11	1.1	6	0.6

Source: combined inventory from 13 Tanzanian Coastal Forests (sample size 1038 species (Clarke, in press)); Vegetation types follow White (1983).

Results from this work show that many of the plant species present in the Coastal Forests are endemic or near-endemic to the Zanzibar-Inhambane regional mosaic. Plants shared with other botanical zones are much fewer, and at all times the Zanzibar-Inhambane endemics dominate in terms of abundance.

The number of shared species between these various botanical zones does, however, imply that there has been some linkage of the forests in the past. In particular, the plant data support the hypothesis that the Coastal Forests have been linked to the Zambesian and Guinea-Congolian forests to the west, and that there has also been some linkage, or interchange, between the Coastal Forests and those of Madagascar. Notably there appears to have been less connection with the Tongoland-Pondoland vegetation further to the south.

The location of the Coastal Forests close to the Indian Ocean may also be responsible for the small number of South American and Asian genera and species in these forests. The majority of these species are known from very few sites and often on the islands off the mainland of Africa (e.g. Pemba). They may have arrived through long-distance transport, or might possibly have been brought to these areas by man.

6.1.5 Further observations (after Clarke, in press):

• An individual Coastal Forest has low plant diversity so that any one forest will fail to represent the true richness of the Coastal Forests as a whole.

• The relatively recent detailed investigations of the Coastal Forests, combined with the large number of extremely scarce regional endemics have combined to hide the true botanical importance of the Coastal Forests.

• Strong canopy dominance by a few tree species obscures the diverse tree flora unless detailed investigations are made.

• The restricted area of Coastal Forest remaining means that the overall species-richness is quite low, although this compares favourably with other floristic regions of Africa when the habitat area is taken into consideration.

• The majority of the Coastal Forest endemic plants are woody species, and some at least have probably been in existence for a prolonged period of time. They may represent relict species from the time when forest extent in Africa was greater than at present and the Coastal Forests were perhaps joined with the Guinea Congolian forests to the west and with those of Madagascar.

6.1.6 Research Priorities

The Workshop participants proposed the following research priorities:

a) Further field collecting, because a complete list of plants does not exist for any Coastal Forest. Moreover, in the past five years 30-35 new species have been collected in Kenya and about 40 new species in Tanzania.

b) Further study on the relationship between plants and their habitat to define true forest species and those which range into other habitats.

It was also recognised that the conservation of non-forest vegetation was a major issue in Kenya where few vestiges of the natural vegetation survive along the highly populated coastal area.

6.2 IMPORTANCE OF COASTAL FORESTS FOR BIRDS

Birds are probably the best-known biological group in the world. They are also well-known in eastern Africa (e.g. Clancey, 1971; Britton, 1980; Irwin, 1981). This detailed knowledge has allowed the various species of birds to be assessed in terms of their global rarity and distribution (Collar & Andrew, 1988; ICBP, 1992; Groombridge, 1993; Collar *et al.*, 1994). Such detailed information has allowed conservationists to develop systems to define conservation priorities in different parts of the globe (e.g. Collar & Stuart, 1988; Grimmett & Jones, 1989; ICBP, 1992).

Before the Coastal Forests Workshop, it was known that the southern part of the Kenyan and the northern part of the Tanzanian Coastal Forests were an 'Endemic Bird Area' as defined by the global bird conservation federation BirdLife International (ICBP, 1992). It was also known that the Coastal Forests of the southern Tanzanian coast were important because they supported one endemic bird species and were regarded as a 'Secondary Area' (ICBP, 1992).

Two of the Coastal Forests (Pugu Hills & Arabuko-Sokoke) have also been ranked amongst the 80 most important forests for bird conservation in Africa (Collar & Stuart, 1988). Some of the Coastal Forest birds are also known to be threatened with global extinction because they occur in only a few locations (Collar & Stuart, 1985; Collar & Andrew, 1988; Collar *et al.*, 1994).

6.2.1. Species endemism

The bird species which were regarded as endemic or near-endemic to the Coastal Forests by the workshop participants are presented below (Table 4). Their degree of rarity (measured as the number of sites at which they occur) is also indicated. This gives some idea of the importance of undertaking conservation action to try and conserve a particular species. Data presented by the workshop participants were also checked against Fry *et al.* (1988), Keith *et al.* (1992) and Collar *et al.* (1994), and some changes were made.

Table 4: **Bird Species endemic or near-endemic to the Coastal Forests, and their degree of rarity.**

Species are arranged by degree of rarity within each distribution category.

SPECIES	Coastal Forest	Coastal Forest & Eastern Arc	Coastal Forest & up to two other forest type (s)	DEGREE OF RARITY
Sokoke Scops Owl *(Otus sokokensis)*	x			3
Clarke's Weaver *(Ploceus golandi)*	x			3
Reichenow's Batis *(Batis reichenowi)*	x			3
Sokoke Pipit *(Anthus sokokensis)*	x			3
Little Yellow Flycatcher *(Erythrocercus holochlorus)*	x			2
Usambara Eagle-owl *(Bubo vosseleri)*		x		3
Amani Sunbird *(Anthreptes pallidigaster)*		x		3
Fischer's Tauraco *(Tauraco fischeri)*		x		1
Uluguru Violet-backed Sunbird *(Anthreptes neglectus)*		x		1
Tiny Greenbul *(Phyllastrephus debilis)*		x		1
Fischer's Greenbul *(Phyllastrephus fischeri)*		x		0
Spotted Ground Thrush *(Turdus fischeri)*			x	3
East Coast Akalat *(Sheppardia gunningi)*			x	2
White-winged Apalis *(Apalis chariessa)**			x	2
Southern-banded Snake Eagle *(Circaetus fasciolatus)*			x	2
Swynnerton's Robin *(Swynnertonia swynnertoni)*			x	1
Chestnut-fronted Helmet Shrike *(Prionops scopifrons)*			x	1
Plain-backed Sunbird *(Anthreptes reichenowi)*			x	1
Mombasa Woodpecker *(Campethera mombassica)*			x	1
Green-headed Oriole *(Oriolus chlorocephalus)*			x	1
White-chested Alethe *(Alethe fuelleborni)*			x	0
Kretschmer's Longbill *(Macrosphenus kretschmeri)*			x	0
Green Tinkerbird *(Pogoniulus simplex)*			x	0
TOTALS FOR EACH CATEGORY	5	6	12	

Key: The rarity scores were derived using the following criteria:
- 3: Species confined (breeding) to 5 or fewer sites;
- 2: Species found breeding in 6 to 15 sites;
- 1: Species found breeding in more than 15 sites;
- 0: Species common in many sites.

* Species not seen at the Coastal Forest locality on the Tana river for many years, but may still exist there.

As can be seen from this table there are five species which are wholly confined to the Coastal Forests, and a further six species which are found in these forests and the nearby Eastern Arc Mountains in Tanzania (see Figure 1). A final group of 12 species is found in the Coastal Forests and also in up to two other forest types in Africa, e.g. volcanic montane forests of Kenya/Tanzania, or other montane forests of Malawi/Zimbabwe/Mozambique, Eastern Arc Mountains. The known distribution of these birds in selected Coastal Forests is presented in Table 5.

Table 5: **Distribution of endemic and near-endemic birds in the Coastal Forests of eastern Africa**

	FORESTS																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Southern-banded Snake Eagle		x			x	x			x		x	x	x	x	x	x	x	x				x		x		x	x				
Fischer's Tauraco	x	x		x	x	x	x	x	x		x	x	x	x																	
Sokoke Scops Owl				x							x																				
Usambara Eagle Owl											x																				
Green Tinkerbird				x		x				x	x		x	x	x	x	x	x			x	x	x	x		x	x	x		x	
Mombasa Woodpecker				x		?		x	x		x		x	x	x																
Tiny Greenbul	x			x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x			
Spotted Ground Thrush			x	x	x	x											x	x					x	x							
East Coast Akalat		x		x	x						x						x	x					x	x		x			x		
Swynnerton's Robin											x																				
Kretschmer's Longbill											x		x	x	x		x	x			x			x			x	x			
Reichenow's Batis																							x	x		x	x	x			
Little Yellow Flycatcher	x	x		x		x	x		x	x	x		x	x	x	x	x	x				x	x	x							
Sokoke Pipit				x	x							x			x		x		x												
Chestnut-fronted Helmet Shrike				x	x	x					x	x	x	x	x	x	x	x		x	x	x	x	x			x	x			
Plain-backed Sunbird		x		x	x	x	x				x	x	x	x	x	x							x	x	x	x	x	x			
Uluguru Violet-backed Sunbird				x						x	x		x	x	x		x	x				x	x	x			x	x			
Amani Sunbird				x							x																				
Clarke's Weaver				x																											
Green-headed Oriole											x																				
White-chested Alethe											x															x					
White-winged Apalis		x																													

Key: to forests: 1 = Jubba, 2 = Tana, 3 = Gede, 4 = Sokoke, 5 = Shimba, 6 = Mrima; 7 = Marenji, 8 = Gongoni, 9 = Muhaka, 10 = Buda, 11 = East Usambaras, 12 =Kilulu, 13 = Gendagenda, 14 = Msubugwe, 15 = Kiono (Zaraninge), 16 = Pande, 17 = Pugu, 18 = Kazimzumbwe, 19 = Vikindu, 20 = Kisiju, 21 = Mchungu, 22 = Kiwengoma, 23 = Litipo, 24 = Rondo, 25 = Nyangamara, 26 = Chitoa, 27 = Pindiro, 28 = Ngarama, 29 = Pemba Island, 30 = Zanzibar Island, 31 = Mafia Island

6.2.2 Level of Study Effort

Before it was possible to prioritise forests according to their ornithological value, it was necessary to consider the period of research undertaken at each site. This is important because more species tend to be discovered if a site is examined in each season of the year as some of the species are migratory, and over a number of years as some occur at very low-density.

Forests were categorised according to whether study had taken place over a prolonged period of years and for all seasons (high effort), several long visits during different seasons spread over a number of years (medium effort) or only a few brief visits over a few or only one season (low effort) (Table 6).

Table 6: **Coastal Forests categorised by effort and rarity scores (rarity scores explained in Table 4)**

HIGH EFFORT	TOTAL RARITY SCORE	MEDIUM EFFORT	TOTAL RARITY SCORE	LOW EFFORT	TOTAL RARITY SCORE
Arabuko-Sokoke FR	29	East Usambaras	35	Mkongani N & W FR	22
Pugu FR	18	Rondo FR	23	Mrima FR	13
Gede NM	12	Witu FR	20	Gendagenda FR	13
Rusitu BR	1	Tana River Delta and Gallery Forest	18	Shimba Hills NR	12
		Kiono FR	16	Pindiro FR	11
		Kazimzumbwe FR	15	Chitoa FR	11
		Litipo FR	15	Kiwengoma FR	10
		Ngarama FR	13	Kilulu FR	10
		Jozani FR	9	Pande FR	9
		Mkulumuzi FR	1	Msubugwe FR	8
				Maluganji FR	7
				Vikindu FR	7
				Boni NR	6
				Diani	5
				Shimoni	5
				Mtapwa FR	5
				Shoonto	4
				Mchungu FR	2
				Mafia	2
				Kisiju	1
				Nyangarama	1
				Haroni BR	1

Key: FR = Forest Reserve, NM = National Monument, NR = National Reserve, BR = Botanical Reserve, no acronyms = no status.

For location of forests, see Figures 3-7, and Appendix 4.

This table shows that few forests have been studied intensively. However, certain forests, whether or not they have been intensively studied, have high rarity scores. The rarity score is a measure of importance for bird conservation, and allows the forests to be put into priority order for conservation action.

6.2.3 Prioritisation of Coastal Forests

Based on the rarity scores and degree of effort expended in each forest as listed in Table 6, it has been possible to group forests based on their ornithological importance (Table 7).

Table 7: **Ornithological importance of Coastal Forests in eastern Africa**

HIGH (over 20 rarity score)	**MEDIUM** (10-19 rarity score)	**LOW** (0-9 rarity score)
East Usambaras	Kiono FR	Jozani FR
Arabuko-Sokoke FR	Tana River	Mkulumuzi
Mkongani N & W FR	Pugu FR	Pande FR
Rondo FR	Kazimzumbwe FR	Shoonto
Witu FR	Litipo FR	Boni NR
	Mrima FR	Diani
	Gendagenda N & S FR	Maluganji FR
	Pindiro FR	Shimoni
	Chitoa FR	Mtapwa
	Kiwengoma FR	Vikindu FR
	Kilulu	Mchungu FR
	Gede	Mafia
	Ngarama	Msubugwe FR
	Shimba Hills	Nyangarama
		Rusitu BR
		Haroni BR

The majority of the larger Coastal Forest sites have been surveyed for birds in Tanzania and Kenya (e.g. Burgess & Mlingwa, 1993; Eriksen *et al.*, 1993), hence the list of priorities for those countries will probably not change significantly with further survey work. The birds of the Coastal Forests in central and southern Mozambique are known from the work of Clancy (1971), but were not considered at the Workshop due to uncertainty about the status of many of these forests. The bird fauna of the Coastal Forests in the northern part of Mozambique is unknown. It is possible that birds presently thought to be rare endemics of the Coastal Forests in Tanzania and Kenya are present in northern Mozambique. Ornithological study of the Coastal Forests of northern Mozambique is a high priority when the security situation permits this.

It has been recently argued (ICBP, 1992) that the importance of a forest site for birds also indicates the overall importance of an area for biodiversity conservation. If this is the case, then the Coastal Forests in the 'High Importance' column of Table 6 may be the overall priorities for biodiversity conservation in this forest type.

6.2.4 Conclusions

• The most important Coastal Forests for bird conservation are the East Usambaras, Arabuko-Sokoke, Mkongani, Rondo and Witu. It is important that serious efforts are made to conserve these areas.

• Most of the Coastal Forests in Somalia, Kenya, Tanzania and southern Mozambique have received some ornithological study. However, there are still a few large forests, and many small ones, which need investigation. This is particularly true in northern Mozambique.

• The six endemic bird species in the Coastal Forests are not found in every forest and some of the species are absent from most Coastal Forests. The features in the forest (biological,

structural, geographical of physical) which influence whether or not a particular species of bird will be present at a particular forest are not known.

6.2.5 Research priorities

On consideration of species endemism, their rarity scores and the degree of research effort expended in the Coastal Forests of eastern Africa, the following research priorities were agreed:

1. To construct a full list of forests still to be surveyed, and ensure that these are surveyed within the next three years.

2. To extend basic surveys to include:

    a) visits in at least two seasons (breeding and non-breeding), plus the migration season if possible.

    b) an assessment of the relationship of bird data to measures of disturbance, damage and forest structure.

    c) intensive efforts to find key taxa e.g. tape playback of bird calls to elicit responses.

3. To examine the distribution of rare and endemic species within the Coastal Forests in relation to the habitat-features of the forests in which they live.

6.3 IMPORTANCE OF THE COASTAL FORESTS FOR MAMMALS, REPTILES, AMPHIBIANS AND INVERTEBRATES

The participants at the Workshop were able to make considerable progress towards defining the species of mammals, reptiles & amphibians which are endemic or near-endemic to the Coastal Forests. However, this must be regarded as a provisional exercise as the data are poor for most groups, and many forests have not been studied adequately. For the invertebrates data were regarded as too preliminary, even for the butterflies, to allow the Coastal Forests of particular importance for invertebrates to be defined.

6.3.1 Mammals

Data on the mammals of the Coastal Forests has been derived from published material (e.g. Moreau & Pakenham, 1941; Ansell & Dowsett, 1988; Smithers & Tello, 1976; Smithers & Wilson, 1979; Smithers, 1983), and the knowledge of the participants at the Workshop.

a) Coastal Forest endemic species

There are five species of mammal which are endemic to the Coastal Forest. These are: Golden-rumped Elephant Shrew (*Rhynchocyon chrysopygus*) (see FitzGibbon, 1994), Aders's Duiker (*Cephalophus adersi*) (see Davies *et al.*, 1992), African Woolly Bat (*Kerivoula africana*), Pemba Fruit Bat (*Pteropus voeltzkowi.*) and the bat species *Rhinolophus deckenii* . One additional species is a Coastal Forest endemic if the taxonomy of Corbet and Hill (1991) is accepted; this is the Zanzibar Red Colobus (*Colobus kirkii*). Recent collections of mammals from the Tanzanian Coastal Forests also include a number of species which cannot be identified by expert taxonomists and which, therefore, are regarded as potential new species. Of these, there are perhaps four species of shrew, one species of

bat, one or two species of bush-baby, and one species of rodent. These may all turn out to be Coastal Forest endemic species.

Two species of monkey in the Tana river forests in Kenya,*Cercocebus galeritus* and *Procolobus rufomitratus* are endemic to that area. These species are of interest as many authorities regard these riverine forests as part of the Coastal Forest area.

b) Coastal Forest and Eastern Arc Mountains endemics

A further group of species are found only in the Coastal Forests and the Eastern Arc mountain forests, especially the lowlands. This includes two species of bat, *Myonycteris relicta* and *Tardarida brachyptera* , Black and Rufous Elephant Shrew (*Rhynchocyon petersi*), Zanzibar Bush-baby (*Galagoides zanzibaricus*). These species may be common in the Coastal Forests, but rare to uncommon in the Eastern Arc forests (e.g. Black & Rufous Elephant Shrew), or the opposite situation may exist.

c) Rare species found in the Coastal Forests and elsewhere

The Lesser Pouched Rat (*Beamys hindei*), is a rare species which is known from a few Coastal Forests in Kenya and Tanzania, and in forests of southern Tanzania and Malawi (FitzGibbon *et al.*, in press.). Until recently it was regarded as one of the rarest rodents in Africa, but has recently been found to be more widely distributed than previously thought and is often common at the sites where it does occur. Several Coastal Forests are important for this species.

The Eastern Tree Hyrax (*Dendrohyrax validus*) is also confined to eastern Tanzania and Kenya, but is found in the Kilimanjaro forests as well as Eastern Arc and Coastal Forests.

On Mafia Island in Tanzania there is also a population of the Seychelles Fruit Bat (*Pteropus seychellensis*) which has a small global population confined to a few Indian Ocean islands.

The African Elephant *(Loxodonta africana)* is also regarded by many authorities as in danger of extinction. Elephant populations are known from at least 10 Coastal Forests sites in Kenya and Tanzania and at the Shimba Hills they are numerous.

The highly threatened Black Rhinoceros *(Diceros bicornis)* was until the early 1980s found in many of the more remote parts of the Tanzania coast, especially to the south. A few Black Rhino may still exist in some of the Coastal Forest/thicket areas in southern Tanzania.

The endemic and near-endemic species of mammals in the Coastal Forests, with their associated threat score and an outline of their distribution are presented in Table 8.

Due to the incomplete nature of the studies on Coastal Forest mammals it was not possible to produce a prioritised list of the most important Coastal Forests for mammal conservation. However, the preliminary studies indicate that the Arabuko-Sokoke forest in Kenya, the lowland forests of the East Usambara Mountains in Tanzania, the Jozani forest on Zanzibar and the Rondo Plateau in southern Tanzania are all highly important for mammal conservation.

Table 8: **Endemic and near-endemic mammal species in Coastal Forests, with a provisional assessment of their known localities (Taxonomy follows Corbet & Hill, 1991)**

SPECIES	RARITY INDEX	DISTRIBUTION IN COASTAL FORESTS
Pteropus voeltzkowi (bat)	1	Pemba
P. seychellensis (bat)	2b	Mafia
Myonycteris relicta (bat)	3b	Kiwengoma, Ruvu South, Mkwaja, Gendagenda, Shimba Hills, Zaraninge, Tongwe, Kilulu, Haroni-Rusitu
Hipposideros commersoni (bat)	3b	Pugu, Mkulumuzi
Rhinolophus deckenii (bat)	2a	Kilulu, Tongwe, Tong'omba
Rhinolophus sp. nov. (bat)	2b	Mkulumuzi (Amboni)
Kerivoula africana (bat)	2a	Gendagenda, Pangani Falls & 4 other localities on coastal islands
Tadarida brachyptera (bat)	3b	Kiwengoma
Cercocebus galeritus (monkey)	1	Tana River
Procolobus rufomitratus (monkey)	1	Tana River
Colobus kirkii (monkey)	1	Jozani
Galagoides zanzibaricus (bush-baby)	3b	Haroni, Rusitu, Amatongas, Dondo, others in Tanzania
Galago sp. nov. (bush-baby)	2a	Rondo
Bdeogale crassicauda (mongoose)	3b	Kilulu, Shimba Hills, Arabuko Sokoke, Pindiro, East Usambaras
Beamys hindei (rodent)	3b	Ruvu South, Arabuko-Sokoke, E. Usambaras, Rondo Plateau, Litipo, Kiono, Matumbi Hills
Cephalophus adersi (duiker)	2a	Arabuko Sokoke, Zanzibar
Dendrohydrax validus (tree hyrax)	3b	E. Usambara lowlands, Zanzibar, Pemba
Rhynchocyon petersi (elephant shrew)	3b	Pugu, Kazimzumbwe, Ruvu South, East Usambaras, Shimba Hills, Mafia Island, Rondo, Litipo, Chitoa, Pindiro, Ngarama
Rhynchocyon chrysopygus (elephant shrew)	2a	Arabuko Sokoke, Gede, Kenyan Kaya forests

Key: "Rarity Scores" used are:

1. -to date known from only this site in the world
2. -known from 2-5 sites
   - 2a -these are all Coastal Forests
   - 2b -these are not all Coastal Forests
3. -known from 6-15 sites
   - 3a -these are all Coastal Forests
   - 3b -these are not all Coastal Forests
4. -known from >15 sites but restricted to Coastal Forests

6.3.2 Reptiles

The Workshop was also able to review most available data on the reptiles of the Coastal Forests, except for the recent work undertaken by the KIFCON programme in Kenya. However, even in the better-studied areas the available data were quite incomplete. In Tanzania, the only Coastal Forest sites where even preliminary reptile species-lists are available are an area of woodland and thicket at Kibaha and Pugu Forest Reserve near Dar es Salaam. In Kenya, a preliminary list of reptiles exists from the earlier part of this century, based on a collection made by J.H.A. Turner in 1932. The collections of reptiles from the Coastal Forests of Tanzania made by the Frontier-Tanzania Coastal Forest Research Programme have increased knowledge of the Tanzanian Coastal Forest reptile fauna from that previously published (e.g. Loveridge, 1957; Broadley & Howell, 1991; Howell, 1993). These data, and those from the Bazaruto Archipelago of Mozambique (Broadley, 1990; 1992), the forests of Malawi (Stevens, 1974) and of Zimbabwe (Broadley, unpublished), were used at the Workshop. Data on the reptiles of the Coastal Forests are more fully presented in Broadley & Howell (in prep.).

a) Endemic and near-endemic species

The Coastal Forests of eastern Africa contain a number of endemic and near-endemic reptile species (Table 9; Howell, 1993; Broadley, 1993 1994; unpublished data; Pasteur, in press). Some of the more significant reptile groups in the Coastal Forests are described in more detail below.

Geckos

There are a number of Coastal Forest endemic species in the genus *Lygodactylus* . For example, *Lygodactylus* sp. nov. A is being described from material collected by Frontier-Tanzania in the Kilulu, Zaraninge and Kiwengoma Forests (Pasteur, in press). Three other species are known only from single localities, *L. williamsi* from Kimboza Forest in Tanzania, *L. rex* from the Ruo Gorge in Malawi, and *L.* sp. nov. B, which is being described from the Amboni Caves Forest near Tanga in Tanzania (Pasteur in press). A further Coastal Forest species, *L. howelli* was described from Jozani Forest on Zanzibar Island and has since been recorded from Mafia Island and also from Kilulu, Zaraninge, Kiwengoma, Tong'omba and Namakutwa forests on the mainland of Tanzania. Recent taxonomic revisions have altered the name of this species to *L. viscatus* (Vaillant).

Three new species of *Lygodactylus* have been discovered in the past five years (all from Tanzania). This suggests that there may be more species to be discovered in the Coastal Forests, especially in poorly collected areas such as northern Mozambique.

Since 1989, a number of species of *Lygodactylus,* which were previously thought to be confined to the Eastern Arc Mountains, have also been discovered in the Coastal Forests. These are *L. conradti* which was known only from the Usambara Mountains, but has now been recorded from Kilulu forests further east, and *L. uluguruensis* which was described from the Uluguru Mountains and has now been found in Tongwe Forest in north-east Tanzania.

Similar patterns are found in the genus *Cnemaspis.* One species, *Cnemaspis barbouri* was described from the Uluguru Mountains in 1986, but has now been recorded from the Amboni Caves and Tongwe Coastal Forests. Another species, *Cnemaspis uzungwae* was described in 1986 from the Udzungwa Mountains, but has now been found in the Kiwengoma and Tong'omba Coastal Forests in Tanzania.

Table 9: **Endemic & Near-endemic species of Reptiles in the Coastal Forests**

SPECIES	RARITY INDEX	DISTRIBUTION IN COASTAL FORESTS
Lygodactylus uluguruensis	2b	Tongwe
L. conradti "	2b	Kambai
*L. sp. nov. A** "	2a	Kilulu, Zaraninge, Kiwengoma, Amani
L. rex "	1	Ruo Gorge Forest
L. viscatus "	3a	Jozani, Mafia, Kilulu, Zaraninge, Kiwengoma, Tong'omba, Namakutwa
L. williamsi "	1	Kimboza
*L. sp. nov. B** "	1	Amboni Caves (Tanga Limestone)
Urocotyledon wolterstorffi	2b	Usambara, "Tanga", Uluguru
Cnemaspis barbouri	2b	Amboni Caves, Tongwe
C. uzungwae	2b	Kiwengoma, Tong'omba
Bradypodion tenue	2a	Shimba Hills, East Usambaras
B. mlanjense	1	Ruo Gorge/S. Mulanje, Malawi
Rhampholeon platyceps	1	Ruo Gorge
R. chapmani	1	Malawi Hills
R. kersteni kersteni	2a	Gendagenda, Coastal Kenya
R. brevicaudatus	3b	Tongwe, Zaraninge, Pugu, Kazimzumbwe, Ruvu South, Kiwengoma, Tong'omba, Rondo, E. Usambaras
R. brachyurus	3b	Kiwengoma, N. Mozambique, S. Malawi
Sepsina tetradactyla	3b	Kiwengoma, Rondo, S. Mulanje
Scelotes duttoni	1	Benguerua Island
Scelotes insularis	2a	Bazaruto Archipelago
Melanoseps ater ater	2b	Ruo Gorge
M. rondoensis	1	Rondo
M. loveridgei	3b	Kiwengoma
*Scolecoseps sp. nov.****	1	Litipo
Mabuya boulengeri	4	Tong'omba, S. Mulanje, Dondo, Haroni, Rusitu
Lygosoma lanceolatum	2b	Bazaruto Archipelago
*L. mafianum **	2a	Kisiju, Mafia
L. pembanum	2b	Pemba, Arabuko-Sokoke
Holaspis guentheri laevis	3b	Zaraninge, Ruo Gorge, Inhamitanga, E. Gorongosa, Amatongas, Dondo, E. Usambaras
Gasteropholis prasina	2a	Arabuko-Sokoke, Tanga, Kiono
G. vittata	2a	Mkwaja, Tanga, south to Lumbo
Typhlops rondoensis	1	Rondo
Rhinotyphlops lumbriciformis	2a	Arabuko-Sokoke, Tanga, Zanzibar
*Leptotyphlops sp. nov. ****	2a	Gede, E. Usambara, Mkwaja, Mchungu
Aparallactus guentheri	3b	Haroni, Kenya coast, Eastern Arc
A. werneri	2b	Kazimzunmbwe, Kiwengoma
A. turneri	2b	Arabuko-Sokoke, north to Lamu
Dendroaspis angusticeps	4	Arabuko-Sokoke, Pugu, Pemba, Mafia, Nkhata Bay, Dondo, Haroni, Rusitu
Natriciteres variegata sylvatica	3b	Rondo, Nkhata Bay, Ruo Gorge, Haroni, Chirinda
Prosymna janii	3b	Bazaruto Archipelago south to Maputaland
Philothamnus macrops	2a	Gendagenda, Kiwengoma, Rondo, Zanzibar
P. natalensis natalensis	3b	Dondo, Bazaruto Archipelago
Crotaphopeltis tornieri	3b	Kiwengoma
Dipsadoboa werneri	2b	E. Usambara, Tanga
D. flavida flavida	2b	Mulanje District, Malawi
D. flavida broadleyi	3b	Pugu, Kazimzumbwe, Zanzibar
D. aulica	3b	Chinhongue
Dasypeltis medici	3b	Rondo, Zanzibar, Mafia, Nkhata Bay, S. Mulanje, Rusitu, Chirinda, Bazaruto Archipelago

* Described by Georges Pasteur (in press - *Revue Suisse de Zolologie*); ** Described by Don Broadley (1994. *Tropical Zoology* 7: 217-222); *** To be described by Broadley (submitted.); **** To be described by Broadley & Wallach (in prep.)

Species in this table are from the Workshop, with some additions from Howell (1993), Broadley & Howell, (1991), Broadley (1994) & Broadley & Howell (in prep).

Key: "Rarity Scores" used are:

1.	-to date known from only this site in the world		
2.	-known from 2-5 sites	2a	-these are all Coastal Forests
		2b	-these are not all Coastal Forests
3.	-known from 6-15 sites	3a	-these are all Coastal Forests
		3b	-these are not all Coastal Forests
4.	-known from >15 sites but restricted to Coastal Forests		

Skinks

Most of the endemic species of skinks are insular forms, *Scelotes duttoni, S. insularis* and *Lygosoma lanceolatum* on the Bazaruto Archipelago in Mozambique, *L. mafianum* on Mafia and Kisiju Islands in Tanzania, *L. pembanum* on Pemba Island in Tanzania and the Arabuko-Sokoke forest in Kenya. On the mainland, *Melanoseps rondoensis* is known only from the Rondo Plateau in southern Tanzania, and a new species of *Scolecoseps* will be described from Litipo forest in southern Tanzania (Broadley, submitted).

Snakes

Four specimens of an undescribed species of worm snake (*Leptotyphlops*) have been collected in Coastal Forests of Tanzania and Kenya and are in the process of being formally described (Broadley & Wallach, in prep.).

A centipede-eating snake, *Aparallactus werneri,* previously known from the Pare, Usambara, Magrotto and Uluguru Mountains, has now been recorded from the Kazimzumbwe and Kiwengoma forests, the last locality representing a considerable southern range extension.

Tornier's Cat Snake (*Crotaphopeltis tornieri*) inhabits forests of the Eastern Arc Mountains, extending southwards to the extreme north of Malawi. It has now been collected in the Kiwengoma forest, a considerable range extension.

A further species of snake *Typhlops rondoensis* is known only from the Rondo Plateau in southern Tanzania (Howell, 1993).

b) Conclusions

• The lack of data on the reptile fauna of the Coastal Forests means that it has not been possible to prioritise the Coastal Forests in terms of their reptile species. However, it is obvious that single sites supporting an endemic species (Rondo Plateau, Litipo Forest, Amboni Caves and Kimboza Forest in Tanzania, Ruo Gorge & Malawi Hills in Malawi and Benguerua Island in Mozambique) are important for the conservation of these animals.

• The reptiles of the Coastal Forests have been poorly sampled, especially in Kenya and Mozambique. This may mean that the tentative conclusions of this Workshop will need to be dramatically revised in the future.

• Recent collections in Tanzania have found at least five new species of Coastal Forest reptile.

• The recent collections in Tanzania have also shown that species thought to be confined to the Eastern Arc mountain forests are also found in the Coastal Forests.

• There are many forests which have not been adequately collected for reptiles and it therefore seems likely that there are more unknown species or reptile to be found. This seems particularly true of southernmost Tanzania and northern Mozambique.

• Some species known from past collections have not been seen for many years, but may be Coastal Forest endemics. For example, the limbless skink *Scolecoseps acontias* (Werner) is still known only from the type specimen collected at Dar es Salaam in 1903 and *Typhlops platyrhynchus* described by Sternfeld in 1910 is still known only from three specimens from Tanga.

c) Research Priorities

Further field collecting is required in almost all forests in order to fully understand the importance of these forests for reptiles. This seems to be particularly true in Kenya. Fossorial reptiles are particularly poorly known.

6.3.3 Amphibians

The amphibian fauna of the Coastal Forests of eastern Africa has also been poorly sampled and most collection work of recent years has been carried out by the Frontier-Tanzania Coastal Forest Research Programme and the KIFCON programme in Arabuko-Sokoke forest in Kenya. This work has demonstrated new localities for several rare species and is allowing the description of a new species of ground-living toad. The key species are presented below (Table 10). These data are being written up in greater detail by Poynton (in prep.).

Table 10: **Endemic and near-endemic species of Amphibians in the Coastal Forests**

SPECIES	ENDEMISM/RARITY INDEX	DISTRIBUTION IN C. F.
Stephopaedes anotis	2a	Chirinda, Dombe
Stephopaedes sp. nov	1	Mafia (Mrora)
Stephopaedes loveridgei	2a	Rondo, Liwale, Kiwengoma,
Mertensophryne micranotis	3a	Kiwengoma, Rondo, Kilulu, Vikindu, Zanzibar, Kazimzumbwe, Pugu, Kisiju, Arabuko-Sokoke
Afrixalus sylvaticus	2a	Kwale (Kenya), Kazimzumbwe? & Kwamgumi
Leptopelis flavomaculatus	3b	Kiwengoma, Mrora, Zaraninge, Kazimzumbwe, Rondo, Ruo Gorge, Amatongas, Dombe, Dondo, Chirinda, Haroni, Lusitu
Arthroleptis affinis	2b	Rondo, Pugu
Spelaeophryne methneri	2b	Nang'oma, Mahenge
Hyperolius rubrovermiculatus	2a	Shimba Hills, others in Kenya

Key: "Rarity Scores" used are:

1. -to date known from only this site in the world
2. -known from 2-5 sites
   - 2a -these are all Coastal Forests
   - 2b -these are not all Coastal Forests
3. -known from 6-15 sites
   - 3a -these are all Coastal Forests
   - 3b -these are not all Coastal Forests
4. -known from >15 sites but restricted to Coastal Forests

The Coastal Forests are now recognised as a separate amphibian sub-region in Africa based on the presence of the distinctive genera *Stephopaedes* and *Mertensophryne*, the latter of which is endemic to the Coastal Forests.

Among the Sub-Saharan regions of Africa, the Coastal Forest area ranks fourth in terms of percentage amphibian endemism (Poynton, in prep.). Areas with higher levels of endemism are the Tropical Montane sub-region (including the Eastern Arc mountains), the West Equatorial sub-region and the South Temperate sub-region. In particular, the Eastern Arc mountains are known at present to have a greater species-diversity and higher levels of endemism than the Coastal Forest fauna (Howell, 1993), but it must be recognised that the Eastern Arc mountains are better collected than the Coastal Forests, hence the data on amphibians of the Coastal Forests must be regarded as provisional.

6.3.4 Invertebrates

Few species-lists are available for Coastal Forest invertebrates. These are almost exclusively for the larger and more obvious invertebrate groups such as butterflies, millipedes and snails. However, even for these groups, species-lists are incomplete and species new to science can be found with ease. For other groups of invertebrate extremely few data are available and no comprehensive species-lists exist for any forest.

However, despite the lack of detailed taxonomic studies it is known that there are many endemic species present in the Coastal Forests. For example, there are two endemic genera of butterflies, and around 40 endemic species in the Coastal Forests of Tanzania and Kenya. This situation is similar in the millipedes. At a single locality, Kiwengoma forest in Tanzania, collections by the Frontier-Tanzania Coastal Forest Research Programme recorded around 25 species of millipede, of which nine were new genera, and 15 new species. Such levels of endemism might be replicated in other groups of invertebrates, although there are presently few data to substantiate this possibility.

Further collection work undoubtedly discover many additional new species in these forests.

6.4 OVERALL ASSESSMENT OF COASTAL FOREST BIOLOGICAL IMPORTANCE

The overall numbers of endemic species in the Coastal Forests are summarised in Table 11.

Table 11: **Provisional assessment of endemism in the various biological groups in the Coastal Forests, in comparison with the better-known Eastern Arc Mountains of Tanzania**

BIOLOGICAL GROUPS	COASTAL FOREST ENDEMICS	EASTERN ARC ENDEMICS
PLANTS	c.400 Species	550 Species
MAMMALS	5 Species	10? Species
BIRDS	5 Species	26 Species
REPTILES	20 Species	27 Species
FROGS	5 Species	30 Species
BUTTERFLIES	40 Species	170 Species and Sub-species
MILLIPEDES	20 Species +	30+ Species
ROUGH TOTALS	**496 Species**	**840 Species**

Assessment of plant species from the Eastern Arc forests from Hawthorne (1993) and Lovett (1993b).
Assessment of reptile and amphibian species from the Eastern Arc forests from Howell (1993).
Assessment of mammal species from the Eastern Arc forests from Kingdon and Howell (1993).
Assessment of bird species from the Eastern Arc forests from ICBP (1992).
Assessment of butterfly species from the Eastern Arc forests from de Jong and Congdon (1993).
Assessment of millipede species from the Eastern Arc forests from Hoffman (1993).

As can be seen from the above table, which is admittedly based on provisional data in many cases, the Coastal Forests possess around 500 unique species in the groups which have been reasonably well studied.

The Eastern Arc Mountains support over 800 endemic species, which is substantially higher than the Coastal Forests. However, some of the species placed in the Eastern Arc category are also found in lowland forests at the base of these mountains and hence might be regarded as also being found in the Coastal Forests. This aspect requires further investigation and clarification.

The Eastern Arc Mountains are known to be one of two or three most important areas for species endemism in the whole of Africa (Stuart *et al.*, 1990). Hence the endemism levels in the Coastal Forests would still rank these forests as some of the most important areas for biodiversity conservation on the African continent. There is also double the area of forest in the Eastern Arc when compared with the Coastal Forests, and much greater altitudinal variation, hence higher numbers of endemic species would be expected.

It has not been possible to produce an overall ranking of the various Coastal Forests in terms of the species they possess, because many of the forests have been studied for only a few groups of animals and plants, and not for comparable periods of time. The best studied biological groups in the Coastal Forests are the plants and the birds. In Kenya a detailed investigation of the plants has allowed some ranking of the forests in terms of plants to be developed, although this system has not been published. This shows that many forests, even some of the smallest are very important for the conservation of rare plant species. Good collections of plants have also been made in most of the Tanzanian forests, but these data have yet to be analysed in terms of their levels of endemism and presence of rare species. Thus an agreed system for drawing out conservation priorities from the plant data was not available. For the birds, rather fewer of the forests have been studied, but for those that have it is easier to assess the conservation significance of the individual forests against standard criteria. The ranking of the forests in terms of their birds is presented earlier.

Using the data in this report, a provisional estimate of the 10 most important forests for biodiversity conservation in Kenya and Tanzania (the only countries with reasonable data) has been made as follows:

KENYA: Arabuko-Sokoke, Shimba Hills, Tana River, Witu, Mkongani, Longmangadi, Mrima, Malunganji, Boni, Gede

TANZANIA: East Usambaras, Rondo Plateau, Pugu/Kazimzumbwe, Kiwengoma, Tong'omba, Gendagenda, Tongwe, Kiono/Zaraninge, Litipo, Jozani.

It is hoped that the resources can be found to assist conservation efforts in each of these forests.

7. SOCIAL/CULTURAL & NATURAL RESOURCE VALUES

Participants at the Workshop also discussed the social and cultural issues which affect the conservation of the Coastal Forests. The findings of these discussions are presented below.

7.1 CATEGORIES AND PATTERNS OF FOREST USE

A general assessment of the types of forest use in the Coastal Forests and the effects of these uses on the long-term survival of the forests was carried out at the Workshop (Table 12). This clearly shows which activities are currently sustainable in the Coastal Forests due to the low rate at which they are being carried out and those which are currently unsustainable. It also provides information on which people usually undertake the activity and whether it is normally commercial or non-commercial in nature. Such facts are important when management decisions are being made over the future of a particular Coastal Forest.

Table 12: **Types of forest use related to gender of user, seasonality and sustainability with respect to conserving the Coastal Forest habitat**

USE	1	2	3	4	5	6
Timber	Sp	M	H	C	S	NS
Charcoal	Sp	M	H	C	Y	NS
Fuel Wood	G	F	H	C	Y	NS
Building Poles	G	M	H	C/D	S	NS
Wood Carving	Sp	M	H/L	C/D	Y	NS/S
Medicinal Plants	Sp	F/M	L	C/D	Y	S/NS
Edible Wild Plants	G/Sp	F	L	D	S	S
Hunting	Sp	M	H/L	D	S/Y	S?
Bee Keeping	Sp	M	L	D	S	S
Water Collection	G	F	-	D	Y	S
Cultural Sites	Sp	M/F	-	D	S/Y	S
Tourism	Sp	M/F	L/H	C	S	S
Agricultural Clearance	G/Sp	M/F	H	C/D	S	NS
Building Sites	Sp	M	H	C	Y	NS
Mining	Sp	M	H	C	Y	NS
Grazing (*)	Sp	M/F	L	D	S	S
Conservation/Research	Sp	M/F	L	C/D	S/Y	S
Education	Sp	M/F	L	D	S	S
Plantations	Sp	M	H	C	Y	NS

KEY:

1. Who does activity (SP= specialist user, G = generalist user/whole community)
2. Gender of those doing activity (M = male, F = female)
3. Volume of material generated by activity (H = high, L = low, - = not applicable)
4. Commercial basis of activity (C = commercial, D = domestic)
5. Seasonality of activity (S = seasonal, Y = year-round)
6. Sustainability of activity (S = sustainable, NS = non-sustainable)

(*) Not generally encountered in Coastal Forests

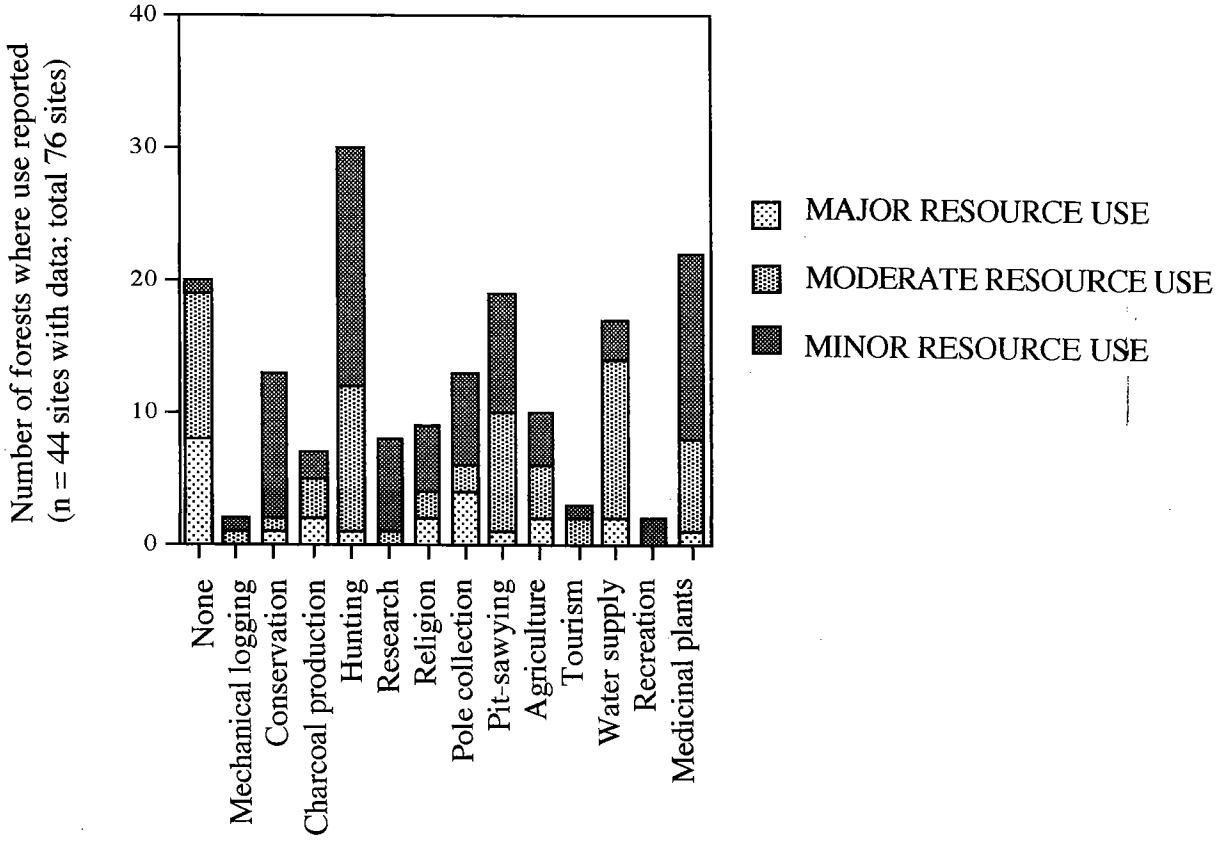
Data submitted by delegates prior to the Workshop were also used to assess the uses of and threats to the Coastal Forests (Appendices 6 & 7). The information received was mostly

from Kenya and Tanzania and may also be biased according to the perceptions of the people who completed the forms.

7.2 USES OF COASTAL FORESTS

Figures 9 & 10 presents the reported uses of the Coastal Forests of Tanzania and Kenya, as provided by the Workshop participants (data in Appendix 6). The figures are compiled using data from a sample of just over half the known forests in Tanzania (57%) and nearly three quarters of the 'forests' in Kenya (72%).

FIGURE 9: USE OF COASTAL FORESTS IN TANZANIA



Sustainable uses.

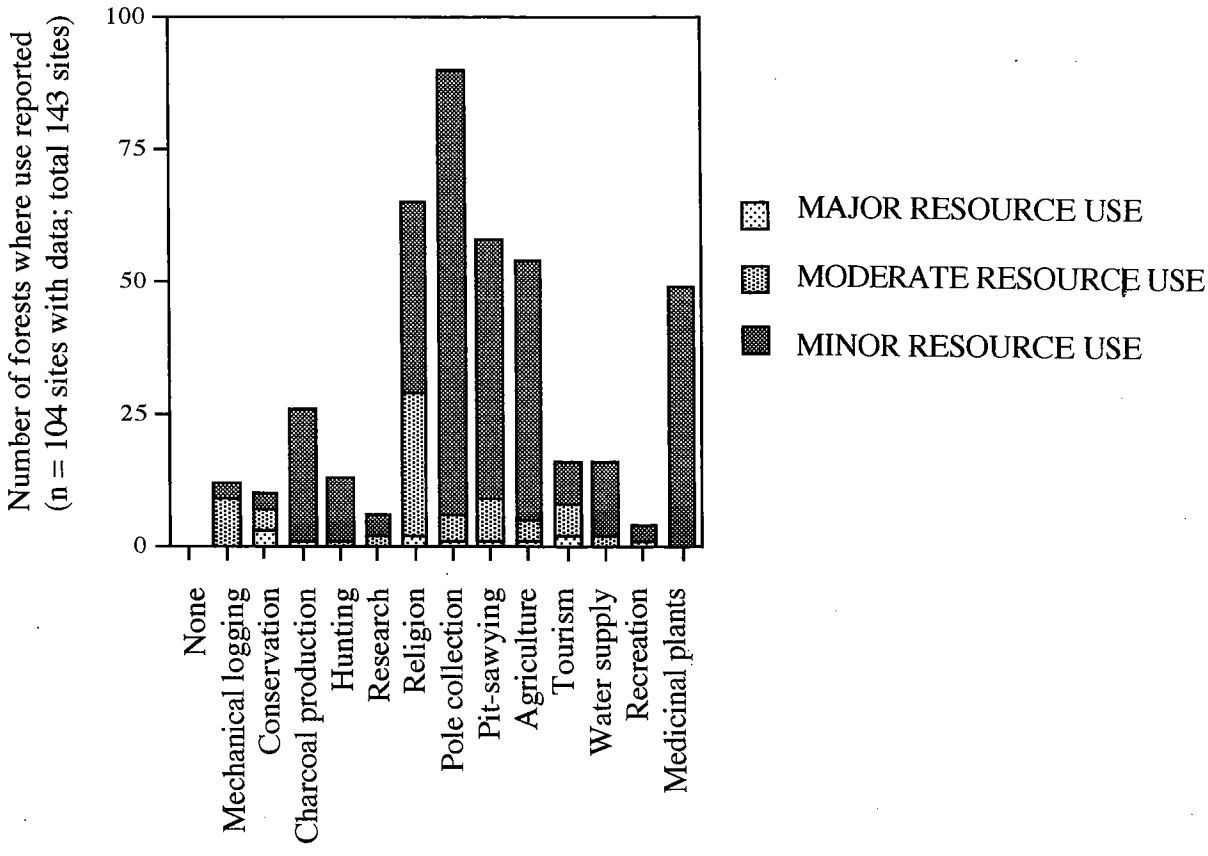
In Tanzania, the most commonly reported sustainable uses of the Coastal Forests (reported at more than 10 sites) are medicinal plants, 'none', water supply, conservation, and religion. Other sustainable uses reported at a lower frequency are research, tourism & recreation. Most of these sustainable uses are reported as being undertaken to a 'minor' or 'moderate' extent in the forests where data were provided. One exception is the category 'none' which was the major use reported in eight sites within this category.

Further sustainable uses, which were not specifically mentioned on the questionnaire, but which were reported by the Workshop participants, include the collection of edible plants, and honey from the forests.

Non-sustainable uses.

The Coastal Forests of Tanzania are subject to a number of non-sustainable uses. The most commonly reported of these are: hunting, pit-sawying, poles, agriculture, charcoal and mechanical logging. Most of these uses were also described as being undertaken at a 'minor' or 'moderate' level in the forests concerned.

FIGURE 10: USE OF COASTAL FORESTS IN KENYA



Sustainable Uses:

The most commonly reported sustainable uses in the Coastal Forests of Kenya are: religion, medicinal plants, tourism, water supply, research and recreation. Religion is reported in over 60 sites from a total of 85 where data were provided. The high level of religious use is related to the fact that many of the forested areas in Kenya either are entirely, or contain, sacred 'kaya' forest patches. The sustainable use 'none' was not reported in Kenya owing to the fact that the compiler of the data from Kenya believed that every forest was used by the local people and others from outside. This is probably more accurate than the higher 'none' use described in Tanzania which probably represents a poorer understanding of the local populations than in Kenya.

Non-Sustainable uses:

The most frequently reported non-sustainable uses of Coastal Forests in Kenya are: pole collection for local housing, pit-sawying for timber, agriculture for food-production, charcoal production for cooking, hunting of animals for food and mechanical logging for timber. Pole collection and pit-sawying are by far the most frequent uses reported.

Other non-sustainable uses which are reported from a lower number of sites are conversion of Coastal Forest into plantations of exotic trees (e.g. pines and eucalyptus), mining and building hotels and other large developments (mainly for tourists in Kenya).

Most of the non-sustainable uses in both Tanzania and Kenya involve the cutting and removal of woody plants from the forests. Removal of canopy trees reduces the forest to thicket, a state which allows relatively easy access for farmers who can clear the remaining vegetation for agriculture. This process has led to the total loss of forest from some Forest Reserves in Tanzania, particularly around the urban centres of Dar es Salaam and Tanga. These reserves have been de-gazetted and now look the same as other farmed areas. Any unique species these areas may once have supported have been lost. The effects of pole cutting on two Coastal Forests near Dar es Salaam has been reported by Hall & Rodgers (1986).

The minor reported role of plantations in the Coastal Forests of Tanzania and Kenya is of interest. In both these countries there was, until recently, a policy to replace areas of Coastal Forest with exotic species of trees for the production of timber and fuel-wood. Financial constraints, failure of most plantations and changes in Forestry policy in these two countries have meant that many of these plantations have fallen into dereliction and are now overgrown with native species. Since few, if any, plantations are currently being set up, this use is now only reported to a small extent.

Agricultural use of the Coastal Forests is highly destructive as forest vegetation is totally removed and is unlikely to grow back once farmers have moved into an area. Most Forest Reserves currently have some agricultural encroachment from people seeking additional farmland, but this is only a minor problem in most places. However, this use could become much more widespread because the population is continuing to expand along the coast and the ability of the Forestry Division to control the use of Forest Reserves remains low. The conversion to agriculture of the Kaya forests in Kenya is already a very serious problem causing the loss of whole sites and major encroachment into others.

7.3 THREATS TO COASTAL FORESTS

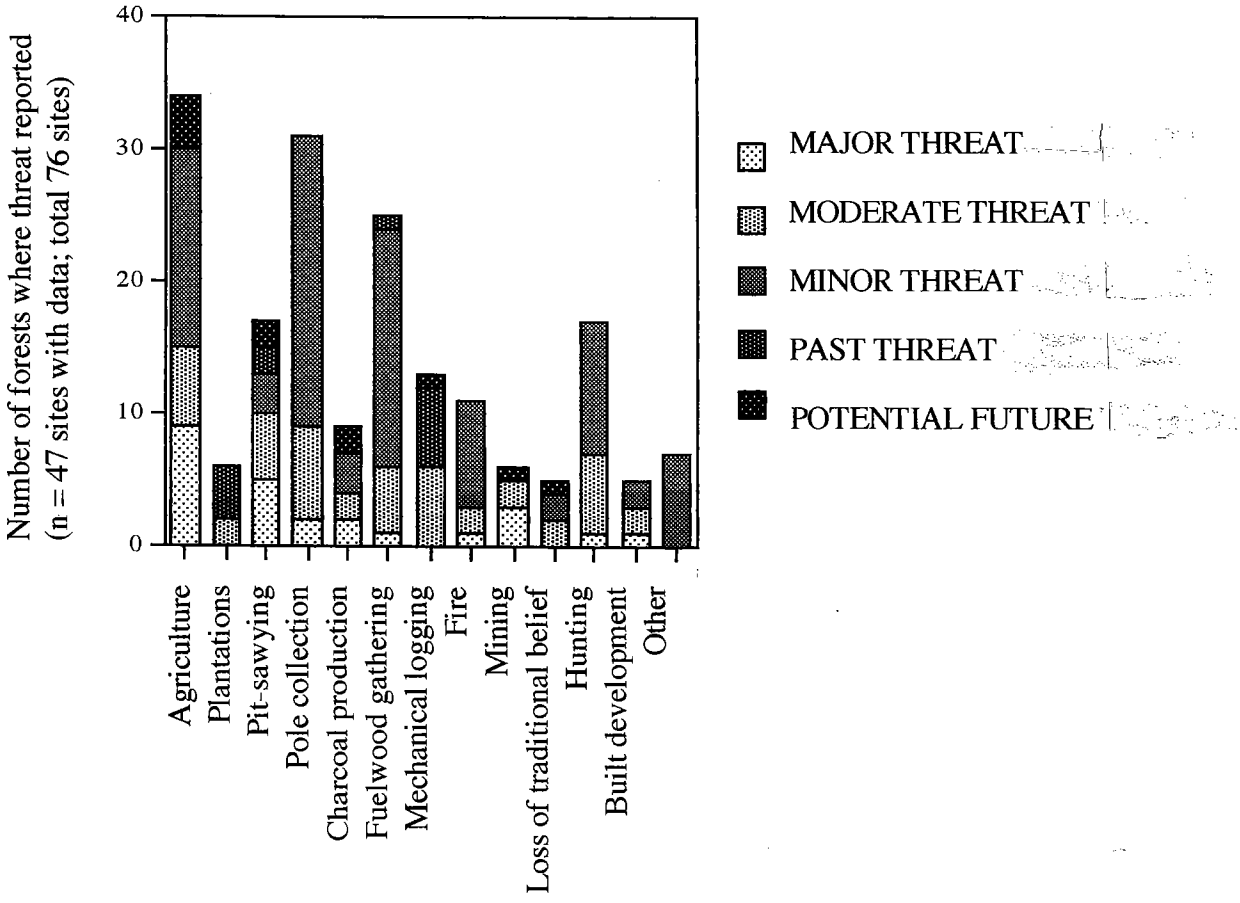
Data on the threats reported to 62% of the Coastal Forests in Tanzania and 67% of the Coastal Forests in Kenya (Appendix 7) have been summarised in Figures 11 & 12. It was hoped that these data would show if there are any general patterns of threat in the Coastal Forests which might have a common cause and hence, perhaps, a common solution.

Figure 11 shows that for the Tanzanian forests several of the threats are reported from more than 20 individual forests: agriculture, pole collecting and fuel-wood gathering. Threats reported from more than 10 sites were pit-sawying, mechanical logging, fire and hunting. Most of the threats reported to individual sites were placed in the 'minor' or 'moderate' significance categories. The threat which was reported to affect the greatest number of sites in a 'major' way was agriculture which was said to be a 'major' threat at 9 sites.

The inclusion of data on 'past' and 'future' threats shows that the main threats which were reported as 'past' were mechanical logging, plantations of exotic species within the forest, and pit-sawing. Logging and pit-sawing are less significant than they were because there are few timber trees left in these forests, and plantations are less of a threat because they were not

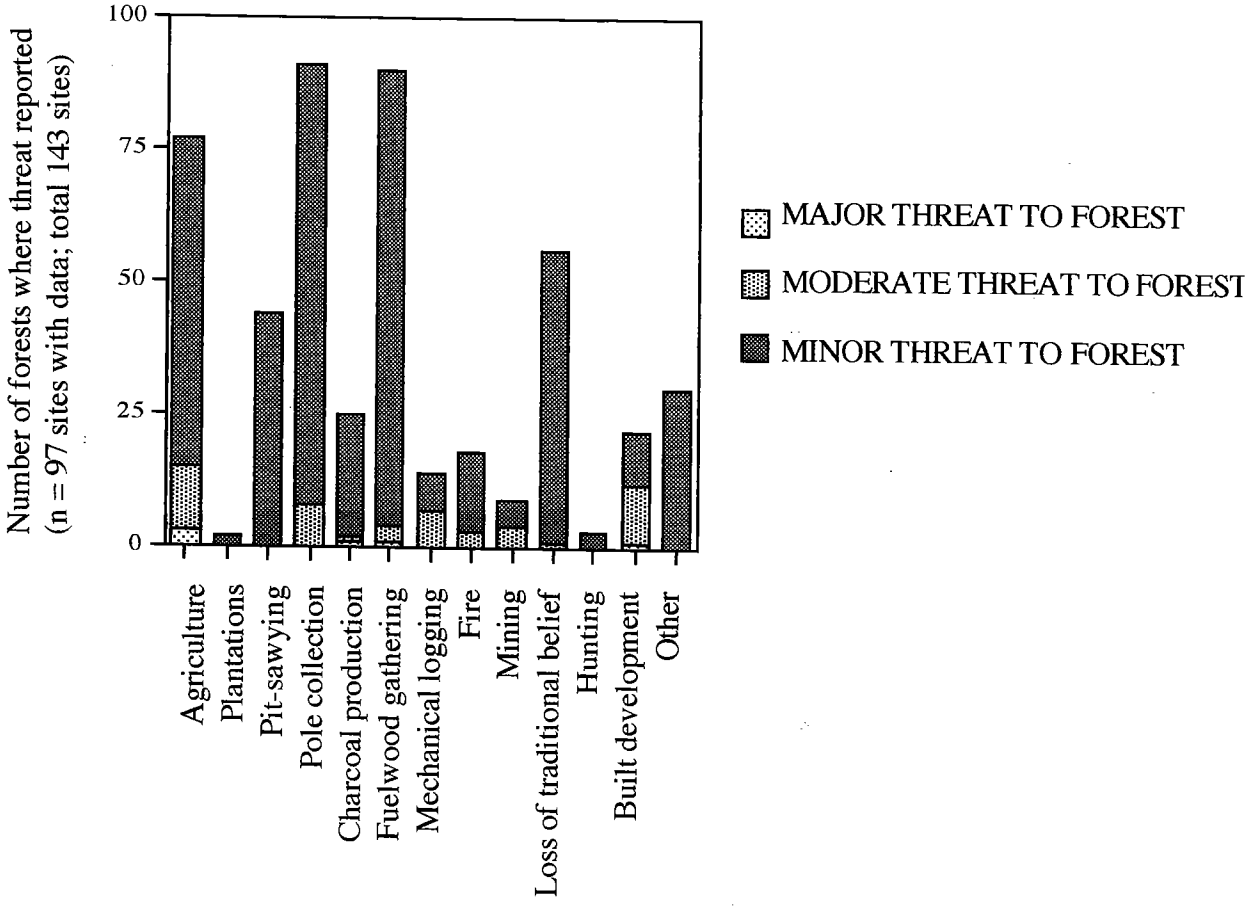
particularly successful and are no-longer official Forestry Division policy. The 'future' threats to the Coastal Forests of Tanzania were stated to be agriculture, charcoal production, pit-sawing, mechanical logging, fuelwood gathering, mining and loss of traditional belief. Conversion to agriculture was seen as the single most important potential future threat to these forests. This is largely because it seems inevitable that the rural population will continue to grow and will thus require additional land to grow the food to sustain itself.

FIGURE 11: THREATS TO COASTAL FORESTS IN TANZANIA



In Kenya the most frequently reported threats (more than 50 individual forests each) were pole collection, fuel-wood gathering, conversion to agriculture and loss of traditional belief. However, at most sites these were only reported to threaten the site to a 'minor' extent. Agriculture was reported to threaten the largest number of sites in a 'major' way.

FIGURE 12: THREATS TO COASTAL FORESTS IN KENYA



Taking the data from Tanzania and Kenya together it appears that conversion of forest to agriculture is the most important threat to the Coastal Forests. This is further supported by data provided on the land-use surrounding the forests; this was said to be agriculture for nearly all sites. With an increasing population in the coastal area of eastern Africa the demand for further farmland will undoubtedly increase. This will cause the remaining areas of Coastal Forest to come under increased pressure to provide land for farming. This threat will be especially pronounced in forests which have no form of legal protection. Indeed such forest has largely disappeared already because it has been converted to agriculture.

Other widespread threats to Coastal Forests in Kenya and Tanzania are logging (both pit-sawing (most) and mechanical logging (little)), pole collection, fuel-wood gathering, plantations, charcoal burning and hunting. These activities have mostly become non-sustainable because of the high and rapidly expanding coastal population, causing the demand for wood products to increase every year. Another factor is the diminishing control by government services and local people. The former due to financial problems, and the latter due to the erosion of traditional belief in sacred forests by the global religions of Christianity and Islam and by 'Western' culture and ideals.

8. CONSERVATION, POLICY AND RESEARCH

Once the value of the Coastal Forests to global biodiversity conservation had been revealed through the review of biological data, and once the serious level of threat had been confirmed, Workshop delegates attempted to agree a list of conservation, policy and research objectives designed to improve the current situation.

The priorities are outlined below.

8.1. MANAGEMENT AND CONSERVATION ACTIONS

Workshop participants recommended a number of areas where conservation and management action could improve the protection of Coastal Forests. The following actions were considered to be the most important.

1) Gazetting new areas

In some places forest vegetation exists outside demarcated Forest Reserves or other protected areas. Since so little forest remains, either within or outside reserves, it was felt important that all forest be gazetted, either as extensions to existing reserves or as entirely new ones. This was regarded as a top priority. The local community should be encouraged to support the process of gazettement.

2) Boundary marking

In many Coastal Forests within protected areas the boundaries of the protected area have not been maintained for many years, making the enforcement of protected area status difficult. The re-marking of boundaries would help prevent further illegal encroachment. Again the involvement of the local communities in this action was deemed essential.

3) Institutional support

Most Coastal Forests in eastern Africa are in Forest Reserves under the control of Forest Departments. An important means of ensuring better conservation of the sites would be to assist the Forestry Divisions in this task. Issues as diverse as lack of transportation, low wages and lack of equipment were frequently cited as obstacles to effective management and conservation of the Coastal Forests.

4) Management plans

No Coastal Forest has a fully-operational management plan, the closest to being Arabuko-Sokoke forest in Kenya. A programme to create management plans for the Coastal Forests would require considerable inputs, but should allow a much better understanding of the remaining resource and the management required. A programme to write management plans is, however, largely pointless if the plans are not followed up by an implementation stage.

The availability of forest maps is also limited, particularly at the lower levels of the Forestry Division. Available maps are usually of the Forest Reserve boundaries. These can be decades old, but are still of great value as there have been few changes to most Forest Reserves in the past 20 years. Producing and distributing maps of the more important Coastal Forests would be a valuable first step to permit their better management.

5) Training in Conservation Management

Training foresters in the principles of conservation management might assist the survival of the Coastal Forests. Lack of awareness of the biodiversity importance of Coastal Forests, together with a lack of basic resources has not helped the management of these areas. Better knowledge of practical conservation methods, such as managing tree nurseries and subsequent planting, as well as knowledge of current government policy and penalties, would increase the chances of the forest to survive.

6) Community participation and Extension Work

Local communities play a vital role in determining the success of conservation management for it is they who often rely on forest products to survive. Thus, it is important that good relationships between local people, forestry personnel and researchers are established. It may also be desirable to involve rural populations in the actual management. For example, conducting agricultural extension work to encourage farmers to grow trees on their land; inviting village leaders to act as forest guardians to monitor and report illegal forest activity; and initiating programmes of environmental education - particularly targeted towards young people and women.

7) Alternative Resources and Incentives

Alternative resources and technologies need to be provided to populations which rely on the forest for essential materials. For example, the provision of charcoal ovens (which are estimated to reduce wood consumption by 60%); setting up tree nurseries and encouraging local people to start tree plots on degraded land, with incentive payments for each mature tree produced; training in improved agricultural techniques; producing sun-dried mud bricks as an alternative to building poles and so forth.

8) Involvement of Donor Agencies and NGOs

It was considered important to strengthen the relationship between governmental and non-governmental bodies so that information gathered by conservation groups and research projects may be utilised by Forestry and Wildlife Divisions. NGOs may also provide financial support to the conservation actions of government and act as a bridge between donors and government.

9) Ecotourism

Sensitive (low key) tourism developments in at least one Coastal Forest in each country were recommended as part of a conservation education programme and to allow the public to experience being "in" the forest. Opening Coastal Forests to tourists would act to increase awareness of the importance of these forests and could provide additional revenue. It was considered important that any revenue realised must be put back into the Forest Reserve system, and/or to the local people. In Kenya the Forestry Division and the Kenyan Wildlife Service have signed a Memorandum of Understanding for the management of selected Forest Reserves, e.g. Arabuko-Sokoke. It is hoped that this will assist the development of beneficial tourism in this forest.

8.2. POLICY ISSUES

Several issues of forestry policy were thought important for the management and conservation of the remaining Coastal Forests.

1) Policy review and planning

Workshop delegates considered that a full review of management policy towards the Coastal Forests by government Forestry Divisions would be useful. This would involve reviewing the laws associated with reserves; clarifying which reserves are "productive" and which "protected" and why; producing action plans operating at District and Regional level; and where appropriate changing existing structures, laws or policies. It was agreed this was a long term process.

2) Specialist Coastal Forest function

Workshop delegates recommended the setting up of a separate section within Forestry Divisions in eastern African countries which would be committed to the fate of Coastal Forests. The proposed section would be similar to the Catchment Forestry function operating in Tanzania and Kenya. An individual section would allow the concentration of capital and human resources in an area of forestry which has suffered neglect in the past, and which is capable of attracting external funding.

3) De-gazettement

It was considered that measures should be taken to make the de-gazettement of reserves more difficult. At some sites, the natural forest has completely disappeared and the land remaining is very degraded. In this instance, the establishment of plantations would be a suitable use of the land. If, however, valuable land is not totally degraded, it should be allowed to regenerate to thicket and forest. The moral problems associated with invasion of government land by agriculturists was recognised.

4) Biodiversity policy

It was felt that sections on the biodiversity values of named Forest Reserves should be incorporated into National and Regional Forestry Action Plans.

5) Penalties and Law Enforcement

The penalties which have been set to control illegal forest practices were litigated decades ago and are now out-of-date and unrealistic. For example, logging licences are extremely cheap and many loggers avoid purchasing one at all. Much of the revenue obtained through licences, taxation and fines is not declared, thus contributing to the lack of resources available for forest management. These loopholes require tightening if legal measures are to be in any way effective.

It was also acknowledged that there are conflicts between these issues and the involvement of local people in forest management. This can be reduced if the local people are also involved in drawing up and implementing the penalties and laws, and if they benefit from an improved system of management.

7) Feedback between Policy Makers and Managers

It was felt that in some cases policy had been laid down without regard to the real problems associated with conservation management. In some cases local people and government officials were found to be unaware of the correct policy. This situation could be reversed by improved information flow within the Forestry Division and other parts of government.

8) Staff conditions of service

Throughout the Forestry Divisions of eastern Africa the economic conditions of the countries concerned do not allow the government's forestry workers to receive a salary which fully covers their needs. Forestry workers are frequently forced to seek additional employment, or to generate income directly from the forest resource they have been appointed to manage. Delays in the payment of salaries sometimes occur and reports have been received of workers in remote areas going for several months without wages. Such problems strongly hinder Forestry Division action to conserve forests.

9) Restructuring of Forestry Divisions

In Tanzania, devolution of power occurred in the early 1970s and has resulted in problems for forest management. Currently, the Regional Forestry Department reports to the Regional Development Director and from there to the Office of the Prime Minister in Dar es Salaam. In comparison, the Catchment Forestry office in each Region reports directly to the Forestry Division in Dar es Salaam. Insufficient communication between different government offices often leads to confusion and hinders the formulation and application of a single coherent forestry policy. A review of current national forestry management should consider whether better conservation might be achieved by adopting a single centralised reporting structure, with Regional Forestry Officers reporting directly to the Forestry Division in Dar es Salaam. However the existing central system of control in Kenya was criticised by Workshop participants for being too bureaucratic and hence some decentralisation to District and Regional authorities was advocated.

8.3. RESEARCH QUESTIONS

There are several areas of research in Coastal Forests which need to be tackled urgently.

1) Biological Surveys

Surveys were felt to be important as the state of knowledge is poor for most groups, and does not allow a comprehensive analysis of the most important forests for conservation. It was considered that surveys should cover the following:

a) For forest sites for which data were unavailable, preliminary surveys are necessary to establish the size, status and degree of threat to the site. Basic biological inventories also need to be undertaken at these sites, with priority groups being birds, mammals, reptiles, frogs, plants and butterflies.

b) For better-known forest sites, the largest and least protected sites should be selected and a programme of research undertaken on a seasonal basis. This was considered important because to date most research has been concentrated in the dry season when many animals are not active and most plants are neither flowering, nor fruiting.

c) Experts should be encouraged to go out into the field with trainees to develop training programmes in research techniques, species identification and practical conservation methods. This was considered important to ensure that a larger number of trained and interested people are living in eastern African countries.

2) Social/cultural surveys

There was a general feeling that the effects on the Coastal Forests of the people living around them are poorly known. There are also few data on the attitudes of the local people to these forests, what they would like to happen to the forests, and what ways they would propose that the reserve might be managed to assist forest conservation and improve their standard of

living. The only forests where any detailed work of this type has been carried out are Arabuko-Sokoke in Kenya and Pugu/Kazimzumbwe in Tanzania. The priorities for this type of research were considered to be:

a) To conduct socio-economic surveys of communities that utilise Coastal Forest resources around a number of forests. Methods must be standardised and need to assess which resources are over-utilised, where highest demand is, whether exploitation is for domestic or commercial use, and what the attitude of the people to forests and Forest Reserves actually is.

b) To study ethno-botanical aspects of economically and medicinally valuable plants, and determine how threatened these species are in the wild.

c) To research into developing realistic, appropriate and long-term solutions to non-sustainable resource uses in the Coastal Forests.

3) Forestry

The intensity of forestry research in the Coastal Forests has always been quite low and has declined dramatically in recent years. Most research has been related to the growth rates of trials of exotic and native species which have been planted on cleared Coastal Forest. Several such studies have been undertaken in the Rondo Coastal Forest in southern Tanzania. Current forestry research needs were felt to encompass the following:

a) Research into the development of techniques for the restoration of natural forest.

b) Research into the growth rates, regeneration rates and growth requirements of valuable trees in terms of timber and other features such as herbal medicines.

9. CONCLUSIONS

The conclusions presented below reflect the detailed discussions at the Workshop, although they were not agreed by the assembled delegates.

• Coastal Forests only occupy some 4000km^2 total and hence are one of the more threatened forest-types in the world.

• There are over 200 small and fragmentary Coastal Forests making up the total known area. Most are between 1-10km^2 with only a small proportion above 25km^2.

• Coastal Forests are highly important in terms of the species of plants and animals they support, many of which are endemic.

• Overall the Coastal Forests are known to support around 400 endemic species of plants, 5 endemic species of birds, 5 endemic species of mammals, 20 endemic species of reptiles, 5 endemic species of frogs and a large number of endemic invertebrate species. When remaining areas of forest are taken into consideration, these levels of endemism are comparable with some of the most biologically important areas of Africa.

• Presented north-south, the most important areas of Coastal Forests, in terms of their biodiversity significance, are believed to be: Arabuko-Sokoke area, Shimba Hills area, East Usambara lowlands, Pangani area, Kiono/Zaraninge area, Pugu/Kazimzumbwe area, forests on the Matumbi Hills, Rondo plateau and area. Insufficient data exist on the Coastal Forests of Mozambique to allow their significance to be accurately assessed.

• The larger sites appear to be the most important in terms of biodiversity importance. However, extremely small areas of forest can also support rare and even single-site endemic species of plants and small animals.

• Coastal forests have also been exploited for many years by the Colonial and Independent Forestry services and few of the remaining forests support many commercial stands of timber.

• The majority of the forests are still used by the local people for the gathering of poles, fire wood and other forest products. These are the major uses in areas away from urban centres.

• Commercial (and often illegal) exploitation of Coastal Forests, especially those close to major urban centres, continues to be focussed on the cutting of the remaining timber trees by hand using pit-sawing techniques, and the cutting of all woody vegetation over large areas for burning to produce charcoal as an urban cooking fuel.

• The lack of resources in the authorities which have control over the majority of the remaining Coastal Forests (primarily the Forestry Division) means that most activities are uncontrolled, and some, such as agricultural encroachment, are proceeding unchecked in certain sites.

• The major threat to the Coastal Forests is agricultural conversion by an expanding rural population. However other important threats were over-exploitation of wood products (timber, building poles and cooking fuel) by an expanding urban market which still relies on natural products for construction and cooking. Some of the over-exploitation of the forest resource is carried out directly by Forestry Division staff, and much is undertaken with their consent.

• Conservation measures are urgently required to address the degradation of the remaining forest resource. Such measures should include the provision of alternative resources for forest users, improved capacity by the Forestry Division and liaison between the local people and the authorities protecting the forest to try and draw up a mutually acceptable plans for forest conservation.

• Critical appraisal of the present control system of Coastal Forests lying within Forest Reserve boundaries (Tanzania) is necessary. At the present time, many reserves are controlled by local and regional government bodies rather than directly by the Forestry Division.

• The various conservation projects operating in the Coastal Forests (two in Kenya and two in Tanzania) need to communicate more regularly and exchange results so that successes and failures of research techniques and conservation measures can be more readily appreciated.

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Alex Dickinson	Frontier
Phil Clarke	Frontier
Mike Brewin	Frontier

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APPENDICES

1. Programme of Workshop
2. List of participants
3. Data-sheet distributed to participants
4. List of Coastal Forests of Eastern Africa arranged N-S
5. Table of Coastal Forests arranged by area
6. Table of Coastal Forests arranged by number, with uses shown
7. Table of Coastal Forests arranged by number, with threats shown

APPENDIX 1:

PROGRAMME OF COASTAL FORESTS WORKSHOP

DAY 1 - morning.

0900-0915 Opening address - J. Kapuya

Session 1 - Biology

0915-0935 What are Coastal Forests - A. Rodgers
0935-0955 Biological importance: plants - P. Clarke
0955-1015 Biological importance: animals - K. Howell
1015-1030 Discussion
1030-1100 Tea and soft drinks

Session 2 - Conservation issues

1100-1115 Conservation issues: human values - A. Cunningham
1115-1130 Conservation issues: Arabuko-Sokoke, Kenya - A. Githitho
1130-1145 Conservation issues: Shimba Hills, Kenya - M. Apado
1145-1200 Discussion
1200 Round-up Session - J. Kapuya

1200-1330 Lunch

DAY 1- Afternoon

1330-1345 Aims and objectives of the Workshop - J. Kapuya
1345-1350 Programme - A. Dickinson

Session 3 - Determining the priorities

1350-1410 Organisation of working groups - N. Burgess

1410-1800 Working groups
a) Forest position, area and threats
b) Botanical significance
c) Ornithological significance
d) Other animals significance: mammals, reptiles, amphibians, invertebrates
e) Social values

1800 Conclusion - J. Kapuya

DAY 2 - Morning

0900-0910	Welcome and reminder of programme	- A. Dickinson

Session 4 - Biological priorities

0910-1030	Presentation of biological priorities in each group, and the major gaps identified	
0910-0920	a) Forests	- A. Dickinson
0920-0930	b) Plants	- P. Munyunyembe
0930-0940	c) Birds	- A. Tye
0940-0955	d) Other animals	- K. Howell
1000-1030	Overview on overlap of biological priorities	- N. Burgess
1030-1100	Tea and soft drinks	

Session 5 - Uses and threats to Coastal Forests

1100-1120	Major uses of and values of Coastal Forests to Tanzania and local communities, with identification of the major research gaps	A. Cunningham
1120-1140	Major threats to and outline solutions to problems found in the Coastal Forests, and research gaps	A. Cunningham

1140-1200 Discussion

DAY 2 - Afternoon

1215-1800 Field trip to Pugu Hills - led by P. Clarke
1800-1900 Refreshments.

DAY 3 - Morning

0900 -0910	Welcome and introduction	- N. Burgess

Session 6 - Priorities for action

0910-1145	Working groups: a) biological priorities and research gaps; b) policy changes c) conservation needs	N. Burgess
1045-1115	Tea and soft drinks	
1115-1145	Data-collation	- N. Burgess/ A. Dickinson

DAY 3 - Afternoon

Session 7 - Production of proposals

1330-1600.	Discussion of policy, research and conservation needs.	- A. Dickinson
1600-1630	Tea and soft drinks.	
1630-1645	Outline of the proposals and description of what follows the Workshop	- N. Burgess/ A. Dickinson
1645-1700	Closing remarks	- Dean of Faculty of Science

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APPENDIX 3

NOTES FOR PARTICIPANTS

In order to ensure the best possible use of time at the workshop, we hope that you will be able to prepare some materials beforehand and send them to us by the end of June 1993. This will enable us to compile information before the workshop and thus hopefully make the workshop itself maximally productive.

The materials we hope you will be able to provide before the conference are:

1. A map showing the distribution of evergreen and semi-evergreen coastal forest patches in the country, or part of country, where you have most expertise (or data). We hope to have these compiled prior to the conference so that an overall map of the distribution of coastal forests in East Africa is created. Please could all maps be compiled on copies of those maps enclosed with this package, to facilitate accurate plotting of forests position and total area. Unless a site is of particular biological or other significance, could sites of less than 0.5km^2 be excluded in case they confuse the overall map.

2. For each of the sites of which you have strong personal knowledge, or considerable available data, please could you complete one of the enclosed forms so that information on status, threats, biological significance and possibilities for effective conservation action can be summarised at the workshop and an overall assessment of what is required to be done in these forests can be defined. Under the biological section please note that we are concentrating on rare and threatened species as our measure of biodiversity. We are not attempting to gather information on total biodiversity of each forest sites as these data would be both too time consuming to collate and would almost certainly reflect the study effort at sites to a great degree.

   We are asking for a lot of data from some of you (see your covering letter to see if this applies). For those of you with the greatest workload - please do the best you can in the time available to you. Where detail has to be sacrificed due to shortage of time, *please indicate where the detail has been sacrificed.* If you have any problems with the task please let us know in advance of the workshop and we may be able to assist you.

Use of Data

a) Workshop Proceedings: A short proceedings account will be written summarising the findings of the workshop, this will be circulated to all participants at the earliest possible opportunity after the completion of the workshop.

b) Chapter in book on coastal forests: The organisers of the conference are presently compiling a book on the coastal forests of East Africa, hopefully for inclusion in the IUCN Forest Programme series of books. It is hoped that the proceedings of this current workshop will provide a sound basis for a concluding chapter to this book.

c) Important Bird Areas of Africa Project: We are also hopeful that the site-based information generated at this workshop can form one of the building blocks of a major programme of the newly formed global bird conservation federation, BirdLife International, which aims to map and describe all the 'Important Bird Areas' in Africa. Similar programmes have been completed in Europe and are ongoing in the Middle East; where they have been completed they have proven an effective means of prioritising sites and promoting their conservation.

All contributors will, of course, be credited in any publication drawing on the data.

Definition of coastal forest:

For this workshop coastal forest is defined using vegetation types in 'The Vegetation of Africa' by White (1983) (Zanzibar-Inhambane Regional Mosaic - mapping unit XIII). Relevant vegetation types are *Zanzibar-Inhambane Undifferentiated forest* and *Zanzibar-Inhambane Scrub forest*. Undifferentiated and Scrub forests comprise evergreen or largely-evergreen closed canopy vegetation >8m tall (usually considerably taller), subject to a monsoonal climatic regime, and growing in soils over 1m deep over Mesozoic or post-Mesozoic rocks generally within 50km of the coast and below 600m altitude.

We have chosen to exclude the Zanzibar-Inhambane Lowland Rainforest (present at the foothills of the Eastern Arc mountains), Zanzibar-Inhambane transition woodland (*B. spiciformis* dominated), Zanzibar-Inhambane evergreen and semi-evergreen bushland and thicket, and mangrove-dominated vegetation.

Selected Bibliography

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A list of people who have been invited to the workshop is presented below.

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Juma Kapuya - University of Dar es Salaam
B.S. Kessy - Coast Region RNRO, Tanzania
Jan Kielland - Norway
Jonathon Kingdon - Oxford University, UK
Idris Kikula - University of Dar es Salaam
Dieter Kock - Senkenburg Museum, Germany
Jon Lovett - Copenhagen University, Denmark
Quentin Luke - WWF Coastal Forest Project, Kenya
Jane Madgewick - Broads Authority/Somalia Research Programme, UK
Pedro Duarte Mangue - Forestry Research Institute, Mozambique
Saidi Mbwana - Tanzanian Forestry Division
Charles Mlingwa - University of Dar es Salaam
Tom Muller - National Herbarium, Zimbabwe
Charles Msuya - University of Dar es Salaam
K.K. Murira - Director General, TAFORI
Cath Muir - Frontier-Tanzania
Paul Munyenyembe - Botany, University of Dar es Salaam
Leonard Mwasumbi - University of Dar es Salaam
Paul Nnyiti - Wildlife Conservation Society of Tanzania
Anne Robertson - National Museums of Kenya

Alan Rodgers	- GEF project manager for East Africa
Doug Sheil	- Oxford University, UK
Simon Stuart	- IUCN, Switzerland
Jonathon Timberlake	- Zimbabwe Forest Research Centre
Alan Tye	- IUCN, Usambaras Project, Tanzania
Edward Waiyaki	- National Museums of Kenya
Liz Wylie	- KIFCON, Kenya
Bernard Verdcourt	- Royal Botanic Gardens, UK
Kaj Vollesen	- Kew Gardens, UK

Other key Regional Forestry Officers and Regional Natural Resources Officers from Tanzania and Kenya will also be invited.

All invitees are welcome to suggest further people who they feel should attend the workshop. When suggesting additional people could the reasons for their inclusion be outlined, and an address, phone and fax number provided.

We expect that the final number of people attending this workshop will be around 30.

Society for Environmental Exploration
University of Dar es Salaam

COASTAL FORESTS OF EAST AFRICA

DATA SHEET

NOTE: Please read the accompanying guidelines for the completion of data-sheets before attempting to complete this form.

Please return completed data-sheets to:

N.D. Burgess,
RSPB - the BirdLife partner in the UK,
The Lodge,
Sandy,
Beds, SG19 2DL, UK

1. Country: **2. Region:** **3. District**

4. Names of site

5. Date of completion **6. Name and address of compiler**

List number of extra sheets added _____

7. General location of site

8. Geographical co-ordinates

9. Area (in hectares) **10. Altitude**

11. Topography, climate, hydrology, soils, geology

Supported by: BirdLife International

12. Biological importance: The following sub-sections are intended as guidelines only. However, it would be helpful if the compilers adopted this structure as closely as possible. Please add extra sheets as necessary. **(see Guidance Notes in order to fill in this section)**

1. Rarity

GROUP: .....

Species	IUCN class of rarity (E,V,L,R,U-K,Nt,C)	'Informal Rarity Scores" (1,2,3,4,5,6,7,8, other)	Population (Z,X,C,V,B)	Reliability Notes (*,**,***,numbers)

Please indicate study effort for each biological group separately if one overall figure (see below) does not represent study effort correctly:

---

2. Restricted/Threatened Habitats present:

---

3. Overall Study Effort

(please ring the category which most accurately describes study effort at the site)

1. Not visited	1
2. Visited once	2
3. Brief survey in one season	3
4. Brief survey in several seasons, or thorough survey in one season	4
5. Comprehensive surveys over many years	5

References, or names of workers with relevant data can be listed here or in section 20:

13. Habitats:

Please give % cover of each main habitat

evergreen forest	mangrove
semi-evergreen forest	swamp
deciduous forest	plantation
coastal thicket	agriculture/cultivation
savanna-woodland	artificial
grassland	
other (please specify)_____	

---

14. Damage/Threats:

Please give a summary of those actions which have, are, or might in the future significantly damage the site.

Classify impact of activities using increasing number of stars to indicate increasing significance:
*** - Critical significance ** - Major significance * - Minor significance

- Where an activity has had an effect on the forest, but is now discontinued, *bracket* its score, e.g. (**)
- Where an activity does not tale place, but there is a significant risk of it starting in the future, use *exclamation marks* in place of asterisks, e.g. !!
- Where it is not possible to decide the significance of an activity, but it is known to occur/have occurred/will occur, *ring* the appropriate box.

Clearance for agriculture	Charcoal production
Logging	Fuel-wood gathering
Pole cutting	Mining
Fire	Loss of traditional beliefs
Disease	Hunting for bush-meat
Re-afforestation	Built development
Grazing	Pitsawing
Other (specify) _____	

---

15. Land Ownership and Legal Status

a) Land ownership:

b) Legal status:

---

16. Current land-uses: economic, cultural and social uses of site

a) Current land-use(s) of the site. Please classify as: *** - Predominant, ** - Major, * - Minor

None
Logging (sustainable)
Wildlife conservation/research
Rangeland (livestock)
Hunting
Research
Religious or Historical
Other 'minor forest products'
Other (specify) _____

Pitsawing
Agriculture
Tourism
Water supply
Recreation
Conservation Education
Local Medicines

b) Current land use(s) of surrounding land (please specify)

---

17. Conservation Measures taken (protected areas/other measures)

---

18. Conservation measures proposed:

---

19. References; cite key references in full

---

20. Relevant maps available: list of maps covering site

THANK YOU VERY MUCH FOR YOUR HELP

Please return forms to Neil Burgess, Royal Society for the Protection of Birds, The Lodge, Sandy, Beds, SG19 2DL, UK. Tel. 0044 (0)767 680551 Fax. 0044 (0)767 692365

Coastal Forest workshop is sponsored by: NORAD, RSPB, UDSM & Society for Environmental Exploration

Guidelines for the completion of Data-sheets

How to fill in the data sheet

A data sheet should be completed for each individual forest. A completed example of the data sheet is enclosed, as well as several blank sheets for photocopying.

Only some of the participants have been asked to complete the full sheet. Others are requested to supply biological information relating to named sites to facilitate the compilation of biological data, without undue repetition in filling out the site data sections.

Those participants asked to complete full sheets are urged to fill out as many sections of the data-sheet as possible. In the case of a site which has been well documented, or which is the subject of a special field investigation, far more information may be available than can be accommodated on a data sheet. If this is so additional information can be provided as separate pages.

The following notes relate to the various sections on the data sheet:

1. Country:	The name of the country the site occurs in
2. Region	The name(s) of the administrative Region the site falls in
3. District:	The name(s) of the administrative District the site falls in
4. Name of site:	The name(s) widely used for the site. Place the name used by the local management authority first and underline it.
5. Date of completion:	The date on which the data-sheet was completed by the compiler
6. Name and address:	The full name and address of the person compiling the data-sheet, with any telephone, fax and telex numbers
7. General Location:	A very short description of the general location of the site within the country to enable readers to orientate themselves and picture the geographical location, e.g. the rough distance (in a straight line) and compass direction of the site from the nearest significant village or town.
8. Geographical co-ordinates:	The geographical co-ordinates (latitude and longitude, degrees and minutes. If the site is large, please also give the co-ordinates of the site's boundary (north-south and east-west spans).
9. Area:	The area of the site in hectares. It is important to specify which map or delineated site boundary this area refers to if more than one boundary configuration has been proposed or has existed for the site in the past.
10. Altitude:	The highest and lowest points of the forest in meters above mean sea level, or average altitude if the terrain is level.
11. Topography, climate hydrology, soils, geology	Give a brief description of the principal physical features of the site.

12. Biological Importance: This section is to list all significant species or habitats at the site and to note the reason for their significance (i.e. known or suspected to be threatened, of restricted distribution, or comprising unusual distributional or ecological records. Please do not assume knowledge of a forest - even if a published description of a forest exists it will probably be based on incomplete information and may contain inaccuracies - your information will be valuable for corroborative purposes.

1. Rarity values: We wish to collect data on the rare and threatened species in these forests as a measure of their biodiversity significance. Because we realise that some of the established criteria are inadequate for species in the coastal forests we are keen to collect data both in terms of the standard (IUCN) criteria of rarity, and to also use an informal method for determining the rarity of species. These 'informal rarity scores' will enable us to refine the 'rarity' of those species with existing IUCN assignations, and will also enable us to determine which other species are genuinely 'rare' in the coastal forests, or globally.

Please list species under headings for broad groups: vascular plants, lower plants, birds, bats, other mammals, reptiles, amphibians or invertebrate Class and Order. Where species remain undescribed, please indicate how many new species and to which families they belong, and if possible note if they represent a new genus, a significant distributional record etc. Please indicate by *placing the species name in brackets* if the species determination is not totally reliable (poor sighting, unqualified personnel, preliminary identifications).

i) IUCN classification: All species which are regarded as 'threatened','near-threatened' or 'candidate' by their inclusion in a Red Data Book should be recorded. Where possible the category of threat should also be given under the columns provided. In order, these threats are Endangered (E), Vulnerable (V), Indeterminate (I), Rare (R), Insufficiently known (U-K), Near-threatened (N-t) and Candidate (C).

ii) 'Informal Rarity Scores'. Species believed to be rare by the compiler of the sheet, but for which there are no published criteria for status, should be recorded in the relevant column on the data-sheet. **It is important that these informal criteria are also completed for species which have IUCN rankings as we may be able to refine the IUCN assessment of threatenedness for coastal forest species.**

The 'Informal rarity scores' are set out below, of these 1-5 are the most significant:

1. - to date known from only this site in the world
2. - known from 2-5 sites
   - 2a - these are all coastal forests
   - 2b - these are not all coastal forests
3. - known from 6-15 sites
   - 3a - these are all coastal forests
   - 3b - these are not all coastal forests
4. - known from >15 sites but restricted to coastal forests
5. - restricted to coastal East Africa, rare, and coastal forests are crucial to the species at some stage during its life cycle
6. - found further afield, rare, coastal forests are crucial to the species at some stage in its life cycle
7. - common elsewhere, but coastal forest population represents a significant ecological or distributional record for this species
8. - other (please state)

2. Population status:

a) viability

Please consider whether the forest is sufficiently large to support a long-term reproductively viable population of the species and mark this in the appropriate column on the data-sheet.

Classes to choose from are:

Z - population represents 'living dead': not a viable population
X - population of concern: species restricted to very limited habitat within the forest, e.g. a river bank
C - Population of concern: species spread at low population through the forest
V - Population of concern: species may not be able to recover from ecological 'shocks', such as disease or environmental change
B - Population needs assessing and may be of concern

b) population reliability

If possible estimates of population status for the most important species should also be given.

It is useful to indicate the reliability of these counts using the following codes:

* = rough estimate/no quantitative data available
** = reasonable estimate/based on incomplete or poor quantitative data
*** = accurate count or estimate/based on reliable quantitative data

3. Restricted or threatened habitats:

Any habitats or communities you know or suspect to be endangered/rare, *or crucial to the ecology of a particular forest (e.g. a wetland in the centre of an otherwise dry forest)*

4. Study Effort:

Please ring the score which best describes the study effort in the forest. Please indicate study effort for each group separately if one overall figure for the forest would not be accurate.

13. Habitats

Give a brief description of the main habitats present, including any dominant forest plant species.

In the boxes give the approximate % cover of the major habitats at the site, using the following classification

Evergreen forest: where the canopy trees remain evergreen all year
Semi-evergreen forest: where some of the canopy trees loose their leaves in the dry season
Mostly-deciduous forest: where the majority of the canopy trees all loose their leaves during the dry season, but there is a largely evergreen shrub layer and the canopy is closed.
Coastal thicket: evergreen or semi-evergreen woody vegetation where the canopy height is less than 8m.
Savanna-woodland: grass-dominated vegetation with a scattering of normally deciduous trees and some palms, canopy not closed.
Grassland: grass dominated vegetation.
Mangrove: Mangrove tree dominated vegetation.
Swamp: wetland vegetation.
Plantation: Plantations of native or exotic tree species.

14. Damage/Threats

Briefly summarise any human activities at the site which have had, are having, or might in the future have an harmful effect on the natural ecological character of the site.

In the boxes rank the levels of damage/threat where applicable with:

*** (Critical damage), ** (Major damage) or * (Minor damage), according to the percentage of the resource which has been affected:

*** = more than 50% of resource affected
** = 10-50% of resource affected
* = less than 10% of resource affected

- Where an activity has had an effect on the forest, but is now discontinued, *bracket* its score, e.g. (**)
- Where an activity does not tale place, but there is a significant risk of it starting in the future, use *exclamation marks* in place of asterisks, e.g. !!
- Where it is not possible to decide the significance of an activity, but it is known to occur/have occurred/will occur, *ring* the appropriate box.

15. Land ownership and Legal Status:

a) Land ownership:

Give details of ownership of the site and the surrounding area if relevant, e.g. government, private, commercial, religious, communal, none. Note any proposed future changes. Also describe traditional rights over the site wherever possible.

b) Legal status:

Describe the legal status of the site, e.g. Forest Reserve, National Park, Game Reserve. Also provide details of the intended use of the site, e.g. Productive Forest Reserve for sustained production of timber, or - Protected Forest Reserve for Water Catchment Protection.

16. Current land-uses: economic, cultural and social values

a) current land use of site:

Specify the principal human activities and the main forms of land use at the site using the ranked boxes:

*** (Principal land-use),
** (Major land-use),
* (Minor land-use), according to their economic, cultural and social importance at the present time.

b) current use of surrounding land:

Please specify the main uses of the surrounding land, e.g. shifting agriculture, no use, commercial plantation

17. Conservation measures taken:

Give details of any areas protected as Forest Reserves, National Parks, Game Reserves or through some other statutory means, and note effectiveness of these measures where information are readily available. Also note any non-governmental protection, e.g. private estate, community forest etc.

18.Conservation measures proposed:

Give details of any conservation measures which have been proposed for the site, including proposals for legislation, protection or management. Make clear distinction between:
a) Existing proposals, officially submitted by the appropriate government body.
b) New proposals, not yet endorsed officially, e.g. report recommendations, resolutions from specialist meetings etc.

19. References:

Cite key references relevant to the site.

20. Relevant maps available:

Important: please attach copies of published maps available (preferably of scale 1:50,000 or more detailed), with site boundary clearly delineated, as well as protected area boundaries where these differ. If there are no published maps, please attach a sketch map including where possible: site boundaries, distribution of main habitat types, scale, compass North, latitude-longitude, access points.

THANK YOU VERY MUCH FOR YOUR HELP

GUIDELINES FOR THE COMPLETION OF COASTAL FOREST MAP

- We enclose a map of East Africa upon which we hope it will be possible to mark all coastal forests. Please could you mark the positions and extent of all forests you know (or suspect) to exist. Unless a site is of particular biological or other significance, please exclude sites of less than 0.5km^2 total area in case they confuse the overall map.

- The map is at 1:5,000,000 scale, i.e. 1cm = 50km
  The grid is marked in Quarter Degree Squares.

- Using latitude and longitude, please position forests on the map as accurately as possible. Please attempt to indicate size and shape of the forest on the map, if the forest is sufficiently large.

- If you have a large number of forests to include, number them and list the forests by number on the reverse of the same map. Please also note the latitude and longitude of each forest in the list - to provide a double-check against map errors.

- IMPORTANT: Please also mark on the back of each map:
  - Your name and address
  - The sources of information, if any, for the forests you have marked.

  NOTE: Including the sources of information will help resolve any differences of opinion (over such things as names, whether the forest is coastal forest or not, and whether the forest still exists) when we come to compile the completed map.

- Please also retain a copy of the completed map in case the original gets lost in the post.

- We enclose one completed map of the coastal forests in Tanzania as an example.

THANK YOU VERY MUCH FOR YOUR HELP

APPENDIX 4:
COASTAL FOREST SITE DATA

Alphabetical Index to Coastal Forest Reference Numbers

NAME		NO.
Achonyi - see: Chonyi/Achonyi		
Amatongas	MOZ	242
Amboni caves - see: Mkulumuzi Gorge ...		
Arabuko-Sokoke FR, NR & NP (incl: Nyari within ...)	KY	54
Ashuweni Village & Tombs (in: Kiunga ...)	KY	[24]
Bagala	TZ	137
Baikopinda	MOZ	222
Barako Madow	SOM	2
Bate K.	KY	48
Bazaruto	MOZ	214
Benguera Is. - see: Chinhongue forest ...		
Bikisaga - see: Mulungu Mawe & Bikisaga		
Bogowa K. NM	KY	136
Bombo K. NM	KY	101
Bomu K. (in: K. Rabai)	KY	[85]
Boni	SOM	3
Boni NR	KY	17
Boni prop FR	KY	19
Boni Forest Game Reserve - old name for Boni NR		
Bore K. (incl: Ulaya Nyari at Bore)	KY	41
Buda Mafisini FR	KY	122
Bura K.	KY	46
Bura gallery forests (Nanigi, Bura W., Chewele, others)	KY	7
Bura West - see: Bura gallery forests ...		
Bvumbwe N. & Bvumbwe S. (in: Lower Tana ...)		
Bwatabwata - see: Pindiro/Bwatabwata		
Cape Vidal	S. A.	255
Cha Simba Sacred Grove	KY	69
Chale K. / Chale Island SG NM	KY	123
Chewele - see: Bura gallery forests ...		
Chilangala	TZ	209
Chilulu K.	KY	236
Chinhongue forest, Benguera Is.	MOZ	227
Chitanze K. / Kitsantse forest	KY	99
Chitema River	ZIM	248
Chitoa	TZ	204
Chonyi/Achonyi K. FR (incl: Vuga, Koyeni) (Kilifi District)	KY	72
Chonyi (Jivani) K. (Kwale District)	KY	94
Chuna gallery forest	KY	130
Dagamura , Starehe & Kilulu K.	KY	45
Dakabuko Hill	KY	37
Dakawachu Hill	KY	36
Dendene - see: Kisiju/Dendene		
Devil's / Hell's Kitchen	KY	40
Diani / Jandini Forest	KY	116
Diani K. NM	KY	112
Digo K. - see: Kwale/Digo ...		
Dindili	TZ	177
Dodori NR	KY	21
Dombe	MOZ	216
Dondo	MOZ	215
Dugumura - see: Teleza/Dugumura		
Dukuduku	S. A.	256
Duruma K. - see: Gandini ...		
Dzitsoni Caves	KY	68
Dzombo K. NM (in: Jombo FR)	KY	[118]
Famau Ruins & Famau Hill (in: Ras Tenewi ...)	KY	[30]
Fimboni K. (in: K. Rabai)	KY	[84]
Fungo / Giriama K.	KY	71
Galu / Ganzoni K. NM	KY	8
Gandini / Takawa / Duruma K.	KY	92
Ganzoni - see: Galu/Ganzoni ...		
Gede Ruins	KY	52
Gendagenda (South and North)	TZ	164
Giriama K. - see: Fungo/Giriama K.		
Giritu woodland (in: Lower Tana ...)		
Gobwe - see: Mariakani west ...		
Gogoni FR - see: Gongoni FR (Kwale District)		
Gongolamboto	TZ	182
Gongoni FR (Kwale District)	KY	119
Gongoni FR (Lamu District) - now part of Witu FR		
Gonja FR (incl: Gonja/Mwalewa K. NM)	KY	129
Gonja / Mwalewa K. NM (in: Gonja FR)	KY	[131]
Handeni Hill	TZ	161
Haroni	ZIM	232
Hell's Kitchen - see: Devil's/Hell's Kitchen		
Hemani patch (in: Lower Tana ...)		
Hewani W.1,W.2,S.1,S.2,E.1,E.2,E.3 (= Mewani) (in: Lower Tana ...)		
Hinju - see: Mtuli / Hinju		
Horohoro	TZ	140
Inhaca Island Dune Forest	MOZ	244
Inhamitanga	MOZ	226
Jambangombe	TZ	158
Jaribuni - see: North of Jaribuni ...		
Jego K. NM	KY	134
Jibana K. FR	KY	77
Jilore - see: Nyari at Jilore		
Jivani - see: Chonyi/Jivani		
Jombo FR (incl: K. Dzombo NM)	KY	121
Jozani / Unguju	TZ	172
Jumba la Mtwana NM	KY	88
Kalwe (in: Nkhata Bay ...)	MAL	[245]
Kambai FR	TZ	150
Kambai Public Lands	TZ	148
Kambe / Mbwaka K. & FR (Kilifi District)	KY	79
Kambe Rocks Sacred Grove	KY	58
Kambe K. (Kwale District) - see: Muhaka/Kambe ...		
Kanwe Mayi	KY	31
Kauma K.	KY	90
KAYAS - SEE UNDER INDIVIDUAL NAMES		
Kazimzumbwe	TZ	186
Kibongo Hill	KY	51
Kichi Hills	TZ	138
Kidzini K.	KY	10
Kilandiw Hill	TZ	174
Kilibasi hill	KY	4
Kilindoni	TZ	190
Kilisa - see: Taru & Kilisa hills		
Kilulu Hill ("Moa")	TZ	141
Kilulu K. - see: Dagamura, Starehe & Kilulu		
Kimboza	TZ	184
Kinangoni K.	KY	237
Kinondo K. - see: Ngalaani/Kinondo ...		
Kiono / Zaraninge	TZ	170
Kiponozi Ruins NM & Wells (in: Ras Tenewi ...)	KY	[29]
Kirima Cha Mpepe Sacred Grove	KY	241
Kirimani K.	KY	44
Kisiju / Dendene	TZ	187
Kiteje K. NM	KY	102
Kitovu	KY	13
Kitsantse - see: Chitanze/Kitsantse		
Kitulang'alo	TZ	178
Kiunga Marine NR (incl: Mvudeni, Ashuweni)	KY	6
Kivara K.	KY	67
Kiwengoma ("Matumbi")	TZ	191
Kojani Island	TZ	155

Legend: K. = Kaya; S.A. = South Africa; TZ = Tanzania; KY = Kenya; ZIM = Zimbabwe; MOZ = Mozambique; MAL = Malawi.

NAME		NO.
Nyangamara	TZ	208
Nyari at Jilore	KY	49
Nyari at Mjibu	KY	62
Nyari S.W. of Arabuko-Sokoke	KY	57
Nyari within Arabuko-Sokoke (in: Arabuko-Sokoke)	KY	[55]
Ochre Hills	S. A.	253
Pagale Hill	TZ	171
Palm woodland, Ramisi (3 patches)	KY	5
Pande	TZ	179
Pangani Falls	TZ	159
Pangani Rocks Sacred Grove	KY	80
Pangayambo Caves Sacred Grove	KY	53
Pindiro / Bwatabwata	TZ	195
Pugu	TZ	181
Pungu / Mvuakani K.	KY	263
Rabai K. (incl: Bomu, Fimboni, Mudzimuvia, Mwidzimwiru, 5 others)	KY	240
Rain Tree forest (in: Tana Delta ...)	KY	[32]
Ramisi - see: Palm woodland, Ramisi		
Rare River Gorge	KY	56
Ras Kiuyu	TZ	142
Ras Ngomen dune forest & woodland	KY	39
Ras Tenewi prop. Coastal Zone NR (incl: Kiponozi, Famau, Shaka, Wanawali, others)	KY	14
Ras ya Wanawali Sabaa and the Tombs of the Seven Virgins NM (in: Ras Tenewi ...)	KY	[35]
Ribe K. (incl. Ribe K. FR)	KY	82
Rondo (incl: Rondo extension)	TZ	206
Rondo extension (included with Rondo FR)	TZ	[139]
Ruawa	TZ	202
Rumbise Hill	ZIM	249
Rungo	TZ	200
Ruo Gorge (in: Southern Mulanje ...)	MAL	[247]
Rure K. - possibly = Mwamungu K.		
Rusitu	ZIM	233
Ruvu	TZ	180
Ruvu North	TZ	176
Ruvu South	TZ	183
Sailoni W. 1 & Sailoni W. 2 (in: lower Tana ...)		
Sega K. NM	KY	128
Segoma	TZ	149
Serra Mocuta (Mavita)	MOZ	243

NAME		NO.
Shaka Ruins NM (in: Ras Tenewi ...)	KY	[34]
Shimba Hills NR (incl: Kwale, Mkongani N., Mkongani W.)	KY	108
Shimoni forest	KY	133
Shimoni Cave Sacred Grove NM	KY	135
Shonda K.	KY	98
Shoonto	SOM	1
Similani Caves Sacred Grove	KY	104
Simkumbe forest patch	KY	109
Singwaya K.	KY	43
Sodwana Bay	S. A.	252
Southern Mulanje forests (incl: Ruo Gorge)	MAL	229
Starehe K. (S. of Sabaki R.)	KY	64
Starehe K. (N. of Sabaki R.) - see: Dagamura, Starehe & Kilulu		
Takawa K. - see: Gandini ...		
Tana Delta prop. Nat. Wetlands Res. (incl: Rain Tree forest)	KY	33
Tana River Primate NR	KY	20
Taru & Kilisa hills	KY	70
Teleza K. / Dugumura Hill SG	KY	103
Tiwi K. NM	KY	110
Tongwe	TZ	156
Ton'gombe	TZ	193
Tsolokero K.	KY	78
Ukunda K. NM	KY	114
Ulaya Nyari at Bore (in: K. Bore)	KY	[42]
Unguju - see: Jozani/Unguju		
Utwani - old name for Witu FR		
Vikindu	TZ	185
Vipingo Caves Sacred Grove	KY	75
Vuga K. (in: Chonyi/Achonyi)	KY	[74]
Vyambani cliffs	KY	66
Waa K. NM	KY	107
Wanawali Sabaa - see: Ras ya Wanawali Sabaa ...		
Wayu I, Wayu II, Wayu III & Kokani forests	KY	16
Wema W. 1, W. 2, W. 3, E. 1, E. 2 & E. 4 (= Mwima) (in: Lower Tana ...)		
Werune Cliffs	KY	38
Witu FR (incl: Witu FR extension)	KY	27
Witu FR extension (included with Witu FR)	KY	[28]
Yambe Island	TZ	154
Zaraninge - see: Kiono/Zaraninge		
Ziwani	TZ	207

East African Coastal Forests

SITES: KENYA

No.	Name	Province	District	Co-ords.	Altitude (m)	Quoted Area (km2)	Min. Forest Area (km2)	Size Class	Status	Land Ownership	Conservation Proposals / measures taken	Forest cover (Kenya only)
4	Kilibasi hill	Coast	Kwale, Teita Taveta	0357S 3857E	400 - 900	4	4	2	prop. FR & NR	? Trust Land	proposed for protection	**, *
5	Palm woodland, Ramisi (3 patches)	Coast	Kwale	0433S 3918E	15	10	10	3		Trust Land	proposed FR	**, *, o
6	Kiunga Marine NR (incl. 23, 24)	Coast	Lamu	0230S 4045E	< 100	c. 300	?	1	Marine NR	?		?
7	Bura gallery forests (incl. Nanigi & Chewele)	Coast	Tana River	0105S 3955E	60	1	1	2		Trust Land	proposed FR	**, *
8	Kaya Galu/Ganzoni NM	Coast	Kwale	0423S 3950E	5	0.1	0.1	1	NM	private		**
9	North Kilifi Brachystegia woodlands (4 sites)	Coast	Kilifi	0250S 3950E	50 - 100	500	500	5		Trust Land	proposed FR	**, *, o
10	Kaya Kidzini	Coast	Kilifi	?	?	?	?	?	existence not confirmed	Kaya : Trust		?
11	Malindi Point Sacred Grove	Coast	Kilifi	0317S 4007E	10	0.2	0.2	1		private	proposed NM	**
12	Mwache FR	Coast	Kwale	0400S 3932E	20 - 120	4.17	2.85	2	FR	Govt.		***, **, *, o
13	Kitovu	Coast	Taita Teveta	0326S 3736E	700	< 1	0.5	1		Trust Land		***
14	Ras Tenewi prop. CZNR (incl. 29,30,34,35, others)	Coast	Lamu, Tana River	0229S 4040E	0 - 60	105	105	5		Trust Land	proposed as Nat. Coastal Zone Reserve	**, *, o
[15]	Kaya Mudzimuvia (in 240)	Coast	Kilifi	0357S 393?E	?	[0.1]	[0.1]	[1]		Kaya : CC	proposed NM or FR	?
16	Wayu I, Wayu II, Wayu III & Kokani forests	Coast	Tana River	?	?	1120 ?	112	5		Trust Land	planned gazettement (Coast ASAL proj.)	?
17	Boni NR	North-Eastern	Garissa	0120S 4120E	50	1,358 / 870	870	5	NR	Govt.		**, *, o
18	Mbia	Coast	Tana River	0137S 4006E	45	1	1	2		Trust Land	proposed FR	***
19	Boni prop FR	Coast	Lamu	0140S 4051E	0 - 100	184.66	184	5	proposed FR	Trust land	proposed FR in 1950	***, **, *, o
20	Tana River Primate NR	Coast	Tana River	0143S 4003E	30 - 50	171	11	3	NR	Govt.		***, **, *, o
21	Dodori NR	Coast	Lamu	0143S 4056E	0 - 20	877 / 415	415	5	NR	Govt.		**, *, o
22	Lunghi prop FR	Coast	Lamu	0144S 4045E	0 - 20	95.17	96	5	proposed FR	Trust land	proposed FR in 1950	***, **, *, o
[23]	Mvundeni Village (in 6)	Coast	Lamu	0150S 4120E	5	[0.1]	[0.1]	[1]	in Marine NR	Trust land	proposed NM	*
[24]	Ashuweni Village & Tombs (in 6)	Coast	Lamu	0151S 4120E	15	[0.1]	[0.1]	[1]	NM in Marine NR	Trust land		*
25	Lower Tana gallery forests (30+ patches, incl. 26)	Coast	Tana River	0210S 4010E	10 - 30	?	10	3		Trust land	some areas proposed for gazettement	***, **, *
[26]	Mlango ya Simba Bridge (in 25)	Coast	Tana River	0215S 4021E	11	[0.1]	[0.1]	[1]		Trust land	proposed FR	**, *
27	Witu FR (incl. 28)	Coast	Lamu	0222S 4030E	10 - 20	39.37 / 14.20	14	3	FR	Govt.	G.A.S.P. agroforestry project	***, **, *, o
[28]	Witu FR extension (adj. 27)	Coast	Lamu	0223S 4031E	20	[c. 1]	[0.9]	[1]		Trust land	proposed for inclusion in FR	***, **, *
[29]	Kiponozi Ruins NM & Wells (in 14)	Coast	Lamu	0224S 4045E	5	[0.1]	[0.1]	[1]	NM	Trust land		*
[30]	Famau Ruins & Famau Hill (in 14)	Coast	Lamu	0226S 4043E	57	[0.1]	[0.1]	[1]	NM	Trust land	in proposed Ras Tenewi NCZR	**, *, o
31	Kanwe Mayi forest fragments (5 - 7 patches)	Coast	Tana River	0227S 4028E	10	1	1	2	set aside in settlement sch	Trust land	proposed FR	**, *, o
[32]	Rain Tree forest (in 33)	Coast	Tana River	0230S 4020E	5	[1]	[1]	[2]		Trust land	prop. FR; in prop. RTCZNR (no. 14)	***, **
33	Tana Delta (incl. 32)	Coast	Tana River	0230S 4020E	?	3400	20	4		Trust land	prop. Nat. Wetlands Res.	**, *, o
[34]	Shaka Ruins NM (in 14)	Coast	Tana River	0232S 4034E	5	[0.1]	[0.1]	[1]	NM	Trust land	in proposed Ras Tenewi NCZR	*
[35]	Ras ya Wanawali Sabaa Tombs NM (in 14)	Coast	Tana River	0233S 4037E	15	[0.1]	[0.1]	[1]	NM	Trust land	in proposed Ras Tenewi NCZR	*
36	Dakawachu Hill	Coast	Kilifi	0241S 3937E	227	0.1	0.1	1		Trust land	proposed FR	**, *, o
37	Dakabuko Hill	Coast	Kilifi	0253S 3938E	356	5	5	3		Trust land	proposed FR	**, *, o
38	Werune Cliffs	Coast	Kilifi	0256S 3952E	80 - 100	1	?	?	poss. in 9	Trust land	investigate; proposed for protection	**, *, o
39	Ras Ngomeni dune forest & woodland	Coast	Kilifi	0258S 4008E	50	1	1	2		Trust land	proposed for protection	**, *, o
40	Devil's / Hell's Kitchen	Coast	Kilifi	0301S 3957E	45 - 80	1	1	2		Trust land	proposed for protection	*
41	Kaya Bore (incl. / adj. 42)	Coast	Kilifi	0303S 3953E	115	c. 0.5	0.4	1		Kaya : Trust	proposed NM	**
[42]	Ulaya Nyari at Bore (in / adj. 41)	Coast	Kilifi	0303S 3953E	45 - 100	[?]	[?]	[?]		Kaya : Trust	proposed for protection	**
43	Kaya Singwaya	Coast	Kilifi	0306E 3951E	60	0.1	0.1	1		Kaya : Trust	proposed NM	?
44	Kaya Kirimani	Coast	Kilifi	0307S 3951E	50	< 1	0.25	1		Kaya : Trust	proposed NM	?
45	Kayas Dagamura, Starehe & Kilulu	Coast	Kilifi	0307S 3955E	45	1	1	2		Kaya : Trust	proposed NM or FR	**
46	Kaya Bura	Coast	Kilifi	0308S 3956E	45	1	0.5	1		Kaya : Trust	proposed NM	**
47	Lower Sabaki Wetlands (various sites)	Coast	Kilifi	0311S 3953E	30	0.1	0.1	1		Trust / private	prop. (private) wildlife sanctuary at one site	**
48	Kaya Bate	Coast	Kilifi	0311S 3955E	30	0.25	0.25	1		Kaya : Trust	proposed NM	**
49	Nyari at Jilore	Coast	Kilifi	0311S 3956E	30 - 105	1	1	2		Trust land	proposed addition to Arabuko FR	**
50	Mangea Hill	Coast	Kilifi	0315S 3943E	10 - 520	35	35	4	prop. FR & NR	Trust land	proposed FR in 1987	***, **, *, o
51	Kibongo Hill	Coast	Kilifi	0315S 4006E	20	0.1	0.1	1		private	proposed for protection	**
52	Gede Ruins	Coast	Kilifi	0318S 4000E	15	0.35	0.35	1	NM	Govt.	proposed NP	**
53	Pangayambo Caves Sacred Grove	Coast	Kilifi	0319S 4002E	15	< 0.1	0.05	1		private	proposed NM	**
54	Arabuko-Sokoke FR, NR & NP (incl. 55)	Coast	Kilifi	0320S 3955E	0 - 210	417.64	370	5	FR	Govt.	new management plan	***, **, *, o
[55]	Nyari within Arabuko-Sokoke (in 54)	Coast	Kilifi	0320S 3951E	90 - 140	[?]	[?]	[?]	FR	Govt.	new management plan	see 52
56	Rare River Gorge	Coast	Kilifi	0327S 3945E	120	0.1	0.1	1		Trust land	proposed for protection	**
57	Nyari S.W. of Arabuko-Sokoke	Coast	Kilifi	0330S 3948E	100 - 170	0.1	0.1	1		Trust land	prop. addition to Arabuko-Sokoke FR	**, o

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58	Kambe Rocks Sacred Grove	Coast	Kilifi	0332S 3939E	90	0.25	0.25	1		Kaya : Trust	proposed NM	**
59	Mulungu Mawe & Bikisaga SG	Coast	Kilifi	0333S 3937E	165	< 0.1	0.05	1		Trust land	proposed NM	**
60	Njora River Gorge	Coast	Kilifi	0334S 3943E	75	0.1	0.1	1		Trust land	proposed for protection	**
61	North of Jaribuni forest patch	Coast	Kilifi	0335S 3944E	120	0.1	0.1	1		? private	proposed for protection	**
62	Nyari at Mjibu	Coast	Kilifi	0335S 3948E	120	0.01	0.01	1		? private	proposed for protection	**
63	Mnarani	Coast	Kilifi	0338S 3950E	20	0.01	0.01	1	NM	Govt.		**
64	Kaya Starehe	Coast	Kilifi	0339S 3941E	210	0.01	0.01	1		Kaya : Trust	proposed NM	**
65	Ndzovuni River Gorge	Coast	Kilifi	0339S 3943E	100	0.01	0.01	1		Trust land	proposed for protection	**
66	Vyambani cliffs	Coast	Kilifi	0339S 3944E	100 - 170	0.01	0.01	1		? private	proposed NM	**
67	Kaya Kivara	Coast	Kilifi	0341S 3941E	324	1.5	1.5	2		Kaya : Trust	proposed NM or FR	**
68	Dzitsoni Caves	Coast	Kilifi	0342S 3944E	120	0.1	0.1	1		? private	investigate; proposed NM	**
69	Cha Simba Sacred Grove	Coast	Kilifi	0344S 3941E	200	0.2	0.2	1		Kaya : private	proposed NM	**
70	Taru & Kilisa Hills	Coast	Kwale	0345S 3906E	500	c. 17	16	4		Trust land	proposed FR	**
71	Kaya Fungo / Giriama	Coast	Kilifi	0347S 3930E	180	c. 1	0.9	1		Kaya : Trust	proposed NM or FR	**, o
72	Kaya Chonyi/Achonyi FR (incl. 74, 76)	Coast	Kilifi	0347S 3940E	210	2	2	2	FR	Kaya : Govt.	proposed NM	**, o
73	Mwarakaya Sacred Grove	Coast	Kilifi	0347S 3941E	120	0.25	0.25	1		Kaya : private	proposed NM	**
[74]	Kaya Vuga (in 72)	Coast	Kilifi	0348S 3940E	210	[?]	[?]	[?]	in FR	Kaya : Govt.		**, o
75	Vipingo Caves Sacred Grove	Coast	Kilifi	0348S 3949E	15	0.1	0.1	1		Kaya : private	proposed NM	**
[76]	Kaya Koyeni (in 72)	Coast	Kilifi	0349S 3940E	210	[0.5]	[0.5]	[1]		Kaya : Trust	proposed NM	**
77	Kaya Jibana FR	Coast	Kilifi	0350S 3940E	308	1.5	1.5	2	FR	Kaya : Govt.	proposed NM	***, **, o
78	Kaya Tsolokero	Coast	Kilifi	0350S 3944E	135	0.25	0.25	1		Kaya : ? private	proposed NM	**, o
79	Kaya Kambe / Mbwaka Kaya & FR	Coast	Kilifi	0351S 3938E	180	0.75	0.6	1	57ha (75%) is FR	Kaya : Govt.	proposed NM	***, **, o
80	Pangani Rocks Sacred Grove	Coast	Kilifi	0351S 3940E	75	0.5	0.5	1		Kaya : private	proposed NM	**
81	Mariakani west forests (Kumbulu & Gobwe)	Coast	Kwale	0352S 3921E	320	1	?	?	existence not confirmed	Trust land	proposed for protection if exists	**
82	Kaya Ribe (incl. K. Ribe FR)	Coast	Kilifi	0353S 3937E	105	1	1	2	36ha (33%) is FR	Kaya : Govt.	proposed NM	***
83	Kombeni River Gorge	Coast	Kilifi	0354S 3935E	150	0.1	0.1	1		Trust/CC/private	prop. for inclusion in FR or NM	**
[84]	Kaya Fimboni (in 240)	Coast	Kilifi	0355S 3935E	150	[1.5]	[1.5]	[2]		Kaya:Trust/CC/priva	proposed NM or FR	***, **, o
[85]	Kaya Bomu (in 240)	Coast	Kilifi	0356S 3935E	210	[3]	[3]	[2]		Kaya:Trust/CC/priva	proposed NM or FR	***, **, o
86	Mtwapa Creek north bank	Coast	Kilifi	0356S 3942E	30	1	?	?	existence not confirmed	? private	proposed for protection if exists	**
87	Mtwapa NM	Coast	Kilifi	0356S 3945E	10	0.05 ?	0.05	1	NM	Govt.		**
88	Jumba la Mtwana NM	Coast	Kilifi	0356S 3946E	0 - 10	0.1 ?	0.1	1	NM	Govt.		*
[89]	Kaya Mwidzimwiru (in 240)	Coast	Kilifi	0357S 3934E	255	[1]	[1]	[1]		Kaya:Trust/CC/priva	proposed NM or FR	**, o
90	Kaya Kauma	Coast	Kilifi	0357S 3944E	120	1	1	2		Kaya : Trust	proposed NM or FR	***, **, o
91	Nguu Tatu hill	Coast	Mombasa	0358S 3940E	15 - 75	0.01	0.01	1		private	proposed for protection	**
92	Kaya Gandini / Takawa / Duruma	Coast	Kwale	0401S 3930E	140 - 200	1.5	1.5	2	NM	Kaya : CC		***, **
93	Kaya Mtswakara	Coast	Kwale	0401S 3931E	20 - 140	1.2	1.2	2		Kaya : Trust	proposed NM	***, **
94	Kaya Chonyi (Jivani)	Coast	Kwale	0403S 3931E	50	1.5	1.5	2		Kaya : Trust	proposed NM	**
95	Maluganji FR (incl. 96)	Coast	Kwale	0404S 3926E	30 - 300	17.15	14	3	FR	Govt.		***, **, o
[96]	Kaya Mtai / Mtae NM (in 95)	Coast	Kwale	0406S 3927E	300	[?]	[?]	[?]	NM in FR	Kaya : Govt.		see 95
97	Kaya Ngyorani	Coast	Kwale	0406S 3930E	?	0	0	1		Kaya : Trust		o ? (probably no forest present)
98	Kaya Shonda	Coast	Mombasa	0406S 3938E	30	0.1	0.1	1	NM	Kaya : CC		**
99	Kaya Chitanze / Kitsantse forest	Coast	Kwale	0407S 3928E	280	c. 0.3	0.25	1		Kaya:Trust/private	proposed NM	**
100	Kaya Lunguma	Coast	Kwale	0407S 3931E	100	1.5	1.5	2		Kaya:Trust/Govt.	proposed NM	***, **
101	Kaya Bombo NM	Coast	Kwale	0407S 3934E	90	< 0.1	0.05	1	NM	Kaya : CC		**
102	Kaya Kiteje NM	Coast	Kwale	0407S 3934E	20	c. 0.2	0.15	1	NM	Kaya : CC		* ? (wooded grassland ?)
103	Kaya Teleza / Dugumura Hill SG	Coast	Kwale	0408S 3930E	255	1	1	2	(note: gazetted as "Dungu	Kaya : CC	proposed NM	**
104	Similani Caves Sacred Grove	Coast	Mombasa	0408S 3938E	5	0.1	0.1	1	NM	Kaya : CC		**
105	Kaya Miyani	Coast	Kwale	0409S 3926E	400	c. 0.25	0.2	1		Kaya	proposed NM	**
[106]	Kaya Kwale / Digo NM (in 108)	Coast	Kwale	0410S 3926E	390	[?]	[?]	[?]	NM in NR	Kaya : Govt.		see 108
107	Kaya Waa NM	Coast	Kwale	0411S 3936E	15	c. 0.2	0.15	1	NM	Kaya : CC		**
108	Shimba Hills NR (incl. 106, 111, 113)	Coast	Kwale	0415S 3920E	100 - 448	192.6	63	5	NR	Govt.		***, **, *, o
109	Simkumbe forest patch	Coast	Kwale	0415S 3930E	?	?	?	1	?	? Kaya		?
110	Kaya Tiwi NM	Coast	Kwale	0415S 3935E	5	< 0.1	0.05	1	NM	Kaya : CC		**
[111]	Mkongani North FR (adj. 108)	Coast	Kwale	0416S 3918E	100 - 200	11.13	[11]	[3]	FR in NR	Govt.		***, **
112	Kaya Diani NM	Coast	Kwale	0416S 3935E	15	0.2	0.2	1	NM	Kaya : CC		**
[113]	Mkongani West FR (adj. 108)	Coast	Kwale	0417S 3916E	100 - 200	13.66	[13]	[3]	FR in NR	Govt.	(note: Fire stopped 1990)	***, **
114	Kaya Ukunda NM	Coast	Kwale	0418S 3933E	20	0.2	0.2	1	NM	Kaya : CC		**
115	Kaya Muhaka / Kambe / Mwadabara NM	Coast	Kwale	0419S 3931E	45	1.5	1.5	2	NM	Kaya : CC		***
116	Diani / Jadini Forest	Coast	Kwale	0419S 3933E	10	c. 0.85	0.8	1	(F.Z.S. Project)	private	prop. joint conservation area	**
117	Mwereni Brachystegia woodland	Coast	Kwale	0420S 3911E	150	c. 1.5	1.4	2		Trust land	proposed FR	**
[118]	Kaya Dzombo NM (in 121)	Coast	Kwale	0423S 3912E	462	[?]	[?]	[?]	NM in FR	Kaya : Govt.		see 121
119	Gongoni FR	Coast	Kwale	0424S 3928E	10 - 70	8.24	6.35	3	FR	Govt.		***, **

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120	Kaya Ngalaani/Kinondo NM	Coast	Kwale	0423S 3932E	5	0.3	0.3	1	NM	Kaya : CC		**
121	Jombo FR (incl. 118)	Coast	Kwale	0426S 3912E	100 - 520	9.07	2.92	2	FR	Govt.		***, **, o
122	Buda Mafisini FR	Coast	Kwale	0426S 3923E	70 - 80	6.68	6	3	FR	Govt.		***
123	Kaya Chale / Chale Island SG NM	Coast	Kwale	0426S 3931E	6	0.5	0.5	1	NM	Kaya : private	in area of a prop. Marine NR	**
[124]	Kaya Mrima / Mrima Hill SG NM (in 125)	Coast	Kwale	0427S 3915E	285	[?]	[?]	[?]	in FR	Kaya : Govt.		see 125
125	Mrima FR (incl. 124)	Coast	Kwale	0428S 3915E	80 - 300	3.77	2.9	2	FR & NR	Govt		***, **, o
126	Kaya Msambweni	Coast	Kwale	0428S 3929E	?	?	?	?	existence not confirmed	?Kaya:?private	further investigation: protect if Kaya	?
127	Marenji FR	Coast	Kwale	0429S 3912E	30 - 160	15.29	15	4	FR	Govt.		***, **
128	Kaya Sega NM	Coast	Kwale	0433S 3906E	60	0.5	0.5	1	NM	Kaya : CC		**
129	Gonja FR (incl. 131)	Coast	Kwale	0434S 3907E	30 - 90	8.42	6	3	FR	Govt.		**
130	Chuna gallery forest	Coast	Kwale	0433S 3908E	40	1	1	2		? private / Trust	proposed FR	**
[131]	Kaya Gonja/Mwalewa NM (in 129)	Coast	Kwale	0434S 3907E	75	[?]	[?]	[?]	NM in FR	Kaya : Govt.		see 129
132	Miongoni gallery forest	Coast	Kwale	0436S 3901E	20	c. 0.8	0.7	1		private	proposed for protection	**
133	Shimoni forest	Coast	Kwale	0437S 3921E	20	c. 6	5	3		? Trust / private	proposed for protection	**
134	Kaya Jego NM	Coast	Kwale	0438S 3911E	10	> 0.1	0.11	1	NM	Kaya : CC		**
135	Shimoni Cave Sacred Grove NM	Coast	Kwale	0438S 3922E	5	< 0.1	0.05	1	NM	Kaya : CC		**
136	Kaya Bogowa NM	Coast	Kwale	0439S 3923E	5	< 0.1	0.05	1	NM	Kaya : CC		*
236	Kaya Chilulu	Coast	Kilifi	?	?	?	?	?	existence not confirmed	?		?
237	Kaya Kinangoni	Coast	Kilifi	?	?	?	?	?	existence not confirmed	?		?
238	Kaya Madunguni	Coast	Kilifi	poss. near 49	?	0.1	0.1	1	existence not confirmed	?	proposed NM	?
239	Kaya Maiowe	Coast	Kilifi	?	?	0.1	0.1	1	existence not confirmed	?	proposed NM	?
240	Kaya Rabai (incl. 15, 84, 85, 89, 5 others)	Coast	Kilifi	035?S 393?E	?	> 5.6	5.6	3		?	(see 15, 84, 85, 89)	see: 15, 84, 85, 89
241	Kirima Cha Mpepe Sacred Grove	Coast	Kilifi	?	?	0.1	0.1	1	existence not confirmed	?	proposed NM	?
261	Kaya Mvumoni	Coast	Kwale	042?S 39??E	6	0.108	0.108	1		?	land set aside temporarily	o ? (secondary thicket)
262	Mwamungu forest patch	Coast	Kwale	0416S 3932E	?	?	?	1		? Kaya		?
263	Kaya Pungu / Mvuakani	Coast	Mombasa	0407S 3938E	?	?	?	1		Kaya : ?		**
264	Kaya Mlele	Coast	Mombasa	040?S 393?E	?	?	?	1		Kaya : ?		?
265	Lunga Lunga gallery forest	Coast	Kwale	043?S 390?E	40	1	1	2	existence not confirmed	? private / Trust		* or **
						TOTAL:	2,944					

Min. Forest Area = minimum likely area of forest habitat remaining (as distinct from total gazetted area of Reserve/Park).

(blank) = nothing, or not relevant **? = no data available** c. = circa

IN where site within + considered part of other site indicated

INCL where contains sites indicated + can be considered as a whole

adj. = sites ADJOINING and comprise single ecological unit and should best be considered as a single site

SITES: TANZANIA

No.	Name	Region	District	Co-ords.	Altitude (m)	Quoted Area (km2)	Min. Forest Area (km2)	Size Class	Status	Land Ownership	Conservation Proposals	Conservation Measures Taken
137	Bagala	Coast	Kibaha	?	?	?	10	3	Proposed FR	Govt	GEF Project	
138	Kichi Hills	Coast	Rufiji	?	?	40	40	4	Proposed FR	Govt	GEF Project	
[139]	Rondo extension (adj. 206)	Lindi	Lindi	?	?	[?]	[7]	[3]	Proposed FR	Govt	proposed FR	
140	Horohoro	Tanga	Muheza	0437S 3905E	80	< 1	0.8	1		?		
141	Kilulu Hill ("Moa")	Tanga	Muheza	0446S 3907E	100 - 267	1.6	1.6	2	Proposed FR	Govt		
142	Ras Kiuyu	Pemba Is. N.	?	0452S 3950E	?	?	?	?		?		
143	Mafi Hill	Tanga	Korogwe	0453S 3810E	600 - 1480	45.08	45	4	FR - Catchment	Govt		
144	Mtapwa	Tanga	Muheza	0455S 3853E	140	4	4	2		?	proposed FR	
145	Msitu Mkuu	Pemba Is. N.	?	0455S 3940E	?	3 ?	2.5	2		?		
146	Ngezi	Pemba Is. N.	Micheweni	0455S 3942E	20	14.4	14.4	3	F R	Govt		
147	Kwamgumi	Tanga	Muheza	0457S 3842E	180 - 1000	10	10	3	FR - Prot.	Govt	Kambai Conservation Project	
148	Kambai Public Lands	Tanga	Muheza	0458S 3842E	160 - 200	11	11	3		?	proposed FR	
149	Segoma	Tanga	Muheza	0458S 3843E	180 - 1000	11	11	3	FR - Prot.	Govt	Kambai Conservation Project	IUCN Project
150	Kambai FR	Tanga	Muheza	0500S 3842E	180 - 800	8	8	3	F R	Govt	Kambai Conservation Project	IUCN Project
152	Marimba	Tanga	Muheza	0502S 3845E	180 - 300	5	5	3	F R	Govt	IUCN/Finnida	IUCN Project
153	Mkulumuzi Gorge and Amboni Caves	Tanga	Tanga Municipal	0505S 3902E	> 50	3.5	3.5	2		?		
154	Yambe Island	Tanga	Tanga Municipal	0506S 3910E	0 - 10	2	2	2		?		
155	Kojani Island	Pemba Is. N.	Wete	0509S 3952E	10 - 20	3 - 7	3	2		Local Villagers		protected by villagers
156	Tongwe	Tanga	Muheza	0518S 3844E	220 - 648	3	3	2	F R	Govt		
157	Mgelema	Pemba Is. S.	Mkoani	0519S 3942E	90	< 0.5	0.45	1		Local Villagers		
158	Jambangombe	Pemba Is. S.	Mkoani	0519S 3942E	90	< 0.5	0.45	1		Local Villagers		
159	Pangani Falls	Tanga	Muheza	0521S 3840E	20 - 180	1.5	1.5	2		Govt?		
160	Kwani	Tanga	Muheza	0521S 3841E	0 - 200	10	10	3	Degazetted F R	Govt	proposed re-gazettement	
161	Handeni Hill	Tanga	Handeni	0527S 3830E	790 - 1040	6.77	6.77	3	FR - Prot.	Govt		
162	Mgambo	Tanga	Handeni	0532S 3838E	300	20	20	4		?		
163	Msubugwe	Tanga	Pangani	0532S 3845E	120	44.08	44.08	4	FR	Govt		
164	Gendagenda (South and North)	Tanga	Handeni & Pangani	0533S 3838E	100 - 545	28	28	4	FR and public land	Govt	Catchment Forest Project	tree nursery; boundary cleared & planted
165	Mtunguru	Tanga	Handeni	0536S 3805E	580 - 760	29.32	29.32	4	FR	Govt	boundary planting	
166	Mbuzini	Tanga	Handeni	0538S 3800E	?	0.5	0.5	1		?		
167	Kwasumba	Tanga	Handeni	0539S 3803E	580 - 640	28	28	4	FR	Govt	Catchment Forestry Project	C. F. Proj. officer on site
168	Mkwaja	Tanga	Pangani	0552S 3847E	0 - 100	10	10	3	Private Ranch	private		no hunting allowed
169	Magotwe	Morogoro	Morogoro	0602S 3739E	400 - 700	7.09	7.09	3	Prop. FR - Catchment	Govt	propose gazettement	boundaries cleared
170	Kiono / Zaraninge	Coast	Bagamoyo	0608S 3838E	200 - 300	20	20	4	Proposed FR	Local Authority	Proposed FR	WWF project
171	Pagale Hill	Morogoro	Morogoro	0610S 3750E	300 - 500	32	32	4	FR - Catchment	Govt	replant boundary	
172	Jozani / Unguju	Zanzibar	?	0615S 3924E	< 20	3	3	2	FR	Govt	proposed National Park	
173	Muyuni	Zanzibar	?	0620S 3925E	?	280	10	3		?		
174	Kilandiw Hill	Morogoro	Morogoro	0622S 3744E	400 - 657	2	2	2	Ranch	Govt		
175	Msavula Hill	Morogoro	Morogoro	0627S 3745E	400 - 765	1.5	1.5	2	Ranch	Govt		
176	Ruvu North	Coast	Kibaha	0633S 3855E	40 - 140	0	2	2	FR	Govt		
177	Dindili	Morogoro	Morogoro	0639S 3757E	350 - 800	3 ?	3	2	FR	Govt	Catchment Forestry Project	boundaries resurveyed & demarcated
178	Kitulang'alo	Morogoro	Morogoro	0639S 3757E	350 - 774	26.38	26.38	4	FR - Catchment	Govt	Catchment Forestry Project	boundaries resurveyed & demarcated
179	Pande	Dar es Salaam	Kinondoni	0642S 3905E	100 - 200	11	11	3	Proposed GR	Govt		
180	Ruvu	Morogoro	Morogoro	0653S 3750E	200 - 480	30.93	30.93	4	FR - Catchemnt	Govt	regular boundary patrolling	boundaries resurveyed & demarcated
181	Pugu	Coast	Kisarawe	0654S 3905E	100 - 305	10	10	3	FR - Protective	Govt	GEF Project	WCST project
182	Gongolamboto	Dar es Salaam	Ukonga	0655S 3910E	100	0.01	0.01	1	graveyard	?		
183	Ruvu South	Coast	Kisarawe & Kibaha	0658S 3900E	120 - 260	980	98	5	FR - Protective	Govt		
184	Kimboza	Morogoro	Morogoro	0659S 3748E	300 - 400	5.05	5.05	3	FR - Catchment	Govt	Catch. For. Proj. - total protection	boundaries resurveyed & demarcated
185	Vikindu	Coast	Kisarawe	0659S 3917E	40 - 80	10	10	3	FR - Productive	Govt		WWF project
186	Kazimzumbwe	Coast	Kisarawe	0700S 3903E	120 - 280	23.5	23.5	4	FR - Protective	Govt	GEF Project	WCST project
187	Kisiju / Dendene	Coast	Kisarawe	0724S 3920E	0 - 5	2	2	2	Proposed FR	?	GEF Project	
188	Mchungu	Coast	Rufiji	0744S 3917E	0 - 15	2	2	2	FR - Protective	Govt		
189	Mrora	Coast	Mafia	0753S 3951E	< 20	38	3	2		?		included in proposed Marine Park
190	Kilindoni	Coast	Mafia	0755S 3940E	0 - 20	0.01	0.01	1		?		
191	Kiwengoma ("Matumbi")	Coast	Rufiji	0822S 3856E	300 - 750	22	22	4	Proposed FR - Protective	Govt	GEF Project	
192	Namakutwa-Nyamuete	Coast	Rufiji	0823S 3900E	150 - 380	12	12	3	FR	Govt		
193	Ton'gombe	Lindi	Kilwa	0825S 3901E	150 - 540	11	11	3	FR	Govt		
194	Nangoma	Lindi	Kilwa	0827S 3853E	500	0.01	0.01	1		?		protected by villagers

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195	Pindiro / Bwatabwata	Lindi	Kilwa	0830S 3917E	100 - 300	10	10	3	FR	Govt		
196	Mbinga	Lindi	Kilwa	0831S 3850E	1600 - 195	7	7	3	FR	Govt		
197	Mselezi	Morogoro	Ulanga	0846S 0852E	560 - 890	7.71	7.71	3	FR - Catchment	Govt	boundary clearing	
198	Mitundumbea	Lindi	Kilwa	0910S 3916E	500 - 650	3	3	2	FR	Govt		
199	Ngarama	Lindi	Kilwa	0917S 3915E	45 - 480	?	?	?	FR	Govt		
200	Rungo	Lindi	Kilwa	0922S 3852E	?	?	?	?	FR	Govt		
201	Ndimba	Lindi	Lindi	0937S 3939E	?	?	?	?	FR	Govt		
202	Ruawa	Lindi	Lindi	0940S 3935E	?	?	?	?	FR	Govt		
203	Matapwa	Lindi	Lindi	0957S 3930E	?	?	?	?	FR	Govt		
204	Chitoa	Lindi	Lindi	1002S 3920E		6	6	3	F R	Govt	Danish BirdLife Project	
205	Litipo	Lindi	Lindi	1002S 3929E	150 - 250	5	5	3	FR - Catchment	Govt		
206	Rondo (incl. 139)	Lindi	Lindi	1010S 3910E	465 - 885	18	25	4	FR	Govt	Danish BirdLife Project	
207	Ziwani	Mtwara	Mtwara rural	1021S 3915E	50	?	7.7	3	FR - Prot. & Catch.	Govt		
208	Nyangamara	Lindi	Lindi	1023S 3935E	?	6	6	3	Proposed FR	Local Authority		protected by villagers
209	Chilangala	Mtwara	Newala	1033S 3908E	?	?	?	?	Proposed FR	Govt		
210	Mtuli / Hinju	Mtwara	Mtwara rural	1033S 3947E	274	?	3	2	Proposed FR	Local Authority	proposed FR	
211	Mtiniko / Mnivata	Mtwara	Mtwara rural	1034S 3956E	182	?	17	4	Proposed FR	Local Authority	proposed FR	
212	Mahuta	Mtwara	Newala	1052S 3955E	?	?	?	?	Proposed FR	Govt		
213	Namikupula	Lindi	Lindi	1052S 3955E	?	?	?	?	? Proposed FR	Govt		
						TOTAL:	799					

SITES: SOMALIA

No.	Name	Region	District	Co-ords.	Altitude (m)	Quoted Area (km2)	Min. Forest Area (km2)	Size Class	Status	Land Ownership	Conservation Proposals	Conservation Measures Taken
1	Shoonto	Southern	Bu'aale - Fanoole	0104N 4236E	0 - 20	3	?	?	FR	Govt	proposed NP	
2	Barako Madow	Southern	Bu'aale - Fanoole	0108N 4236E	0 - 20	1	?	?	FR	Govt	proposed NP	
3	Boni	Southern	?	?	?	? large	?	?	?	?	?	?
						TOTAL:	0					

SITES: MOZAMBIQUE

No.	Name	Province	District	Co-ords.	Altitude (m)	Quoted Area (km2)	Min. Forest Area (km2)	Size Class	Status	Land Ownership	Conservation Proposals	Conservation Measures Taken
214	Bazaruto	Inhambane	Bazaruto	?	0	< 100	50	5	NP	Govt	tourism	protected by villagers
215	Dondo	Manica e Sofala	Dondo	1937S 3445E	50	1	1	2	chiefs' burial ground	?		
216	Dombe	Manica e Sofala	Manica	1958S 3323E	200	5	5	3	none	?		
217	Nangade	Cabo Delgado	Nangade	1110S 3970E	?	> 100	100	5	none	?		
218	Negomano	Cabo Delgado	Nagomano	1148S 3853E	?	> 100	100	5	none	?		
219	Mueda	Cabo Delgado	Mueda	1170S 3950E	?	> 100	100	5	none	?		
220	Nairoto	Cabo Delgado	Nairoto	1255S 3907E	?	> 100	100	5	none	?		
221	Namapa	Nampula	Namapa	1375S 3975E	?	> 100	100	5	none	?		
222	Balkopinda	NE Nampula	Memba	1413S 4042E	100 - 200	190	100	5	F R	Govt		
223	Mecuburi	NE Nampula	Mecuburi	1433S 3900E	300 - 500	2,300	800	5	F R	Govt		
224	Matibane	NE Nampula	Nakala	1436S 4048E	100 - 200	199	100	5	F R	Govt		
225	Muecate	Nampula	Muecate	1500S 3950E	?	> 100	100	5	none	?		
226	Inhamitanga	Manica e Sofala	Cheringoma	1815S 3515E	100	8	8	3	Proposed FR	Govt	management plan	
227	Chinhongue forest, Benguera Is.	Inhambane	?	2151S 3525E	2 - 15	20	10	3	N P	Govt. (and Hotel)	implement man. plan	
228	Mabote	Inhambane	Mabote	2230S 3430E	0	> 100	100	5	Proposed FR	Govt	management plan	
242	Amatongas	Manica e Sofala	Gondola	1910S 3345E	400	5	5	3	none	?		
243	Serra Mocuta (Mavita)	Manica e Sofala	Manica	1928S 3308E	700	2	2	2		?		
244	Inhaca Island Dune Forest	Maputo	Maputo	2600S 3259E	10 - 40	9	9	3	Terrestrial Reserve	Govt		
						TOTAL:	1,790					

SITES: MALAWI

No.	Name	Region	District	Co-ords.	Altitude (m)	Quoted Area (km2)	Min. Forest Area (km2)	Size Class	Status	Land Ownership	Conservation Proposals	Conservation Measures Taken
229	S. Mulanje forests (incl. 247)	Southern	Mulanje	1600S 3539E	c. 800	2	2	2	?	?		
230	Malawi Hills (part of Matandwe FR)	Southern	Nsanje	1656S 3590E	900	4	4	2	FR	Govt.		
[245]	Kalwe (in 258)	Northern	Nkhata Bay	1137S 3415E	500	[2]	[2]	[2]	FR	Govt.		
[246]	Nkuwadzi Hill (in 258)	Northern	Nkhata Bay	1142S 3414E	700	[8]	[8]	[3]	FR	Govt.		
[247]	Ruo Gorge (in 229)	Southern	Mulanje	1600S 3539E	800	[2]	[2]	[2]	private	Lujeri Tea Estate		
258	Nkhata Bay forests (incl. 245, 246, others)	Northern	Nkhata Bay	1137S 3415E	500 - 700	10	10	3	mostly FR	mostly Govt.		
						TOTAL:	16					

SITES: ZIMBABWE

No.	Name	Province	District	Co-ords.	Altitude (m)	Quoted Area (km2)	Min. Forest Area (km2)	Size Class	Status	Land Ownership	Conservation Proposals	Conservation Measures Taken
231	Makurupini forest	Manicaland	Chimanimani	2002S 3301E	300 - 350	1.7	1.7	2	in Chimanimani NP	Govt	demarcation	
232	Haroni Botanic Reserve	Manicaland	Chimanimani	2002S 3301E	300 - 350	0.04	0.04	1	Botanic Reserve	Govt	demarcation; tourism	
233	Rusitu Botanic Reserve	Manicaland	Chimanimani	2002S 3301E	300 - 350	0.8	0.8	1	Botanic Reserve	Govt	demarcation; tourism	
248	Chiterna River	Manicaland	Nyanga	1823S 3254E	700	0.1	0.1	1	in Nyanga NP	Govt		
249	Rumbise Hill	Manicaland	Nyanga	1823S 3256E	780	0.15	0.15	1	Sacred Forest	communal land		
259	Pungwe Bridge	Manicaland	Nyanga	18??S 32??E	?	0.09	0.09	1	?	? communal land		
260	Lower Pungwe Valley fragments (excl. 259, 248, 2	Manicaland	Nyanga	18??S 32??E	?	?	?	?	?	? communal land		
						TOTAL:	3					

SITES: SOUTH AFRICA

No.	Name	Province	District	Co-ords.	Altitude (m)	Quoted Area (km2)	Min. Forest Area (km2)	Size Class	Status	Land Ownership	Conservation Proposals	Conservation Measures Taken
250	Nseleni sand forest	Natal	Ingwavuma	2658S 3226E	150	100	100	5		?		
251	Manguzi lowland forest	Natal	Ingwavuma	2658S 3244E	50	25	25	4		?		
252	Sodwana Bay dune forest	Natal	Ubombo	2733S 3240E	100	1	1	1	National Park	Govt.		
253	Ochre Hills dune forest	Natal	Ubombo	2743S 3237E	100	25	25	4		?		
254	Nyalazi dune forest	Natal	Hlabisa	2805S 3223E	100	25	25	4		?		
255	Cape Vidal dune forest	Natal	Hlabisa	2807S 3233E	100	4	4	1	State Forest	Govt.		
256	Dukuduku dune forest	Natal	Hlabisa	2822S 3213E	100	25	25	4	State Forest	Govt.		
257	Mapelane dune forest	Natal	Umfolozi	2824S 3226E	100	4	4	1	Nature Reserve	Provincial		
						TOTAL:	209					

1 = <1 km2
2 = 1 - 5 km2
3 = 5 - 15 km2
4 = 15 - 50 km2
5 = > 50 km2

APPENDIX 5:
SITES ARRANGED BY AREA

East African Coastal Forests: listed in order of size (page 1 of 2)

FORESTS OVER 50 SQ. KM ("Size Class 5"):

No.	Name	Country	Min. Forest Area (km2)	
17	Boni NR	KY	870	*
223	Mecuburi	MOZ	800	
9	North Kilifi Brachystegia woodlands (4 sites)	KY	500	*
21	Dodori NR	KY	415	*
54	Arabuko-Sokoke FR, NR & NP (incl. 55)	KY	370	
19	Boni prop FR	KY	184	*
16	Wayu I, Wayu II, Wayu III & Kokani forests	KY	112	
14	Ras Tenewi prop. CZNR (incl. 29,30,34,35, others)	KY	105	*
225	Muecate	MOZ	100	
224	Matibane	MOZ	100	
222	Baikopinda	MOZ	100	
250	Nseleni sand forest	S.A.	100	
228	Mabote	MOZ	100	
220	Nairoto	MOZ	100	
219	Mueda	MOZ	100	
217	Nangade	MOZ	100	
221	Namapa	MOZ	100	
218	Negomano	MOZ	100	
183	Ruvu South	TZ	98	
22	Lunghi prop FR	KY	96	*
108	Shimba Hills NR (incl. 106, 111, 113)	KY	63	
214	Bazaruto	MOZ	50	

FORESTS OF 15 - 50 SQ. KM ("Size Class 4")

No.	Name	Country	Min. Forest Area (km2)
143	Mafi Hill	TZ	45
163	Msubugwe	TZ	44.08
138	Kichi Hills	TZ	40
50	Mangea Hill	KY	35
171	Pagale Hill	TZ	32
180	Ruvu	TZ	30.93
165	Mtunguru	TZ	29.32
164	Gendagenda (South and North)	TZ	28
167	Kwasumba	TZ	28
178	Kitulang'alo	TZ	26.38
206	Rondo (incl. 139)	TZ	25
256	Dukuduku dune forest	S.A.	25
251	Manguzi lowland forest	S.A.	25
254	Nyalazi dune forest	S.A.	25
253	Ochre Hills dune forest	S.A.	25
186	Kazimzumbwe	TZ	23.5
191	Kiwengoma ("Matumbi")	TZ	22
170	Kiono / Zaraninge	TZ	20
162	Mgambo	TZ	20
33	Tana Delta (incl. 32)	KY	20
211	Mtiniko / Mnivata	TZ	17
70	Taru & Kilisa Hills	KY	16
127	Marenji FR	KY	15

FORESTS OF 5 - 15 SQ. KM ("Size Class 3")

No.	Name	Country	Min. Forest Area (km2)
146	Ngezi	TZ	14.4
27	Witu FR (incl. 28)	KY	14
95	Maluganji FR (incl. 96)	KY	14
192	Namakutwa-Nyamuete	TZ	12
149	Segoma	TZ	11
20	Tana River Primate NR	KY	11
148	Kambai Public Lands	TZ	11
193	Ton'gombe	TZ	11
179	Pande	TZ	11
258	Nkhata Bay forests (incl. 245, 246, others)	MAL	10
227	Chinhongue forest, Benguera Is.	MOZ	10
185	Vikindu	TZ	10
195	Pindiro / Bwatabwata	TZ	10
25	Lower Tana gallery forests (30+ patches, incl. 26)	KY	10
5	Palm woodland, Ramisi (3 patches)	KY	10
147	Kwamgumi	TZ	10
137	Bagala	TZ	10
160	Kwani	TZ	10
181	Pugu	TZ	10
173	Muyuni	TZ	10
168	Mkwaja	TZ	10
244	Inhaca Island Dune Forest	MOZ	9
226	Inharnitanga	MOZ	8
150	Kambai FR	TZ	8
197	Mselezi	TZ	7.71
207	Ziwani	TZ	7.7
169	Magotwe	TZ	7.09
196	Mbinga	TZ	7
161	Handeni Hill	TZ	6.77
119	Gongoni FR	KY	6.35
208	Nyangamara	TZ	6
122	Buda Mafisini FR	KY	6
204	Chitoa	TZ	6
129	Gonja FR (incl. 131)	KY	6
240	Kaya Rabai (incl. 15, 84, 85, 89, 5 others)	KY	5.6
184	Kimboza	TZ	5.05
152	Marimba	TZ	5
216	Dombe	MOZ	5
205	Litipo	TZ	5
133	Shimoni forest	KY	5
242	Amatongas	MOZ	5
37	Dakabuko Hill	KY	5

FORESTS OF 1 - 5 SQ. KM ("Size Class 2")

No.	Name	Country	Min. Forest Area (km2)
4	Kilibasi hill	KY	4
144	Mtapwa	TZ	4
255	Cape Vidal dune forest	S.A.	4
230	Malawi Hills (part of Matandwe FR)	MAL	4
257	Mapelane dune forest	S.A.	4
153	Mkulumuzi Gorge and Amboni Caves	TZ	3.5
198	Mitundumbea	TZ	3
210	Mtuli / Hinju	TZ	3
172	Jozani / Unguju	TZ	3
156	Tongwe	TZ	3
177	Dindili	TZ	3
189	Mrora	TZ	3
155	Kojani Island	TZ	3
121	Jombo FR (incl. 118)	KY	2.92
125	Mrima FR (incl. 124)	KY	2.9
12	Mwache FR	KY	2.85
145	Msitu Mkuu	TZ	2.5
72	Kaya Chonyi/Achonyi FR (incl. 74, 76)	KY	2
188	Mchungu	TZ	2
174	Kilandiw Hill	TZ	2
229	S. Mulanje forests (incl. 247)	MAL	2
176	Ruvu North	TZ	2
243	Serra Mocuta (Mavita)	MOZ	2
187	Kisiju / Dendene	TZ	2
154	Yambe Island	TZ	2
231	Makurupini forest	ZIM	1.7
141	Kilulu Hill ("Moa")	TZ	1.6
175	Msavula Hill	TZ	1.5
77	Kaya Jibana FR	KY	1.5
92	Kaya Gandini / Takawa / Duruma	KY	1.5
94	Kaya Chonyi (Jivani)	KY	1.5
67	Kaya Kivara	KY	1.5
159	Pangani Falls	TZ	1.5
115	Kaya Muhaka / Kambe / Mwadabara NM	KY	1.5
100	Kaya Lunguma	KY	1.5
117	Mwereni Brachystegia woodland	KY	1.4
93	Kaya Mtswakara	KY	1.2
103	Kaya Teleza / Dugumura Hill SG	KY	1
39	Ras Ngomeni dune forest & woodland	KY	1
40	Devil's / Hell's Kitchen	KY	1
7	Bura gallery forests (incl. Nanigi & Chewele)	KY	1
252	Sodwana Bay dune forest	S.A.	1
215	Dondo	MOZ	1
130	Chuna gallery forest	KY	1
45	Kayas Dagamura, Starehe & Kilulu	KY	1
82	Kaya Ribe (incl. K. Ribe FR)	KY	1
90	Kaya Kauma	KY	1
49	Nyari at Jilore	KY	1
31	Kanwe Mayi forest fragments (5 - 7 patches)	KY	1
18	Mbia	KY	1
265	Lunga Lunga gallery forest	KY	1

East African Coastal Forests: listed in order of size (page 2 of 2)

FORESTS UNDER 1 SQ. KM ("Size Class 1")

No.	Name	Country	Min. Forest Area (km2)
71	Kaya Fungo / Giriama	KY	0.9
140	Horohoro	TZ	0.8
116	Diani / Jadini Forest	KY	0.8
233	Rusitu Botanic Reserve	ZIM	0.8
132	Miongoni gallery forest	KY	0.7
79	Kaya Kambe / Mbwaka Kaya & FR	KY	0.6
123	Kaya Chale / Chale Island SG NM	KY	0.5
166	Mbuzini	TZ	0.5
128	Kaya Sega NM	KY	0.5
80	Pangani Rocks Sacred Grove	KY	0.5
46	Kaya Bura	KY	0.5
13	Kitovu	KY	0.5
157	Mgelema	TZ	0.45
158	Jambangombe	TZ	0.45
41	Kaya Bore (incl. / adj. 42)	KY	0.4
52	Gede Ruins	KY	0.35
120	Kaya Ngalaani/Kinondo NM	KY	0.3
73	Mwarakaya Sacred Grove	KY	0.25
78	Kaya Tsolokero	KY	0.25
58	Kambe Rocks Sacred Grove	KY	0.25
48	Kaya Bate	KY	0.25
99	Kaya Chitanze / Kitsantse forest	KY	0.25
44	Kaya Kirimani	KY	0.25
105	Kaya Miyani	KY	0.2
69	Cha Simba Sacred Grove	KY	0.2
114	Kaya Ukunda NM	KY	0.2
112	Kaya Diani NM	KY	0.2
11	Malindi Point Sacred Grove	KY	0.2
102	Kaya Kiteje NM	KY	0.15
107	Kaya Waa NM	KY	0.15
249	Rumbise Hill	ZIM	0.15
134	Kaya Jego NM	KY	0.11
261	Kaya Mvumoni	KY	0.108
241	Kirima Cha Mpepe Sacred Grove	KY	0.1
43	Kaya Singwaya	KY	0.1
47	Lower Sabaki Wetlands (various sites)	KY	0.1
248	Chitema River	ZIM	0.1
8	Kaya Galu/Ganzoni NM	KY	0.1
98	Kaya Shonda	KY	0.1
88	Jumba la Mtwana NM	KY	0.1
83	Kombeni River Gorge	KY	0.1
36	Dakawachu Hill	KY	0.1
104	Similani Caves Sacred Grove	KY	0.1
51	Kibongo Hill	KY	0.1
68	Dzitsoni Caves	KY	0.1
239	Kaya Maiowe	KY	0.1
238	Kaya Madunguni	KY	0.1
56	Rare River Gorge	KY	0.1
75	Vipingo Caves Sacred Grove	KY	0.1
60	Njora River Gorge	KY	0.1
61	North of Jaribuni forest patch	KY	0.1

Continued on next column ...

Continued from previous column ...

57	Nyari S.W. of Arabuko-Sokoke	KY	0.1
259	Pungwe Bridge	ZIM	0.09
135	Shimoni Cave Sacred Grove NM	KY	0.05
101	Kaya Bombo NM	KY	0.05
136	Kaya Bogowa NM	KY	0.05
53	Pangayambo Caves Sacred Grove	KY	0.05
87	Mtwapa NM	KY	0.05
59	Mulungu Mawe & Bikisaga SG	KY	0.05
110	Kaya Tiwi NM	KY	0.05
232	Haroni Botanic Reserve	ZIM	0.04
64	Kaya Starehe	KY	0.01
62	Nyari at Mjibu	KY	0.01
65	Ndzovuni River Gorge	KY	0.01
66	Vyambani cliffs	KY	0.01
63	Mnarani	KY	0.01
194	Nangoma	TZ	0.01
190	Kilindoni	TZ	0.01
182	Gongolamboto	TZ	0.01
91	Nguu Tatu hill	KY	0.01
97	Kaya Ngyorani	KY	0
109	Simkumbe forest patch	KY	?
201	Ndimba	TZ	?
200	Rungo	TZ	?
81	Mariakani west forests (Kumbulu & Gobwe)	KY	?
236	Kaya Chilulu	KY	?
237	Kaya Kinangoni	KY	?
142	Ras Kiuyu	TZ	?
126	Kaya Msambweni	KY	?
199	Ngarama	TZ	?
203	Matapwa	TZ	?
202	Ruawa	TZ	?
38	Werune Cliffs	KY	?
263	Kaya Pungu / Mvuakani	KY	?
10	Kaya Kidzini	KY	?
6	Kiunga Marine NR (incl. 23, 24)	KY	?
260	Lower Pungwe Valley (excl. 259, 248, 249)	ZIM	?
1	Shoonto	SOM	?
213	Namikupula	TZ	?
212	Mahuta	TZ	?
262	Mwamungu forest patch	KY	?
86	Mtwapa Creek north bank	KY	?
264	Kaya Mlele	KY	?
2	Barako Madow	SOM	?
3	Boni	SOM	?
209	Chilangala	TZ	?

SECONDARY SITES (ie. included in the above areas)

No.	Name	Country	Min. Forest Area (km2)
[96]	Kaya Mtai / Mtae NM (in 95)	KY	[?]
[55]	Nyari within Arabuko-Sokoke (in 54)	KY	[?]
[118]	Kaya Dzombo NM (in 121)	KY	[?]
[106]	Kaya Kwale / Digo NM (in 108)	KY	[?]
[74]	Kaya Vuga (in 72)	KY	[?]
[131]	Kaya Gonja/Mwalewa NM (in 129)	KY	[?]
[124]	Kaya Mrima / Mrima Hill SG NM (in 125)	KY	[?]
[42]	Ulaya Nyari at Bore (in / adj. 41)	KY	[?]
[246]	Nkuwadzi Hill (in 258)	MAL	[8]
[139]	Rondo extension (adj. 206)	TZ	[7]
[85]	Kaya Bomu (in 240)	KY	[3]
[245]	Kalwe (in 258)	MAL	[2]
[247]	Ruo Gorge (in 229)	MAL	[2]
[89]	Kaya Mwidzimwiru (in 240)	KY	[1]
[32]	Rain Tree forest (in 33)	KY	[1]
[84]	Kaya Fimboni (in 240)	KY	[1.5]
[113]	Mkongani West FR (adj. 108)	KY	[13]
[111]	Mkongani North FR (adj. 108)	KY	[11]
[28]	Witu FR extension (adj. 27)	KY	[0.9]
[76]	Kaya Koyeni (in 72)	KY	[0.5]
[23]	Mvundeni Village (in 6)	KY	[0.1]
[24]	Ashuweni Village & Tombs (in 6)	KY	[0.1]
[15]	Kaya Mudzimuvia (in 240)	KY	[0.1]
[26]	Mlango ya Simba Bridge (in 25)	KY	[0.1]
[30]	Famau Ruins & Famau Hill (in 14)	KY	[0.1]
[34]	Shaka Ruins NM (in 14)	KY	[0.1]
[29]	Kiponozi Ruins NM & Wells (in 14)	KY	[0.1]
[35]	Ras ya Wanawali Sabaa Tombs NM (in 14)	KY	[0.1]

APPENDIX 6:
USES OF COASTAL FORESTS

East African Coastal Forests

USES: KENYA

No.	Name	Surrounding Land Use	None	Mech. Logging	Wildlife Cons.	Charcoal	Hunting	Research	Religion / History	Pole Supply	Pit--Sawing	Agri--culture	Tourism	Water Supply	Recreation	Trad. Medecine	Other
4	Kilibasi hill	AG?				+	+		+	+++			+	+		+	
5	Palm woodland, Ramisi (3 patches)	AG				+	+			+		+					
6	Kiunga Marine NR (incl. 23, 24)	AG															
7	Bura gallery forests (inc. Nanigi & Chewele)	AG				+	+		+	+		+				+	
8	Kaya Galu/Ganzoni NM	AG				+			+	+		+				+	
9	North Kilifi Brachystegia woodlands (4 sites)	AG				+++				+	++	++					
10	Kaya Kidzini	?	NO DATA						+								
11	Malindi Point Sacred Grove					+			+	++						+	Cleared for tourist housing dev.
12	Mwache FR	AG, quarry		++						+	+						
13	Kitovu	AG		+						+	+						
14	Ras Tenewi prop. CZNR (incl. 29,30,34,35, others)	AG			++	+	+			+		+					
[15]	Kaya Mudzimuvia (in 240)					+	+		+	+	+	+				+	
16	Wayu I, Wayu II, Wayu III & Kokani forests	?	NO DATA														
17	Boni NR				+		++										Bandit refuge
18	Mbia	AG				+			+	+						+	
19	Boni prop FR					+	+			+	+	+					
20	Tana River Primate NR	AG			+++			+	+	++	+	+				+	
21	Dodori NR				+		+										
22	Lunghi prop FR					+	+			+	+	+					
[23]	Mvundeni Village (in 6)	SEE: 6															
[24]	Ashuweni Village & Tombs (in 6)	SEE: 6															
25	Lower Tana gallery forests (30+ patches, incl. 26)	AG				+	+		+	+	+					+	
[26]	Mlango ya Simba Bridge (in 25)	AG								+	+						
27	Witu FR (incl. 28)	AG		+		+				+	+						
[28]	Witu FR extension (adj. 27)	AG				+				+	+						
[29]	Kiponozi Ruins NM & Wells (in 14)	SEE: 14															
[30]	Famau Ruins & Famau Hill (in 14)	SEE: 14															
31	Kanwe Mayi forest fragments (5 - 7 patches)	AG				+	+			+	+						
[32]	Rain Tree forest (in 33)	AG								+							
33	Tana Delta (incl. 32)	AG			+	+		+		+	+	+	+				
[34]	Shaka Ruins NM (in 14)	SEE: 14															
[35]	Ras ya Wanawali Sabaa Tombs NM (in 14)	SEE: 14															
36	Dakawachu Hill	AG															
37	Dakabuko Hill	AG								+							
38	Werune Cliffs	?	NO DATA														
39	Ras Ngomeni dune forest & woodland	AG				+				+	+	++					
40	Devil's / Hell's Kitchen	AG							+				+			+	
41	Kaya Bore (incl. / adj. 42)	AG							+	+		+				+	
[42]	Ulaya Nyari at Bore (in / adj. 41)	AG							+	+						+	
43	Kaya Singwaya	?	NO DATA														
44	Kaya Kirimani	?	NO DATA														
45	Kayas Dagamura, Starehe & Kilulu	AG							+	+		+				+	
46	Kaya Bura	AG							+	+		+				+	
47	Lower Sabaki Wetlands (various sites)	AG										+					
48	Kaya Bate	AG							+	+		+				+	
49	Nyari at Jilore	AG				+			+	+	+	+		+		+	
50	Mangea Hill	AG				+	+		+	+	++	+		+		+	
51	Kibongo Hill	AG				+				+	+	+					Housing for tourists
52	Gede Ruins	AG							+++				+++				
53	Pangayambo Caves Sacred Grove	AG										+	++				
54	Arabuko-Sokoke FR, NR & NP (incl. 55)	AG		++			+	++		++	+		+		+		
[55]	Nyari within Arabuko-Sokoke (in 54)	SEE: 54															
56	Rare River Gorge	AG				+				+	+	+		+			
57	Nyari S.W. of Arabuko-Sokoke	AG										+		+			

USES

58	Kambe Rocks Sacred Grove	AG							+	+	+	+		+		+	Quarry
59	Mulungu Mawe & Bikisaga SG	AG							+	+		+		+		+	
60	Njora River Gorge	AG								+	+	+		+		+	
61	North of Jaribuni forest patch	AG	NO DATA														
62	Nyari at Mjibu	AG	NO DATA														
63	Mnarani	AG							+++				++				
64	Kaya Starehe		NO DATA														
65	Ndzovuni River Gorge	AG				+				+	+	+		+			
66	Vyambani cliffs	AG				+				+						+	
67	Kaya Kivara	AG				+			+	+	+++	+				+	
68	Dzitsoni Caves	AG	NO DATA	(possible site for rare bats)													
69	Cha Simba Sacred Grove	AG							++	+	+	+	+			+	
70	Taru & Kilisa Hills	AG				+				+	+						Quarry
71	Kaya Fungo / Giriama	AG							++	+	+	+				+	
72	Kaya Chonyi/Achonyi FR (incl. 74, 76)	AG							++	+	+	+				+	
73	Mwarakaya Sacred Grove	AG							+	+	+	+				+	
[74]	Kaya Vuga (in 72)	SEE: 72															
75	Vipingo Caves Sacred Grove	AG			++				+	+							
[76]	Kaya Koyeni (in 72)	SEE: 72															
77	Kaya Jibana FR	AG							++	+	++	++		++		+	
78	Kaya Tsolokero	AG	NO DATA														
79	Kaya Kambe / Mbwaka Kaya & FR	AG							++	+	+	+		+			Quarry
80	Pangani Rocks Sacred Grove	AG							++	+	+	+				+	Quarry
81	Mariakani west forests (Kumbulu & Gobwe)	AG	NO DATA														
82	Kaya Ribe (incl. K. Ribe FR)	AG							++	+		+				+	
83	Kombeni River Gorge	AG								+	+	+		+			
[84]	Kaya Fimboni (in 240)	AG							++	+	+					+	
[85]	Kaya Bomu (in 240)	AG							++	+	+					+	
86	Mtwapa Creek north bank	AG	NO DATA														
87	Mtwapa NM	AG / honey							++				+				
88	Jumba la Mtwana NM	AG / honey							++				++				
[89]	Kaya Mwidzimwiru (in 240)	AG							++	+		+				+	
90	Kaya Kauma	AG							++	+	+	+					Mining
91	Nguu Tatu hill	AG	NO DATA														
92	Kaya Gandini / Takawa / Duruma	AG							++	+	+					+	
93	Kaya Mtswakara	AG							++	+	+					+	
94	Kaya Chonyi (Jivani)	AG							+	+		+				+	
95	Maluganji FR (incl. 96)	AG							+	++	++						
[96]	Kaya Mtai / Mtae NM (in 95)	SEE: 95															
97	Kaya Ngyorani		NO DATA														
98	Kaya Shonda	AG							++	+						+	Quarry
99	Kaya Chitanze / Kitsantse forest	AG							+	+	+		+				
100	Kaya Lunguma	AG							+	+						+	
101	Kaya Bombo NM	AG				+			+	+	+	+				+	
102	Kaya Kiteje NM	AG							+			+					
103	Kaya Teleza / Dugumura Hill SG	AG							+	+		+				+	
104	Similani Caves Sacred Grove	AG			+++				++	+		+	+				Quarry. (Rare bats in caves)
105	Kaya Miyani	AG							+	+		+					
[106]	Kaya Kwale / Digo NM (in 108)	SEE: 108															
107	Kaya Waa NM	AG							++	+	+	+					Housing
108	Shimba Hills NR (incl. 106, 111, 113)	AG & none		++	+++			++	+	+	+		+++	++	+	+	
109	Simkumbe forest patch	?	NO DATA														
110	Kaya Tiwi NM	AG							++	+	+	+					Housing
[111]	Mkongani North FR (adj. 108)	AG		+						+	+						
112	Kaya Diani NM	AG							++	+						+	Housing
[113]	Mkongani West FR (adj. 108)	AG		++						+	+						
114	Kaya Ukunda NM	AG							++	+	+	+				+	Housing
115	Kaya Muhaka / Kambe / Mwadabara NM	AG							++	+	+	+				+	
116	Diani / Jadini Forest	AG								+	+	+	++			+	Hotels / Housing
117	Mwereni Brachystegia woodland	AG	NO DATA														
[118]	Kaya Dzombo NM (in 121)	SEE: 121															
119	Gongoni FR	AG		++				+		+	+			+			

USES

120	Kaya Ngalaani/Kinondo NM	AG							++	++	+					+	
121	Jombo FR (incl. 118)	AG							+	+	++	+				+	
122	Buda Mafisini FR	AG		++				+		+	++				+		
123	Kaya Chale / Chale Island SG NM								++	+			++		+		
[124]	Kaya Mrima / Mrima Hill SG NM (in 125)	SEE: 125															
125	Mrima FR (incl. 124)	AG		++					+	+	+					+	Mining
126	Kaya Msambweni	?	NO DATA														
127	Marenji FR	AG		++						+	++			+			
128	Kaya Sega NM	AG							++	+						+	
129	Gonja FR (incl. 131)	AG		++					+	+	++						
130	Chuna gallery forest	AG								+	+	+++					
[131]	Kaya Gonja/Mwalewa NM (in 129)	SEE: 129															
132	Miongoni gallery forest	AG								+	+	++					
133	Shimoni forest	AG								+	+	++					Housing
134	Kaya Jego NM	AG							++	+		+				+	
135	Shimoni Cave Sacred Grove NM	Tourism			++				+	+			++				Housing. (Rare bats in caves)
136	Kaya Bogowa NM	AG							+	+		+			+++		Fishing boat manufacture
236	Kaya Chilulu	?	NO DATA														
237	Kaya Kinangoni	?	NO DATA														
238	Kaya Madunguni	?	NO DATA														
239	Kaya Maiowe	?	NO DATA														
240	Kaya Rabai (incl. 15, 84, 85, 89, 5 others)	SEE: 15, 84, 85, 89															
241	Kirima Cha Mpepe Sacred Grove	?	NO DATA														
261	Kaya Mvumoni																
262	Mwamungu forest patch	?	NO DATA														
263	Kaya Pungu / Mvuakani	AG			++				++	+						+	(Rare bats in cave)
264	Kaya Mlele	?	NO DATA														
265	Lunga Lunga gallery forest	?	NO DATA														

USES: TANZANIA

No.	Name	Surrounding Land Use	None	Mech. Logging	Wildlife Cons.	Charcoal	Hunting	Research	Religion / History	Pole Supply	Pit- -Sawing	Agri- -culture	Tourism	Water Supply	Recreation	Trad. Medecine	Other
137	Bagala	?	NO DATA														
138	Kichi Hills	?	NO DATA														
[139]	Rondo extension (adj. 206)	?	NO DATA														
140	Horohoro	AG	+++							+							
141	Kilulu Hill ("Moa")	grazing	+++				+		+			++				+	
142	Ras Kiuyu	?	NO DATA														
143	Mafi Hill	?	NO DATA														
144	Mtapwa	Town; AG			?												
145	Msitu Mkuu	?	NO DATA														
146	Ngezi	AG															
147	Kwamgumi	AG					++				++			++		++	
148	Kambai Public Lands	Salt ? ; AG					+++				++	++				++	
149	Segoma	AG					++				++			++		++	
150	Kambai FR	AG					++				++	+		+++		++	
152	Marimba	AG			++		++				++			+++		++	
153	Mkulumuzi Gorge and Amboni Caves	?	++								+	+	++	+			Quarry (Limestone) ++
154	Yambe Island	?					+					+					
155	Kojani Island	AG ?	++														
156	Tongwe	AG; woodland					+				+						
157	Mgelema	AG; past cons.			+	++		+									
158	Jambangombe	?	+++						++								
159	Pangani Falls	Hydroelectricity; AG	+++				+		+					+++		+	
160	Kwani	AG	++									++					
161	Handeni Hill	AG															
162	Mgambo	?															
163	Msubugwe	AG				+	+			++	++						
164	Gendagenda (South and North)	AG					+		++		+	+		++			Railway +
165	Mtunguru	?															
166	Mbuzini	?															
167	Kwasumba	?	NO DATA														
168	Mkwaja	Ranch / private GR	++														Firewood for salt production ++
169	Magotwe	AG															
170	Kiono / Zaraninge	GR; AG	++	+	+		++	+				++				+	
171	Pagale Hill	?	NO DATA														
172	Jozani / Unguju	AG		++	+++			+					++				
173	Muyuni	AG															
174	Kilandiw Hill	?	NO DATA														
175	Msavula Hill	?	NO DATA														
176	Ruvu North	?				+++		+						++			Plantation ++
177	Dindili	?	NO DATA														
178	Kitulang'alo	?	NO DATA														
179	Pande	AG			+	+++				+++	++			+		+	
180	Ruvu	?															
181	Pugu	AG				++	++			+++	++			++	+	++	mining +++
182	Gongolamboto	town							+++								graveyard +++
183	Ruvu South	AG					+								+		
184	Kimboza	AG						++									
185	Vikindu	AG				++	+			+++	+						
186	Kazimzumbwe	AG					+			+++	++			++		++	
187	Kisiju / Dendene	AG						+		+		+++					
188	Mchungu	AG							+		+						
189	Mrora	AG			+		++	+		++		+++					windbreak ++
190	Kilindoni	town			+												stabilise soil; pump station gr +++
191	Kiwengoma ("Matumbi")	AG	+		+		++		+		+++			++		+++	
192	Namakutwa-Nyamuete	AG	++													+	
193	Ton'gombe	AG	++		+				+		+			++		+	
194	Nangoma	AG							+++				+				

USES

195	Pindiro / Bwatabwata	?	NO DATA													
196	Mbinga	?	NO DATA													
197	Mselezi	?	NO DATA													
198	Mitundumbea	?	NO DATA													
199	Ngarama	AG	++				++			+	+					+	
200	Rungo	?	NO DATA													
201	Ndimba	?	NO DATA													
202	Ruawa	?	NO DATA													
203	Matapwa	?	NO DATA													
204	Chitoa	AG	+++				+			+						+	
205	Litipo	AG; Plantation	++				++			+				+		+	
206	Rondo (incl. 139)	AG	++		+		++	+		+				++		+	plantation ++
207	Ziwani	AG	+++		+		+				+			++		+	"minor forest products" +
208	Nyangamara	AG; Plantation	++				+			+						+	
209	Chilangala	?	NO DATA														
210	Mtuli / Hinju	AG	+++		+		+				+			++		+	beekeeping; other +
211	Mtiniko / Mnivata	AG	+++		+	+								++		+	beekeeping; other +
212	Mahuta	?	NO DATA														
213	Namikupula	?	NO DATA														

USES: SOMALIA

No.	Name	Surrounding Land Use	None	Mech. Logging	Wildlife Cons.	Charcoal	Hunting	Research	Religion / History	Pole Supply	Pit- -Sawing	Agri- -culture	Tourism	Water Supply	Recreation	Trad. Medecine	Other
1	Shoonto	AG					++			+							
2	Barako Madow	AG					++			+							
3	Boni	?	NO DATA														

USES: MOZAMBIQUE

No.	Name	Surrounding Land Use	None	Mech. Logging	Wildlife Cons.	Charcoal	Hunting	Research	Religion / History	Pole Supply	Pit- -Sawing	Agri- -culture	Tourism	Water Supply	Recreation	Trad. Medecine	Other
214	Bazaruto	?	NO DATA														
215	Dondo	?	NO DATA														
216	Dombe	?	NO DATA														
217	Nangade	?	NO DATA														
218	Negomano	?	NO DATA														
219	Mueda	?	NO DATA														
220	Nairoto	?	NO DATA														
221	Namapa	?	NO DATA														
222	Baikopinda	AG										+++					
223	Mecuburi	AG		+					+			++				+	
224	Matibane	AG															
225	Muecate	?	NO DATA														
226	Inhamitanga	?	NO DATA														
227	Chinhongue forest, Benguera Is.	AG; villages											+++				
228	Mabote	?	NO DATA														
242	Amatongas	?	NO DATA														
243	Serra Mocuta (Mavita)	?	NO DATA														
244	Inhaca Island Dune Forest	?	NO DATA														

USES: MALAWI

No.	Name	Surrounding Land Use	None	Mech. Logging	Wildlife Cons.	Charcoal	Hunting	Research	Religion / History	Pole Supply	Pit- -Sawing	Agri- -culture	Tourism	Water Supply	Recreation	Trad. Medecine	Other
229	S. Mulanje forests (incl. 247)	?	NO DATA														
230	Malawi Hills (part of Matandwe FR)	?	NO DATA														
[245]	Kalwe (in 258)	?	NO DATA														
[246]	Nkuwadzi Hill (in 258)	?	NO DATA														
[247]	Ruo Gorge (in 229)	?	NO DATA														
258	Nkhata Bay forests (incl. 245, 246, others)	?	NO DATA														

USES: ZIMBABWE

No.	Name	Surrounding Land Use	None	Mech. Logging	Wildlife Cons.	Charcoal	Hunting	Research	Religion / History	Pole Supply	Pit- -Sawing	Agri- -culture	Tourism	Water Supply	Recreation	Trad. Medecine	Other
231	Makurupini forest	?	NO DATA														
232	Haroni Botanic Reserve	AG			+++							++	+				
233	Rusitu Botanic Reserve	AG			+++							++	+				
248	Chitema River	?	NO DATA														
249	Rumbise Hill	?	NO DATA														
259	Pungwe Bridge	?	NO DATA														
260	Lower Pungwe Valley fragments (excl. 259, 248, 2	?	NO DATA														

USES: SOUTH AFRICA

No.	Name	Surrounding Land Use	None	Mech. Logging	Wildlife Cons.	Charcoal	Hunting	Research	Religion / History	Pole Supply	Pit- -Sawing	Agri- -culture	Tourism	Water Supply	Recreation	Trad. Medecine	Other
250	Nseleni sand forest	?	NO DATA														
251	Manguzi lowland forest	?	NO DATA														
252	Sodwana Bay dune forest	?	NO DATA														
253	Ochre Hills dune forest	?	NO DATA														
254	Nyalazi dune forest	?	NO DATA														
255	Cape Vidal dune forest	?	NO DATA														
256	Dukuduku dune forest	?	NO DATA														
257	Mapelane dune forest	?	NO DATA														

APPENDIX 7:
THREATS TO COASTAL FORESTS

East African Coastal Forests

THREATS: KENYA

No.	Name	Agriculture	Plantation Forestry	Pit-Sawing	Pole Cutting	Charcoal	Fuelwood Collection	Mechanical Logging	Fire	Mining / Quarrying	Loss of Trad. Beliefs	Hunting	Built Development	Other
4	Kilibasi hill			+	+	+++	+		+		+	+		
5	Palm woodland, Ramisi (3 patches)	+							+					
6	Kiunga Marine NR (incl. 23, 24)	+						+						
7	Bura gallery forests (inc. Nanigi & Chewele)	+			+	+	+++							
8	Kaya Galu/Ganzoni NM	+			+	+	+		+		+		+	
9	North Kilifi Brachystegia woodlands (4 sites)	+		+	+	+	+							
10	Kaya Kidzini	NO DATA												
11	Malindi Point Sacred Grove	+			++	+	++		+		+		++	
12	Mwache FR				++		++	+		++				
13	Kitovu	+			+	+	+							
14	Ras Tenewi prop. CZNR (incl. 29,30,34,35, others)	+			+	+	+							
[15]	Kaya Mudzimuvia (in 240)	+		+	+		+				+			
16	Wayu I, Wayu II, Wayu III & Kokani forests	NO DATA												
17	Boni NR			+								+		Bandits
18	Mbia	+			+		+				+			
19	Boni prop FR	+		+	+	+	+							
20	Tana River Primate NR	+		+	+		+		+		+			
21	Dodori NR				+	+	+					+		Bandits
22	Lunghi prop FR	+		+	+	+	+					+		Bandits
[23]	Mvundeni Village (in 6)	SEE: 6												
[24]	Ashuweni Village & Tombs (in 6)	SEE: 6												
25	Lower Tana gallery forests (30+ patches, incl. 26)	+++			+	+	+				+			
[26]	Mlango ya Simba Bridge (in 25)	++			+		+						++	(development = roads)
27	Witu FR (incl. 28)	+		+	+		+	+	++					
[28]	Witu FR extension (adj. 27)	+++		+	+	+	+		++					
[29]	Kiponozi Ruins NM & Wells (in 14)	SEE: 14												
[30]	Famau Ruins & Famau Hill (in 14)	SEE: 14												
31	Kanwe Mayi forest fragments (5 - 7 patches)	+		+	+	+	+							
[32]	Rain Tree forest (in 33)	+												Aquaculture
33	Tana Delta (incl. 32)	+			+		+							Aquaculture
[34]	Shaka Ruins NM (in 14)	SEE: 14												
[35]	Ras ya Wanawali Sabaa Tombs NM (in 14)	SEE: 14												
36	Dakawachu Hill	+												
37	Dakabuko Hill	+		+	+	+	+							
38	Werune Cliffs	NO DATA												
39	Ras Ngomeni dune forest & woodland	++			+	+	+						+	(develop. = housing for VIPs/tourists)
40	Devil's / Hell's Kitchen	++			+		+				+			erosion
41	Kaya Bore (incl. / adj. 42)	+			+		+				+			erosion
[42]	Ulaya Nyari at Bore (in / adj. 41)	SEE: 41												
43	Kaya Singwaya	NO DATA												
44	Kaya Kirimani	NO DATA												
45	Kayas Dagamura, Starehe & Kilulu	+			+	+	+				+			
46	Kaya Bura	+			+	+	+				+			
47	Lower Sabaki Wetlands (various sites)	++												
48	Kaya Bate	+			+	+	+				+			erosion
49	Nyari at Jilore	+		+	+	+	+				+			
50	Mangea Hill	++		+	+	+	+				+			
51	Kibongo Hill	++			+	+	+						+	
52	Gede Ruins										+			
53	Pangayambo Caves Sacred Grove	+			+									Cutting wood for carving
54	Arabuko-Sokoke FR, NR & NP (incl. 55)		+	+	+		+	++						
[55]	Nyari within Arabuko-Sokoke (in 54)	SEE: 54											++	Water Main
56	Rare River Gorge	++			+	+	+							Erosion
57	Nyari S.W. of Arabuko-Sokoke	+			+		+				+			

THREATS

58	Kambe Rocks Sacred Grove	+		+	+		+			+	+			(quarry = marble)
59	Mulungu Mawe & Bikisaga SG													
60	Njora River Gorge	+			+		+						++	Water Main
61	North of Jaribuni forest patch	NO DATA												
62	Nyari at Mjibu	+			+		+							Erosion
63	Mnarani													(PROTECTED)
64	Kaya Starehe	NO DATA												
65	Ndzovuni River Gorge	+			+		+							
66	Vyambani cliffs	+			+		+							
67	Kaya Kivara	+		+	+	+	+				+			
68	Dzitsoni Caves	+			+		+				+			
69	Cha Simba Sacred Grove	+			+		+			+	+			
70	Taru & Kilisa Hills	+			+	++	+		+					
71	Kaya Fungo / Giriama	+		+	+		+				+			
72	Kaya Chonyi/Achonyi FR (incl. 74, 76)	+			+		+				+			
73	Mwarakaya Sacred Grove	+		+	+		+				+			
[74]	Kaya Vuga (in 72)	SEE: 72												
75	Vipingo Caves Sacred Grove				+		+				+		+	
[76]	Kaya Koyeni (in 72)	SEE: 72												
77	Kaya Jibana FR	+		+	+		+				+			
78	Kaya Tsolokero	NO DATA												
79	Kaya Kambe / Mbwaka Kaya & FR	+		+	+		+			++	+			
80	Pangani Rocks Sacred Grove	+		+	+		+			+	+			(quarry = marble)
81	Mariakani west forests (Kumbulu & Gobwe)	NO DATA												
82	Kaya Ribe (incl. K. Ribe FR)	+		+	+		+				+			
83	Kombeni River Gorge	+			+		+						+	Water Main
[84]	Kaya Fimboni (in 240)	+		+	+		+				+			
[85]	Kaya Bomu (in 240)	+		+	+		+				+			
86	Mtwapa Creek north bank	NO DATA												
87	Mtwapa NM													(PROTECTED)
88	Jumba la Mtwana NM													(PROTECTED)
[89]	Kaya Mwidzimwiru (in 240)	+			+		+				+			
90	Kaya Kauma	++			+		+			++	+			
91	Nguu Tatu hill	+												
92	Kaya Gandini / Takawa / Duruma	+			+		+				+			
93	Kaya Mtswakara	+			+		+				+			
94	Kaya Chonyi (Jivani)	+			+		+				+			
95	Maluganji FR (incl. 96)			+	+		+	+						Elephants
[96]	Kaya Mtai / Mtae NM (in 95)	SEE: 95												
97	Kaya Ngyorani	NO DATA												
98	Kaya Shonda	++			+		+			+			+++	(quarry = stone blocks)
99	Kaya Chitanze / Kitsantse forest	+			+		+				+		+	(development = housing)
100	Kaya Lunguma	+			+		+				+			
101	Kaya Bombo NM	+		+	+		+				+			
102	Kaya Kiteje NM	NO DATA												
103	Kaya Teleza / Dugumura Hill SG	+			+		+				+			
104	Similani Caves Sacred Grove	+			+		+				+			
105	Kaya Miyani	++		+	+		+				+			
[106]	Kaya Kwale / Digo NM (in 108)	SEE: 108												
107	Kaya Waa NM	+		+	+		+			+	+		++	(quarry= blocks; devp. = housing)
108	Shimba Hills NR (incl. 106, 111, 113)			+	+		+	+						
109	Simkumbe forest patch	NO DATA												
110	Kaya Tiwi NM	+		+	+		+				+		+	(housing)
[111]	Mkongani North FR (adj. 108)			+	+		+	+						
112	Kaya Diani NM												++	Rubbish and sewage
[113]	Mkongani West FR (adj. 108)			+	+		+	+	+					Grazing
114	Kaya Ukunda NM	+		+	+		+				+		+	(development = housing / hotel)
115	Kaya Muhaka / Kambe / Mwadabara NM				++		+	++	+					
116	Diani / Jadini Forest	+		+	+		+		+				++	(development = housing / hotel)
117	Mwereni Brachystegia woodland	NO DATA												
[118]	Kaya Dzombo NM (in 121)	SEE: 121									+			
119	Gongoni FR		+	+	++		++	++						

THREATS

120	Kaya Ngalaani/Kinondo NM			+	+		+		+		+		+	Rubbish / Housing / Hotels
121	Jombo FR (incl. 118)	++		+	++		+		++					
122	Buda Mafisini FR			+	+		+	++						
123	Kaya Chale / Chale Island SG NM				+		+				+		++	(development = hotel)
[124]	Kaya Mrima / Mrima Hill SG NM (in 125)	SEE: 125									+			
125	Mrima FR (incl. 124)			+	++		+	++		++				
126	Kaya Msambweni	NO DATA												
127	Marenji FR			+	++	+	+	++	+					
128	Kaya Sega NM				+		+				+			
129	Gonja FR (incl. 131)			+	+		+	++	+					
130	Chuna gallery forest	++		+	+		+		+					
[131]	Kaya Gonja/Mwalewa NM (in 129)	SEE: 129									+			
132	Miongoni gallery forest	+++		+	+		+		+		++			
133	Shimoni forest	+		+	++		+		+		+		++	(devp. = house plots / ? hotel)
134	Kaya Jego NM	+			+		+				+			
135	Shimoni Cave Sacred Grove NM	+			+		+				+		++	Excessive tourism threatens bats
136	Kaya Bogowa NM	+			+		+				+		+	Football field
236	Kaya Chilulu	NO DATA												
237	Kaya Kinangoni	NO DATA												
238	Kaya Madunguni	NO DATA												
239	Kaya Maiowe	NO DATA												
240	Kaya Rabai (incl. 15, 84, 85, 89, 5 others)	SEE: 15, 84, 85, 89												
241	Kirima Cha Mpepe Sacred Grove	NO DATA												
261	Kaya Mvumoni				+		+				+		++	
262	Mwamungu forest patch	NO DATA												
263	Kaya Pungu / Mvuakani	++												
264	Kaya Mlele	NO DATA												
265	Lunga Lunga gallery forest	NO DATA												

Legend: +++ = more than 50% affected; ++ = 10 - 50 % affected; + = less than 10 % affected; (...) damage from past activity only; !/!!/!!! = likely future impact; [BLANK] = none OR not relevant.

THREATS: TANZANIA

No.	Name	Agriculture	Plantation Forestry	Pit-Sawing	Pole Cutting	Charcoal	Fuelwood Collection	Mechanical Logging	Fire	Mining / Quarrying	Loss of Trad. Beliefs	Hunting	Built Development	Other
137	Bagala	NO DATA												
138	Kichi Hills	NO DATA												
[139]	Rondo extension (adj. 206)	NO DATA												
140	Horohoro	!!					(+++)	(+++)	+		++			
141	Kilulu Hill ("Moa")	++				!	+	(+)	+					
142	Ras Kiuyu	NO DATA												
143	Mafi Hill	NO DATA												
144	Mtapwa	+++		+++	++		+++							
145	Msitu Mkuu	NO DATA												
146	Ngezi	+	(+)					(++)						
147	Kwamgumi	+		+++	+		+					+		
148	Kambai Public Lands	+++		+++	++		++					++		
149	Segoma	+		+++	+		+					++		
150	Kambai FR	+++		++	+		++					+++		
152	Marimba	+		+++	+++		++					+		
153	Mkulumuzi Gorge and Amboni Caves	++		+						++				
154	Yambe Island	++								!				
155	Kojani Island	!!												
156	Tongwe								+				+++	
157	Mgelema	NO DATA												
158	Jambangombe	!!!											!	
159	Pangani Falls									+++				
160	Kwani	+++						(++)	+					
161	Handeni Hill							++	+					
162	Mgambo	+						++						
163	Msubugwe				+++			(+++)						
164	Gendagenda (South and North)	++		+	+	+	+		+			+		
165	Mtunguru							++						
166	Mbuzini	+												
167	Kwasumba	NO DATA												
168	Mkwaja						++		++					Grazing +
169	Magotwe	+++												
170	Kiono / Zaraninge	+++		!!	+	!!	+	(++)	+			++	+	Illegal village +++
171	Pagale Hill	NO DATA												
172	Jozani / Unguju	+			++		+	++				+		
173	Muyuni	+++			++									
174	Kilandiw Hill	NO DATA												
175	Msavula Hill	NO DATA												
176	Ruvu North		++		+	+			+++					
177	Dindili	NO DATA												
178	Kitulang'alo	NO DATA												
179	Pande	+		++	+	+++	++						+	Private development ++
180	Ruvu									+++				(gemstones)
181	Pugu	+	(++)	+	+		+			+++				
182	Gongolamboto										++		++	Clearance of vegetation +++
183	Ruvu South				+	++	+		+					
184	Kimboza	+		(+)	+					++				
185	Vikindu	+	(++)		+	+++	+							
186	Kazimzumbwe	+	(++)	(+++)	++	++	+					+		
187	Kisiju / Dendene	+++					+							
188	Mchungu	+		++	+		+							
189	Mrora	+++			++		+			++		++		Clearance to remove pests +++
190	Kilindoni				+							+	++	
191	Kiwengoma ("Matumbi")	++		++	+		+					+		
192	Namakutwa-Nyamuete	+												
193	Ton'gombe	+		!!	+							+		
194	Nangoma										!!!			

THREATS

195	Pindiro / Bwatabwata	NO DATA											
196	Mbinga	NO DATA											
197	Mselezi	NO DATA											
198	Mitundumbea	NO DATA											
199	Ngarama				+			++			+	++	
200	Rungo	NO DATA											
201	Ndimba	NO DATA											
202	Ruawa	NO DATA											
203	Matapwa	NO DATA											
204	Chitoa				+							+	
205	Litipo				+							++	
206	Rondo (incl. 139)		++	+	+		+		++		+	++	Clearance to remove pests ++
207	Ziwani	++			+	+	+						
208	Nyangamara				+		+					+	
209	Chilangala	NO DATA											
210	Mtuli / Hinju	!!			+		+	!!					
211	Mtiniko / Mnivata	++		++	++			++					
212	Mahuta	NO DATA											
213	Namikupula	NO DATA											

Legend: +++ = more than 50% affected; ++ = 10 - 50 % affected; + = less than 10 % affected; (...) damage from past activity only; !/!!/!!! = likely future impact; [BLANK] = none OR not relevant.

THREATS: SOMALIA

No.	Name	Agriculture	Plantation Forestry	Pit-Sawing	Pole Cutting	Charcoal	Fuelwood Collection	Mechanical Logging	Fire	Mining / Quarrying	Loss of Trad. Beliefs	Hunting	Built Development	Other
1	Shoonto	+++		!!	+	++	+	+	+			++		
2	Barako Madow	+++		!!	+	++	+	+	+			++		
3	Boni	NO DATA												

THREATS: MOZAMBIQUE

No.	Name	Agriculture	Plantation Forestry	Pit-Sawing	Pole Cutting	Charcoal	Fuelwood Collection	Mechanical Logging	Fire	Mining / Quarrying	Loss of Trad. Beliefs	Hunting	Built Development	Other
214	Bazaruto	++							++					
215	Dondo	++							++					
216	Dombe	++							++					
217	Nangade	++							++					
218	Negomano	++							++					
219	Mueda	++							++					
220	Nairoto	++							++					
221	Namapa	++							++					
222	Baikopinda	++			++			(++)	+					
223	Mecuburi	(++)			+	+		+	+					
224	Matibane				++	+			+					
225	Muecate	++							++					
226	Inhamitanga	++							++					
227	Chinhongue forest, Benguera Is.	++			++		++						+++	
228	Mabote	++							++					
242	Amatongas	++							++					
243	Serra Mocuta (Mavita)	NO DATA												
244	Inhaca Island Dune Forest	NO DATA												

THREATS: MALAWI

No.	Name	Agriculture	Plantation Forestry	Pit-Sawing	Pole Cutting	Charcoal	Fuelwood Collection	Mechanical Logging	Fire	Mining / Quarrying	Loss of Trad. Beliefs	Hunting	Built Development	Other
229	S. Mulanje forests (incl. 247)	NO DATA												
230	Malawi Hills (part of Matandwe FR)	NO DATA												
[245]	Kalwe (in 258)	NO DATA												
[246]	Nkuwadzi Hill (in 258)	NO DATA												
[247]	Ruo Gorge (in 229)	NO DATA												
258	Nkhata Bay forests (incl. 245, 246, others)	NO DATA												

THREATS: ZIMBABWE

No.	Name	Agriculture	Plantation Forestry	Pit-Sawing	Pole Cutting	Charcoal	Fuelwood Collection	Mechanical Logging	Fire	Mining / Quarrying	Loss of Trad. Beliefs	Hunting	Built Development	Other
231	Makurupini forest	NO DATA												
232	Haroni Botanic Reserve	+++												Refugees +
233	Rusitu Botanic Reserve	+++												Refugees +
248	Chitema River	NO DATA												
249	Rumbise Hill	NO DATA												
259	Pungwe Bridge	NO DATA												
260	Lower Pungwe Valley fragments (excl. 259, 248, 2	NO DATA												

THREATS: SOUTH AFRICA

No.	Name	Agriculture	Plantation Forestry	Pit-Sawing	Pole Cutting	Charcoal	Fuelwood Collection	Mechanical Logging	Fire	Mining / Quarrying	Loss of Trad. Beliefs	Hunting	Built Development	Other
250	Nseleni sand forest	NO DATA												
251	Manguzi lowland forest	NO DATA												
252	Sodwana Bay dune forest	NO DATA												
253	Ochre Hills dune forest	NO DATA												
254	Nyalazi dune forest	NO DATA												
255	Cape Vidal dune forest	NO DATA												
256	Dukuduku dune forest	NO DATA												
257	Mapelane dune forest	NO DATA												

Legend: +++ = more than 50% affected; ++ = 10 - 50 % affected; + = less than 10 % affected; (...) damage from past activity only; !/!!/!!! = likely future impact; [BLANK] = none OR not relevant.