New conservation investment into the Eastern Arc Mountains and Eastern African Coastal Forests biodiversity "Hotspot"

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The term biodiversity 'Hotspot' was first applied in 1988 when an English Professor (Norman Myers) wrote a paper that identified regions in the world where at least 0.5% of all the worlds plants are concentrated, including the Tanzanian Eastern Arc Mountains. The 'Hotspots' idea captured the interest of many conservationists - if they could identify those areas where endemic species were concentrated and then undertake effective work in the same areas - then much of the biodiversity of the world could be saved at realistic expense and within relatively small amounts of the worlds land.

The 'Hotspots' concept was further refined between 1996 and 1998 when the USA-based conservation NGO 'Conservation International' completed a comprehensive global re-analysis of global plant Biodiversity Hotspots. In order to qualify each proposed area had to have at least 1,500 plants wholly endemic to it (approximately 0.5% of the worlds total known species of plants), and at least 75% of the original habitat needed to have been destroyed. Through this process, twenty-five plant hotspots were identified around the world. Together these contain 133,399 endemic plant species (44% of the known world total) and 9,681 endemic animals (35% of the total known). These Hotspots cover an area of 2.1 million km2, or about 1.4 % of the land area of the globe.

Five of the 25 hotspots are found on mainland Africa and one covers Madagascar and nearby islands. In Tanzania there is a single plant Hotspot, which is partly shared with Kenya – the Eastern Arc and eastern African Coastal Forests Hotspot (Figure 1). Over the past year efforts have been made to identify priorities for conservation investment into this Hotspot and $7 million has now been made available for conservation in the area by the Critical Ecosystem Partnership Fund (CEPF), which is a collaboration between Conservation International, the World Bank, the MacArthur Foundation, the Global Environment Facility and the Japanese Government (see cepf.net). During the recent CEPF assessment, updated information was compiled on a number of different measures of biodiversity value in the Hotspot, especially habitat area, and the distribution of endemic and globally threatened species.

Habitats. The hotspot is estimated to have originally supported around 23,000 km^2 of forest, of which around 15,000 km^2 was left in 1900, and a maximum of 5,340 km^2 remained by the mid 1990s. These forested habitats were embedded within much larger areas of high altitude grasslands and low altitude savanna woodlands and bushlands. Forest area has declined primarily due to clearance for agricultural use, but also due to logging, clearance to make charcoal and due to the spread of wildfires. Most remaining forest patches are found in areas protected by the Government, principally as Forest Reserves. There is no accurate data on the current status of the habitats of the Hotspot, but information from all sources indicates a continued and sometimes serious decline, especially of forest and montane grassland habitats.

Endemic species. Current data show that the hotspot is home to at least 1,400 endemic plant species, 16 endemic mammals, 22 endemic birds, 50 endemic reptiles and 33 endemic amphibians (Table 1). The extremely dense packing of endemics in the small area of remaining habitat of this Hotspot makes many of the plants and animals in this hotspot threatened with global extinction. The level of extinction risk is used as a core part of the CEPF process to identify conservation priorities in the Hotspot.

Globally threatened species. All species listed as globally threatened by IUCN that are found in the Eastern Arc Mountains and Coastal Forests of Tanzania and Kenya have been identified and their distributions mapped. The globally threatened fauna (based on IUCN classifications) in the hotspot are represented by 29 mammal species, 28 bird species, 33 amphibian species, and 7 gastropods. The globally threatened flora contains 237 plant species, which is regarded as a great underestimate. In total, 334 globally threatened species are found, with 110 species in Kenya and 310 in Tanzania (see cepf.net). The degree of threat to reptiles, freshwater fish, and almost all groups of invertebrates has not been assessed and hence these species could not be used in this exercise.

Sites. The CEPF process used the number of globally threatened species to identify critical sites for conservation investment. A number of sites in this Hotspot have very high numbers of threatened species. These include: East Usambara Mountains, Uluguru Mountains, Udzungwa Mountains, West Usambara Mountains, Shimba Hills, Lindi District Coastal Forests, Nguru Mountains, Taita Hills, South Pare Mountains, and Kisarawe District Coastal Forests. These are the key areas for conservation efforts seeking to prevent extinction within the hotspot.

Landscapes and corridors. The Eastern Arc mountain blocks are naturally isolated due to their topography and cooler and moister climates. They are surrounded by a 'sea' of hot and dry savanna that prevents the movement of species between different blocks. In the lowland coastal forests, it might appear that forest cover could have been almost continuous in the distant past (and therefore cover a vast area). However the distribution patterns of species in these forests indicate parts of this forest have also been isolated for a long time. These ancient patterns of forest isolation have

Table 1. Species richness and endemism in the Eastern Arc and Coastal Forests Hotspot (From Mittermeier et al. 1999).

Rich = Species Richness (number of species). ***End*** = Endemism (number of species confined to the hotspot).

Hotspot	Vascular Plants		Birds		Mammals		Reptiles		Amphibians	
Eastern Arc and Coastal Forests	Rich	End	Rich	End	Rich	End	Rich	End	Rich	End
	4000	1400	585	22	183	16	188	50	63	33

been dramatically changed over the past few hundred (or perhaps 1000) years as humans have cleared large areas of habitat for farmland and plantations. Many individual Eastern Arc Mountains (e.g. the East Usambaras) now contain a number of disconnected habitat patches that were joined together only a few decades ago. Fragmentation of the forest habitat at this local scale has serious consequences for biodiversity conservation. In particular it is well known that as habitat patch sizes fall, then the number of species within them declines. Below a certain size, then a species will become extinct within a patch. To prevent this occurring, connecting the forest patches through habitat corridors is an essential conservation strategy.

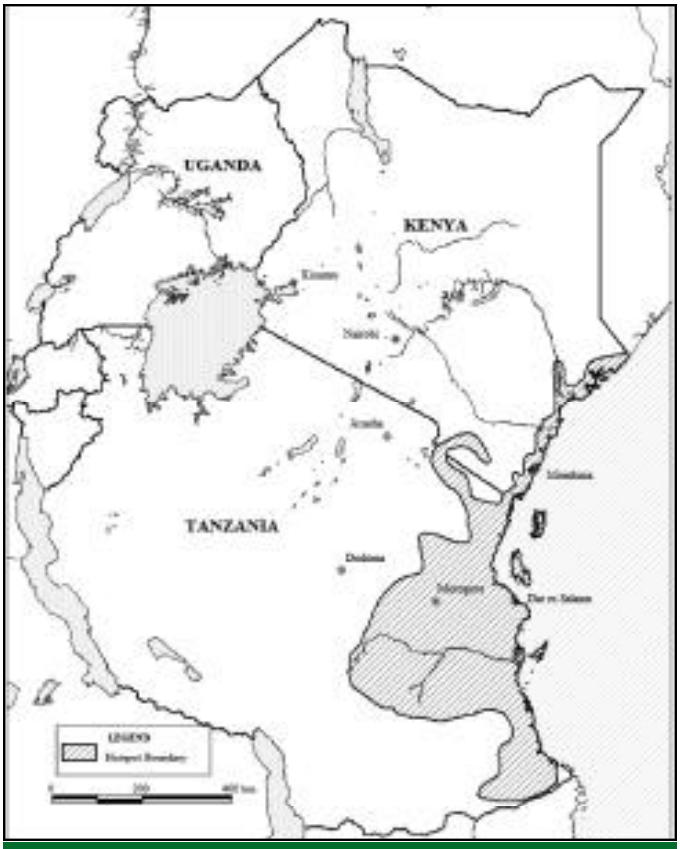
CEPF Role in assisting the conservation of forests in the Eastern Arc and Coastal Forests Hotspot

The investment profile developed for CEPF-funding used data on the distribution of species, habitats, threats, and existing projects to set priorities for conservation investment within this hotspot. The CEPF investment of $7 million over the next 5 years will be available to civil society institutions (NGOs, CBO, private sector, parastatals, Universities) to undertake conservation investments within three broad areas that were agreed by various stakeholders from the region.

1. Increase the ability of local populations in the Hotspot to benefit from, and contribute to, biodiversity conservation
2. Restore and increase connectivity among fragmented forest patches in the Hotspot
3. Improve biological knowledge in the Hotspot

CEPF has requested interested civil society agencies to complete Letters of Inquiry and submit them for consideration. The format for these can be found on cepf.net. The projects that CEPF supports also need to link to other existing projects and hence add value to existing conservation efforts in the region. For the Eastern Arc Mountains of Tanzania, a UNDP/GEF project through the Forest Department of the Ministry of Natural Resources and Tourism will develop a holistic conservation strategy for the Eastern Arc mountain blocks. It is hoped that CEPF investment will assist in the development of this strategy, which will be the main government vehicle for prioritising conservation investment into this region. For the coastal forests, national coastal forest task forces are established in Kenya and Tanzania, involving groups of NGOs and government departments. Again it is hoped that the CEPF investment will help to support these task forces as they seek to mainstream the conservation of coastal forest habitats into government, and NGO work programmes.

It is an exciting time to be involved in the conservation of Eastern Arc and coastal forests in Tanzanian (and Kenya) and it is hoped that the investment of CEPF, when combined with the efforts of government, NGOs and their various conservation donors will be able to stem the tide of forest loss in the region and provide the forests and their biodiversity with a brighter future.



Boundaries of the Eastern Arc and Coastal Forests Hotspot in Tanzania and the positions of relevant protected areas within this region (from cepf.net - Eastern Arc and Coastal Forests Hotspot profile).