The Arc Journal

Tanzania Forest Conservation Group

P.O.Box 23410, Dar es Salaam, Tanzania e-mail: tfcg@tfcg.or.tz Biannual Newsletter Issue No.20 March, 2007
ISSN 0856-8715

CEPF'S US $7 MILLION CONSERVATION PLEDGE

Special Issue on CEPF's Investment in the Eastern Arc and Coastal Forests of Tanzania and Kenya

This special edition of the Arc Journal focuses on the Critical Ecosystem Partnership Fund's (CEPF) US$ 7 million investment in the Eastern Arc and Coastal Forests of Kenya and Tanzania.

Read on and find out more about some of the ways in which civil society organisations are conserving the Eastern Arc and Coastal forests with funding from CEPF.

Since 2004, CEPF's investment has supported 84 civil society-led projects committed to the conservation of the Eastern Arc and Coastal forests of Tanzania and Kenya, the cumulative budget of these projects to date is US$ 6,688,758. These projects involve conservation actions and research in more than 50 sites, home to 93 percent of the hotspots globally threatened species. 18 projects are described in this edition of the Arc Journal and a full list of projects supported by CEPF is given on pages 30 – 31.

The horned bush viper (Atheris ceratophora) is endemic to the Eastern Arc Mountains. Photo by Michele Menegon

CRITICAL ECOSYSTEM PARTNERSHIP FUND

What is the Critical Ecosystem Partnership Fund?

The Critical Ecosystem Partnership Fund (CEPF) is a joint initiative of Conservation International, the Global Environment Facility, the Government of Japan, the John D. and Catherine T. MacArthur Foundation and the World Bank. Conservation International administers the fund.

CEPF provides strategic assistance to nongovernmental organisations, community groups and other civil society partners to help safeguard Earth's biodiversity hotspots, the biologically richest and most threatened areas on Earth. It focuses on hotspots in the developing world and strategically targets priority areas in the hotspots for maximum impact. A fundamental goal is to ensure civil society is engaged in biodiversity conservation.

For more information about CEPF's investment in the Eastern Arc Mountain and Coastal forests, please visit www.cepf.net or cepf.tfcg.org

John Watkin. Photo by Freya St. John

Dear Reader,

It is an honour to have been invited to write a few words for this special edition of the Arc Journal, one of the most far-reaching and relevant environmental media in Tanzania and beyond.

For the last three years, I have been the Grant Director for CEPF's investment in Tanzania and Kenya. This has been an extraordinary opportunity and I have learned a great deal. The over riding lesson has been that there is enormous commitment and capacity amongst civil society organisations working in the region to conserve the unique biodiversity of the Eastern Arc and Coastal forests of Kenya and Tanzania. Through CEPF's investment it has been particularly gratifying to see new partnerships being forged between these organisations.

I would like to take the opportunity of this letter to recognise a few of the many institutions and individuals who have supported CEPF's investment in the region.

CEPF's investment in the region could only have been achieved with the assistance of CEPF's locally based Coordination Unit. Formed by four key institutions and their partners featured elsewhere in this issue, this entity has provided sound advice, technical reviews, and expert guidance. In addition to the organisations that make up the Coordination Unit, I would also like to acknowledge Drs Felician Kilahama, Neil Burgess and Tom Butynski for their considerable input in reviewing project proposals.

The substantial support provided by key national institutions has greatly aided CEPF to achieve a high degree of success. In Tanzania, the Forestry and Beekeeping Division of the Ministry of Natural Resources and Tourism, Tanzania National Parks Authority, Wildlife Division, Tanzania Forest Research Institute, Tanzania Wildlife Research Institute and the Commission for Science and Technology have all extended significant support to CEPF's aims. In Kenya, the Forestry Service, Wildlife Service, National Museum, East African Wild Life Society and NatureKenya have been equally generous. Asanteni sana.

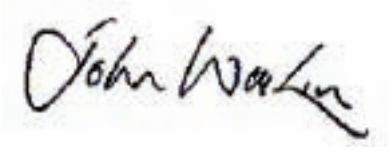
Exciting results from these projects are now starting to be seen. The recent papers in Biological Conservation (Burgess *et al.,* 2006) highlighting the importance of the biodiversity and ecosystem services of the Eastern Arc Mountains is one example. The BBC Film "Villages on the Front Line" is another. The next two years will see an impressive increase in available information about the Eastern Arc and Coastal forests of Kenya and Tanzania.

CEPF's investment also demonstrates and communicates that there are viable alternatives that support livelihoods that do not rely on undermining the integrity of these vital forests. It is only by maintaining and increasing indigenous forest cover that we can all continue to benefit from the services that these forests provide. As the power cuts and water shortages in Dar es Salaam and other towns last year proved, we all rely on these forests.

In writing this I would also like to acknowledge the fact that much of this could not have been achieved without the pioneering steps of Dr Alan Rodgers who, simply put, is a luminary in the field of environmental conservation and who has been an inspiration to so many. His dedication to forest conservation, especially in Tanzania, is an example of what one individual can achieve through his or her actions. All of us have this opportunity for individual action. I hope that this edition of the Arc Journal will inspire you to support the conservation of the forests and biodiversity in this incredible region.

Please enjoy this edition of the Arc Journal.

Yours faithfully



John Watkin
Grant Director, CEPF

Some of the many individuals who have supported CEPF's investment in the region

The CU from left to right: John Salahe (WWF EARPO) , Peter Sumbi (WWF TPO), Nike Doggart (TFCG), Saidi Mbwana (WCST), Ian Gordon (ICIPE), Jasson John (WCST) and Paul Ndang'ang'a (Birdlife International) Photo by TFCG

The CEPF Coordination Unit

Within East Africa, CEPF's investment has been coordinated by four organisations and their partners who together make up the Coordination Unit. These organisations are working together to achieve CEPF's desired outcomes in the region. The four organisations are: BirdLife International - Africa Secretariat (in Kenya the BirdLife Partner is NatureKenya and in Tanzania the BirdLife Partner is the Wildlife Conservation Society of Tanzania (WCST)); the International Centre of Insect Physiology and Ecology (ICIPE), the Tanzania Forest Conservation Group, and WWF - East Africa Regional Programme Office (in partnership with WWF – Tanzania Programme Office).

The job of the CEPF Coordination Unit is to ensure that an effective, efficient and coordinated approach is applied amongst stakeholders to achieve the CEPF conservation outcomes for the Eastern Arc and Coastal forests. To achieve this goal, the unit has been working to meet four objectives. Each organisation is responsible for taking a lead on one of these objectives.

The objectives are as follows:

Objective 1: 'An Eastern Arc and Coastal Forest Coordination Unit exists with appropriate mechanisms to facilitate achievement of the investment priorities identified in the CEPF ecosystem profile'. (Led by ICIPE)

Objective 2: 'Stakeholders within civil society and government are aware of the CEPF process, goals and achievements and are sharing experiences'. (Led by TFCG)

Objective 3: 'Civil society stakeholders are supported to design effective conservation projects in line with the CEPF Ecosystem Profile and submit proposals to CEPF'. (Led by WWF)

Objective 4: 'A comprehensive and complementary suite of CEPF projects is in place to fully address the strategic directions / investment priorities identified in the ecosystem profile'. (Led by BirdLife)

Over the last three years the Coordination Unit has met 16 times to review proposals and to track the progress of CEPF's investment. The Coordination Unit have also held meetings in Kenya and Tanzania to inform potential applicants and relevant government institutes on the investment as well as providing training to community groups on how to apply for funding.

Linkages between CEPF and the Conservation and Management of the Eastern Arc Mountain Forests Project

The Coordination Unit has linked with the Conservation and Management of the Eastern Arc Mountain Forests (CMEAMF) project which is a project of the Forestry and Beekeeping Division of the Ministry of Natural Resources and Tourism financed by GEF through UNDP. CMEAMF aims to develop and implement a conservation plan for the Eastern Arc Mountains ecoregion.

As some of the activities of CMEAMF overlap with those planned through the investment of CEPF in the region, a detailed collaboration was initiated at the start of both projects. This collaboration culminated in an MoU, signed in 2006, that specifies how data is shared, and how the CEPF investment supports the work of the government and how the government supports the work of CEPF in the Eastern Arc region.

Staff of CMEAMF are part of the steering committee and Coordination Unit of CEPF in the region.

BirdLife INTERNATIONAL
Together for birds and people

NatureKenya
The East Africa Natural History Society

WWF

Tanzania Forest Conservation Group

WILDLIFE CONSERVATION SOCIETY OF TANZANIA

icipe

Photo by Michele Menegon

What is a Biodiversity Hotspot?

'The richest and most threatened reservoirs of plant and animal life on earth' – Conservation International.

In 1999 Conservation International identified 25 terrestrial places as biodiversity hotspots urgently in need of conservation investment. These 25 hotspots are tiny islands of habitat that collectively hold 44 percent of the world's plants and 35 percent of terrestrial vertebrates. The cumulative area formerly covered by the 25 hotspots amounted to 11.8 percent of the Earth's surface. At the time of the CEPF assessment, humans had already reduced these biodiversity hotspots to just 1.4 percent of the Earth's land surface! These hotspots are the target of the CEPF investment.

The Eastern Arc Mountains and Coastal forests of Kenya and Tanzania make up one of the 25 biodiversity hotspots. Within this hotspot there are 160 sites which are home to 333 threatened species. In 2003, CEPF brought together more than 48 local, national and international stakeholders to describe the biological values and conservation issues of the hotspot and to identify priority funding needs. The document developed by the stakeholders is known as the Ecosystem Profile and it has guided CEPF's investment in the region. CEPF's investment in the region was launched in 2004.

The overall goals of CEPF's investment are to protect the 160 sites listed in the Ecosystem Portfolio; avoid the extinction of 333 threatened species known to exist in the hotspot; and to achieve landscape connectivity at four key sites.

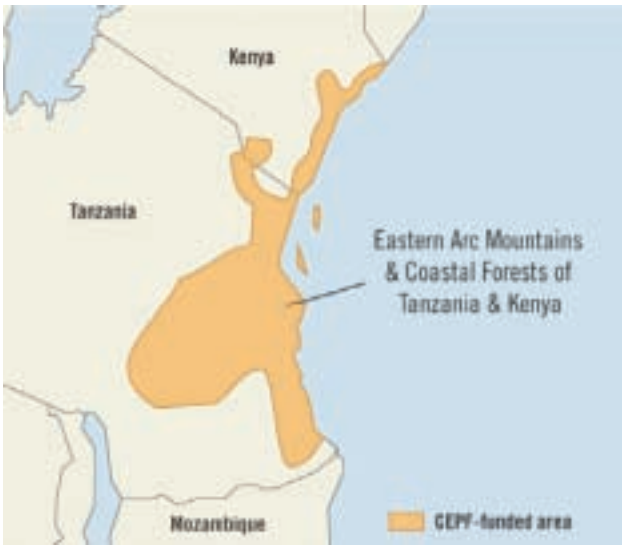
Conservation International in 2004 reassessed the hotspots that they had defined five years previously in an analysis coined as 'Hotspots Revisited'. As a result of this exercise some hotspot boundaries were redrawn and the number of hotspots deemed in need of urgent protection was raised from 25 to 34. Fifty percent of all the plants and 42 percent of the terrestrial vertebrates found within these 34 biodiversity hotspots are endemic species found nowhere else on Earth.

The world's biodiversity hotspots are marked in red from www.cepf.net downloaded March 2007

Hyperplius puncticulatus is near-endemic to the Eastern Arc Mountains
Photo by Michele Menegon

Overview of CEPF's Investment in the Eastern Arc Mountains and Coastal Forests of Kenya and Tanzania

CEPF have committed US$ 7 million to support conservation actions within the Eastern Arc Mountains and Coastal Forests of Kenya and Tanzania. CEPF's investment is guided by an Ecosystem Profile which was developed by stakeholders in 2003. The Ecosystem Profile contains information on biological values and conservation issues and a funding strategy for the Eastern Arc and Coastal Forest region. The funding strategy outlines five Strategic Funding Directions (SFD):



Strategic Funding Direction 1

Increase the ability of local populations to benefit from and contribute to biodiversity conservation, especially in and around lower Tana River Forests; Taita Hills; East Usambaras / Tanga; Udzungwas and Jozani Forest.

Strategic Funding Direction 2

Restore and increase connectivity among fragmented forest patches in the Hotspot, especially in Lower Tana River Forests; Taita Hills; East Usambaras / Tanga and Udzungwas.

Strategic Funding Direction 3

Improve biological knowledge in the hotspot (all 160 sites eligible).

Strategic Funding Direction 4

Establish a small grants program in the hotspot (all 160 sites eligible) that focuses on critically endangered species and small-scale efforts to increase connectivity of biologically important habitat patches.

Strategic Funding Direction 5

Develop and support efforts for further fundraising in the hotspot.

There have been many requests for funding from CEPF. To date 333 Letters of Inquiry have been received and reviewed from which 84 projects have been selected (Fig 1). These 84 projects cover more than 50 geographical sites benefiting 311 out of the 333 threatened species identified in the Ecosystem Profile. 58 % of Letters of Inquiry (LoI) approved for funding are from Tanzanian and Kenyan Institutions.

CEPF have allocated 45% of the funds to initiatives that come under Strategic Funding Direction 1, which provides support to projects that increase the ability of local populations to benefit from and contribute to biodiversity conservation (Fig. 2). 30 % of funds have been allocated to Strategic Funding Direction 3 to improve biological

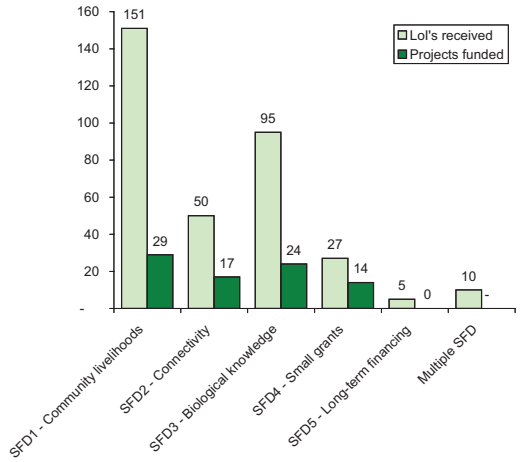


Fig 1. Allocation of CEPF funds by Strategic Funding Direction – March 2007

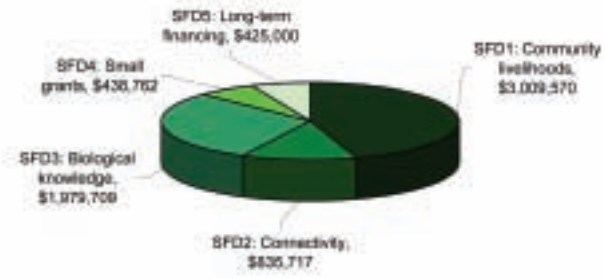


Fig 2. CEPF portfolio by Strategic Funding Direction – March 2007

knowledge of the Eastern Arc and Coastal Forests of Kenya and Tanzania, this significant allocation of funds reflects the need to acquire current knowledge on the biological values of sites within the hotspot. 14 CEPF funded projects have already been completed whilst 70 are ongoing, including two grant allocating projects 'Community Biodiversity Conservation Grants' and 'Conservation Research Grants for Students'.

Project completion documents can be viewed at http://www.cepf.net Full technical reports will be made available at http://cepf.tfcg.org/pubs.html as they become available

Community Biodiversity Conservation Grants

Photo by WWF EARPO

Grantee: WWF East African Regional Programme Officer
Timescale: Jan 2006 – Dec 2008

CEPF has allocated $ 400,000 to Community Biodiversity Grants, a scheme that is being administered by WWF EARPO. Community Biodiversity Conservation Grants are designed to support community-based organisations with funds to undertake activities that will improve their livelihoods and contribute to the conservation of the Eastern Arc or Coastal Forests of Kenya or Tanzania.

So far more than 100 Community Biodiversity Conservation Grant applications have been received by WWF in Kenya and Tanzania. 23 projects have been successful in securing a grant and are conducting activities such as beekeeping, tree planting and enhancing school environmental education.

CEPF have supported the Miritini Environmental Group in Mombasa to Produce honey. Photo by WWF EARPO

Gogoni Conservation Initiative have received support from CEPF to reduce energy needs through improved energy saving cookers. Photo by WWF EARPO

WWF continues to help CBOs access these grants and will continue to allocate funds until the $400,000 are exhausted.

Each application is subject to review by representatives of WWF-EARPO, National Museums of Kenya - Coastal Forests Conservation Unit and NatureKenya in Kenya and by the Tanzania Forest Conservation Group, Wildlife Conservation Society of Tanzania and WWF Tanzania Programme Office in Tanzania. For further information please see http://cepf.tfcg.org/grant.html

Conservation Research Grants for Students

Grantee: Birdlife International
Timescale: Sept 2006 – Dec 2008

Conservation Research Grants for Students, administered by Birdlife International, will provide $ 200,000 to postgraduate students undertaking field work within the Eastern Arc or Coastal Forests of Kenya or Tanzania, building the research capacity of Tanzanian and Kenyan students.

Two PhD and five MSc students from Kenya and Tanzania have so far been awarded Conservation Research Grants. Research projects include:

- Effects of Institutional Arrangements of Joint Forest Management on Forest Condition and Local Livelihoods, PhD study, The Open University of Tanzania;
- Density and Inter-fragment Dispersal of Bird Species in Three Coastal Forest Fragments, Kenya, MSc study, Kenyatta University;
- Assessment of Small Mammal Species Composition and Diversity at Saadani National Park, MSc study, Sokoine University of Agriculture.

All Conservation Research Grant applications are reviewed by the CEPF Coordination Unit. For further information please see http://cepf.tfcg.org/grant.html

Instituting a standardised sustainable biodiversity monitoring system in the Eastern Arc and Coastal Forests

Grantee: BirdLife International
Timescale: Feb 2005 – Dec 2008

Introduction - What is happening?

In February 2005, BirdLife International and its partners in Kenya and Tanzania, NatureKenya and the Wildlife Conservation Society of Tanzania (WCST) respectively, embarked on a four year project, funded by CEPF to establish a standardised biodiversity monitoring system for the Eastern Arc and Coastal Forests (EACF) Region of Kenya and Tanzania. This initiative is being undertaken to stimulate a coordinated approach to biodiversity monitoring within the regional hotspot. This project will also enable the evaluation of conservation activities arising from the five year, US$ 7 million, CEPF investment and progress towards reaching the conservation outcomes as described in the CEPF Ecosystem Profile. One of the long-term goals of the project is to ensure that biodiversity monitoring is embedded as a routine activity into the conservation and research activities of governments, other conservation agencies and community based organizations operating across the EACF Region both within and beyond the auspices of the CEPF / EACF Project.

As a first step, through a stakeholder workshop in May / June 2005, consensus was reached between the key stakeholders in the Region on: (1) the need for a collaborative and coordinated approach to biodiversity monitoring within the Region which is based on the globally applied pressure-state-response model (2) a list of indicators for monitoring at species, sites, habitat / landscape level and the appropriate monitoring tools / frameworks and (3) the need for a spirit of partnership among all stakeholders in data gathering, management, sharing and dissemination.

As agreed at the stakeholder workshop, steps were made to enhance the coordinated storage, handling and sharing of conservation data across the EACF Region through developing and sustaining links with ongoing initiatives and the main repositories of biodiversity data in the Region.

Why should projects contribute their data and how will it be used?

Data provided to the 'Regional Conservation Outcomes Database' contributes to the monitoring of the conservation status of key taxa, sites and ecosystems that are the target of CEPF's investment in the EACF Region. Data is used to:

1) Influence improvement of site management, conservation action and re-direction of investment as required;
2) Facilitate Red Lists assessments and re-assessments;
3) Let others know what kind of information is available and where so that duplication of effort is minimized and sharing of information is enhanced;
4) Guide researchers on the most appropriate questions / gaps to address as well as providing easy access background information;
5) Update information on literature and contacts relating to species and sites outcomes;
6) Identify Key Biodiversity Areas.

What happens to the data once received?

NatureKenya and WCST working with BirdLife International Africa Secretariat and Conservation International in collaboration with other stakeholders manage and maintain the Regional Conservation Outcomes Database, and make information widely available to key institutions within the Region. They also collate, compile, refine and add to the database information on species and sites outcomes, including GIS data, and update information on literature and contacts relating to species and sites outcomes.

How will the data be accessed?

The data are systematically and regularly distributed to the major data repositories in the Region.

In January 2007 the inaugural e-bulletin of the Eastern Arc Mountains and Coastal Forests of Kenya and Tanzania was circulated by Birdlife Africa Partnership Secretariat. The bulletin includes information on species records held on the database, and a number of short articles, the bulletin also informs readers of the increase in the number of Globally Threatened Species found within the hotspot from 333 to 343.

To suscribe to the e-bulletin please contact George Eshiamwata at george.eshiamwata@birdlife.or.ke

How do you add your data to the database?

Data should be submitted to NatureKenya and WCST. These are the institutions in which the Regional Conservation Outcomes Database is held.

NatureKenya: Alex Ngari: office@naturekenya.org

WCST: Jasson John: wcst@africaonline.co.tz

Data can also be submitted to BirdLife International Africa Secretariat through:

Paul K. Ndang'ang'a at paul.ndanganga@birdlife.or.ke or George Eshiamwata at george.eshiamwata@birdlife.or.ke

Through dissemination to relevant authorities the information captured by this initiative will make a wider impact towards biodiversity conservation in the EACF Region so please contribute your data.

How will the source of the data be credited?

The sources of all data received will be credited within the database through full referencing and quoting of the sources of data. All reports produced and circulated from this work will include full references and acknowledgement of the sources of data.

Photo by ICIPE

A farmer in the East Usambara Mountains who has been trained by ICIPE to cultivate *Ocimum kilimandscharicum*

Promotion of nature forest-adjacent Taita Hills

Grantee: International Centre of Insect Physiology and Ecology
Timescale: Apr 2005 – Mar 2008

With support from CEPF, staff from the International Centre of Insect Physiology and Ecology (ICIPE) are training communities living near forests in the East Usambaras, Taita Hills and Lower Tana River region to farm, process and market butterflies, beetles, organic honey, medicinal plants and raw silk. The project aims to increase the income of participating households by 20%. The project also aims to increase the proportion of the community supporting conservation of the forests.

ICIPE are equipping and training community groups in nature-based sustainable businesses ensuring that training is comprehensive, covering each step from initiating an activity to marketing the end product. Project activities include the provision of 200 beehives, 80 of which will be colonized with stingless bees; construction of two community bee product and wild silk processing plants; establishing mulberry plantations for silk moths and; the identification of medicinal / aromatic plants suitable for community cultivation, processing and marketing.

Butterflies, bees and silk

So far more than 170 community group members living in the three project areas, have been trained and equipped for silk moth rearing and beekeeping. More than 60 beehives have been established and in excess of 30,000 mulberry cuttings, the host plant for wild silk moths, have been planted. Groups will soon begin harvesting organic honey and silk cocoons and processing the raw products.

Two community groups in Taita Hills are farming 14 species of butterfly including the two Taita Hills endemics *Cymothoe teita* and *Papilio desmondi teita.* The groups are also planting Toddalia, Teclea, Clausena and Asystasia, the food plants of the most lucrative butterflies (Papilios and Salamis) on their farms. Within six months of starting butterfly farming the groups had produced 1,052 pupae. The sale of 61 percent of these pupae earned the groups US$ 600.

People of Tana River receive training from ICIPE. Photo by ICIPE

based sustainable businesses for communities in the East Usambara, and Lower Tana River Forests

Plant based businesses

Plant based businesses are underway at each of the three main sites with community groups cultivating *Ocimum kilimandscharicum* which is used for treating colds, flu, coughs, abdominal pains, and as an anti-malarial, and neem *(Azadirachta indica)* used in a variety of medicinal, cosmetic, pesticidal, and agricultural products.

With support from this project the neem community enterprise at Lower Tana River now has the capacity to process neem into cake and oil following the renovation of a suitable building and the installation of the necessary equipment. In Taita Hills ICIPE are assessing the market for turpentine extracted from pine resin which has been found to be of good quality, containing 78% alpha pinene.

Future activities

Over the next two years the project anticipates that the silk and honey enterprises will be financially sustainable and that the bee products will receive organic certification. An environmental impact assessment of the turpentine enterprise will be conducted and pending approval this business will be established. Training in post-harvest handling and processing of neem will continue and a business plan for the enterprise developed.

It is anticipated that the two butterfly farming projects will be able to market between one to three hundred pupae per month subject to seasonality. The groups will monitor feed-plant survivorship and conduct regular reviews of their operations, reporting back lessons learned to the project. Participatory monitoring of the wild populations of the two Taita Hills endemic butterflies will be undertaken to determine their conservation status and the impact of butterfly farming. The development of an insect trade continues to be investigated.

An end-of-project socio economic and attitudinal survey of target communities will help measure project achievements. ICIPE will publish a book of guidelines on best practices for nature-based sustainable businesses. The book will be available in Swahili.

Butterfly rearing house, Taita Hills. Photo by ICIPE

A member of the community from the neem-based Salama Hewevu Bio-enterprise in Tana River filtering extracted neem oil Photo by ICIPE

Aerial Mapping of Forest Reserves of the Eastern Arc Mountains and Coastal Forests of Tanzania and Kenya

Grantee: Wildlife Conservation Society
Time scale: Jun 2005 – Dec 2006

The extent of forest cover in the Eastern Arc Mountains and Coastal Forests of Kenya and Tanzania is a subject of some speculation. Although statistics have been compiled, these are from conflicting data sets and cannot be used to monitor trends in forest cover. Without a reliable means for periodically measuring forest cover and quality, large-scale outcomes of project interventions are difficult to quantify.

In the past, satellite remote sensing has been proposed as a solution to mapping and monitoring forest cover. However, preliminary results of satellite image analysis for the Eastern Arc and Coastal Forests are somewhat disappointing in terms of accuracy and resolution. Furthermore, correct interpretation and classification is labor intensive and, often, not possible due to cloud cover over the areas of interest.

David Moyer of the WCS Conservation Flight Programme has received support from CEPF to fly surveys and acquire up-to-date aerial photographs of forests throughout the Eastern Arc and Coastal Forests of Tanzania and Kenya. These high resolution photos are being taken with a professional digital SLR camera system and processed into high resolution, orthorectified, geo-referenced mosaics using purpose-designed image processing software that can produce very high resolution images and accurate Digital Terrain Models. The high image resolution allows visual identification and quantification of human and natural forest disturbance, such as tree cutting, charcoal burning, pit sawing, cultivation and landslides. Manual digitisation of vegetation types will allow highly accurate determination of forest cover, providing a much-needed baseline for monitoring of forest cover changes.

Project progress

Aerial images acquired by this project are providing vital information to other CEPF funded projects such as the Udzungwa corridor projects. Flights to capture images of the Udzungwa corridor areas were obtained from March to October 2006 and mosaics were completed in November.

Other areas for which images have been completed include forests in the Udzungwa, Rubeho, Nguu and Mahenge mountains. Presently, aerial imagery continues to be acquired throughout the Eastern Arc and Coastal Forests of Tanzania and Kenya, and finished mosaics will be distributed as they are completed.

This is a low resolution mosaic of aerial photos taken in 2006 by WCS of Mangalisa Forest Reserve in the Rubeho Mountains. The image shows clearly areas of forest that have been cleared within the reserve.

Andrew Marshall and Tom Struhsaker receive a briefing from David Moyer (centre) before embarking on a survey flight. Photo by F. Rovero

A second population assessment of the Uluguru bush shrike *(Malaconotus alius)*

Grantee: Wildlife Conservation Society of Tanzania
Timescale: Nov 2006 – Apr 2007

The Uluguru Mountains provide the dramatic backdrop to the town of Morogoro. There are two bird species that are strictly endemic to the Ulugurus: the Uluguru bush shrike, *Malaconotus alius,* and Loveridge's sunbird, *Nectarinia loveridgei.* Both of these species are threatened with extinction.

In the late 1990s the Wildlife Conservation Society of Tanzania (WCST) supported surveys to assess the status and distribution of the Uluguru bush shrike. They found that the species was only found within the 84 km^2 of Uluguru North Forest Reserve and an adjacent unprotected forest area that was being cleared for subsistence agriculture.

Jasson John and Deogratias Tillya of WCST playing bird vocalisations to attract the Uluguru bush shrike. Photo by WCST

Following a census in 1999 – 2000 the population size of the Uluguru bush shrike was estimated to be no more than 1,200 pairs. Its limited population size combined with its extremely restricted distribution led to the species being upgraded on the IUCN Red List of Threatened Species from Endangered to Critically Endangered in 2006, i.e. the species is considered to be facing an extremely high risk of extinction in the wild.

Funding from CEPF has enabled WCST to conduct a second population assessment for this bird. The project team has returned to sites within the Uluguru North Forest Reserve that were surveyed in 1999 / 2000 and have extended survey efforts into Uluguru South Forest Reserve, close to the 'Bunduki Gap', a 1.5 km stretch of agricultural land between Uluguru North and Uluguru South Forest Reserves.

Although field data is yet to be fully scrutinised, preliminary analysis indicates that the population in the Uluguru North Forest Reserve is stable or increasing. About 23% of all the census points (N = 209) were occupied by breeding pairs of Uluguru bush shrike. In a few areas up to four breeding pairs were recorded within a 1 km^2 area. The 1999 / 2000 survey encountered 18 – 28 pairs whereas the current survey encountered 46 pairs, however, this increase may in part be due to the increased survey effort.

The bird appears to be absent from the western side of the Uluguru North Forest Reserve where the forest is drier than on the eastern side. However, the team did record the presence of the Uluguru bush shrike in the Uluguru South Forest Reserve, close to Bunduki Gap. One pair was attracted by a vocalization playback at an altitude of 1,739 m whilst a second pair was recorded at an altitude of 1,885 m. This is the first record of the Uluguru bush shrike in Uluguru South Forest Reserve.

There were signs of habitat destruction and degradation within the forest inhabited by the Uluguru bush shrike. Tree felling to make handles for hoes, axes etc. is a significant current threat to the continued existence of the Uluguru bush shrike.

It is recommended that the two forest blocks, Uluguru North and Uluguru South be reconnected so that birds can move between what are currently two distinct forest patches and that further surveys for the bird are conducted in Uluguru South Forest Reserve.

The Uluguru bush shrike *(Malaconotus alius)*

An adult Uluguru bush shrike measures around 22cm in height, it is green and yellow in colour with a yellow underside and washed green flanks it has a distinctive black cap or head. It is confined to the forest canopy of parts of the Uluguru Mountain forests at altitudes between 1,200 – 2,000 m a.s.l.

A sketch of the Uluguru bush shrike. Sketch by Jerome Kimaro

Cymothoe teita, Taita Hills. Photo by ABRI

Butterfly fauna of the Eastern Arc Mountains and Coastal Forests of Kenya and Tanzania

Grantee: African Butterfly Research Institute
Timescale: Feb 2005 – Jan 2006

The African Butterfly Research Institute (ABRI) holds a collection of more than one million specimens of sub-Saharan butterflies. The institute was established in 1997 and is recognized as a world reference collection of African butterflies. The collection has been used to prepare several monographs on Afrotropical butterflies, including the Butterflies of Tanzania (Supplement) (Congdon and Collins 1998), the revised edition of the Butterflies of Kenya (Larsen 1996), and the Butterflies of West Africa (Larsen 2005). The collection is the assemblage of over thirty people's lifetime work on African butterflies, and represents hundreds of thousands of hours of work.

With support from CEPF, ABRI have collated data from existing collections on all butterfly species, especially endemic butterfly species found in the Eastern Arc and Coastal Forests. In addition ABRI have identified gaps in existing knowledge of the distribution and habitat preferences of endemic butterflies and have undertaken field surveys to provide a more complete record.

The specific objectives of this project were to provide an overview of zonal butterfly biodiversity and baseline butterfly distributions that in turn allow the development of conservation priorities and the compilation of annotated checklists of endemic / near endemic butterflies. The project also provided one-year of training to a Tanzanian scientist in butterfly identification and survey techniques.

The Project Leader, Steve Collins, working together with Principal Researchers, Colin Congdon and Ivan Bampton and Co-researches Peter Walwanda and Martin Hassan collected specimens in 12 sites within the Eastern Arc and Coastal Forests of Kenya and Tanzania. In addition the team incorporated data from the ABRI collection of one million specimens as well as considering records from the scientific literature.

As a result of ABRI's work, two butterfly species new to science have been found in the Eastern Arc and Coastal forests. We also have a much clearer picture of butterfly diversity and endemism in the Eastern Arc and coastal forests (Table 1).

Locality	Eastern Arc	Coast	No. of butterfly species	No. of threatened butterfly species	Site Endemics
Kenya					
Arabuko-Sokoke		✓	292	32	-
Taita Hills	✓		248	6	1
Tanzania					
Udzungwa	✓		540	75	9
Nguru	✓		383	54	7
Uluguru	✓		349	40	6
East Usambara	✓		307	43	4
West Usambara	✓		306	43	8
Rondo Plateau / Lindi		✓	278	22	5
Pare Mountains	✓		257	15	1
Pugu Hills		✓	257	20	-
Kimboza		✓	224	27	1
Jozani – Zanzibar		✓	100	13	1
Hotspot wide			709	157	103

Table 1. Number of species of butterflies found in the Eastern Arc and Coastal Forests of Tanzania and Kenya, including endemic and threatened status.

Uranthauma usambarae female, West Usambaras. Photo by ABRI

ABRI have been studying the life histories of a number of butterflies including Pseudargynnis hegemone. Photos by ABRI

Teriomima watkini: one of the new species of butterfly discovered by this CEPF funded project. Photo by ABRI

Crenidomimas. Photo by ABRI

The research found that 155 buttefly species in the Eastern Arc and Coastal Forests are at risk of extinction and that two species are likely to be extinct. Extinct species include: Ornipholidotos nguru from the Nguru Mountains and Spindasis collinsi from the West Usambara Mountains. Habitat loss is the major threat to most butterfly species in the region.

ABRI publishes either directly or in association one book per annum on African Butterflies. For further information on any aspect of the work of ABRI please contact PO ABRI, PO Box 14308, 0800 Nairobi, Kenya, or email Steve Collins at scollins@iconnect.co.ke

Filling the Knowledge Gap: surveys of lesser known sites and species in the Eastern Arc and Coastal Forests

Grantee: Tanzania Forest Conservation Group and Museo Tridentino di Scienze Naturali
Timescale: Apr 2005 - Dec 2007

For this CEPF funded project the Tanzania Forest Conservation Group is working in partnership with the Museo Tridentino di Scienze Naturali. The project aims to increase existing knowledge of the vertebrate biodiversity (excluding fish) and levels of disturbance in three isolated montane sites in the Eastern Arc (Rubeho Mts. (within Dodoma Region), Udzungwa Mountains and North Pare Mountains). Over a wider geographical area, the project will also improve data on the primates (nocturnal and diurnal), duikers, sengis (elephant-shrews), hyraxes, amphibians and reptiles within some of the Eastern Arc and Coastal forests of Tanzania.

The sites and taxa targeted by this study have been selected on the basis of gaps in current knowledge of the biodiversity within the hotspot; consultation with other researchers; and the strengths of TFCG and MTSN's research scientists. Methods have been aligned with other survey projects supported by CEPF such as those being conducted by Frontier Tanzania. The methods used by the project have been described in a manual that is available at http://cepf.tfcg.org.

By March 2007, surveys had been completed in four forests in the North Pare Mountains, five forests in Mufindi District and two forests in the Rubeho Mountains. Surveys for duiker, sengis and galagos have also been carried out in several coastal forests in Tanga Region including Msumbugwe, Genda Genda and Kilulu Forests Reserves. So far, the surveys have clarified the distribution of a number of threatened species including Ader's duiker and the golden-rumped elephant shrew (not recorded in the Tanga forests); the Usambara Mountain galago (not recorded in North Pare or Mufindi forests) and the Cocos dwarf galago (present in Tanga coastal forests).

In the North Pare Mountains, the team have recorded two new species, a frog from the genus *Callulina* and a chameleon from the genus *Rhampholeon*. These species are now being described. In addition the survey team visited West Kilombero Scarp Forest Reserve to follow up on earlier camera trapping photographs that suggested a new species of giant sengi. The results of this work are now being analysed.

A view from North Pare. Photo by Michele Menegon

An African Dormouse. Photo by Michele Menegon

At each of the sites the survey team have been recording indigenous knowledge about primates, duikers and sengis through discussions with local people. These have focused on uses, local names and traditions and observations on their status. The project has also provided training to district staff and local villagers on survey techniques.

Results of the surveys will be published in technical reports that will be posted on the Eastern Arc and Coastal forest websites www.easternarc.or.tz and http://coastalforests.tfcg.org. Key findings will also be included in papers submitted to journals including the Journal of East African Natural History.

Photo by TFCG

The "Filling the Knowledge Gap" research team at Ilole Forest.

The research team collected indigenous knowledge from villages in Tanga. Photo by Andrew Perkin

A Chameleon captured on camera. Photo by Michele Menegon

Primates on Mt. Kasigau, Kaya Rabai, and along the Tana River, Kenya: Preparing for Red List Assessments and Conservation Action

Grantee: Conservation International
Timescale: Jan 2004 – Jun 2004

With funding from CEPF, primate researchers, Tom Butynski and Yvonne de Jong, conducted a brief survey on Mount Kasigau for the elusive Taita Mountain Galago. This tiny nocturnal primate was first discovered in 1999. It is likely to be a subspecies of the Eastern Arc endemic Mountain Galago from which it differs in a number of ways, most notably its advertisement call. Given the proximity of Mount Kasigau to the Taita Hills, there was a possibility that the animal might also be found in Kasigau's forests. Whilst the two researchers believe they visited the correct habitat in which one might expect to find the species, they could not confirm its presence. The researchers highlighted the need for additional more extensive surveys to be conducted at a drier time of year.

Another dilemma that the team investigated was whether or not the Tana River Sykes's Monkey is found outside of the Eastern Arc and Coastal Forests. They visited a site approximately 350 km upstream from the known limits of this monkey's distribution. In a patch of riverine forest on the border of Meru National Park, they had good sightings of the Tana River Sykes's monkey. This indicates that the range of this subspecies is more extensive than previously thought and, more importantly, that its numbers in the wild are far higher than previously believed. Good news for conservation!'

Photo by ABRU

Malundwe's Afromontane Forest and River Catchments: Discovery and Capacity Building

Grantee: Anglia Ruskin University
Timescale: Jul 2005 – Dec 2007

Malundwe forest is situated within Mikumi National Park. The Animal Behaviour Research Unit of Anglia Ruskin University has been conducting research in Mikumi since 1974. Whilst Malundwe Forest has benefited from complete protection for 50 years due to its inclusion within the Park, little data exists for this Eastern Arc Mountain. Funding made available by CEPF has allowed a research team from Anglia Ruskin University led by Guy Norton and including other specialists such as Bill Stanley of the Field Museum to improve our knowledge of this forest.

The Malundwe Mountain block, the smallest of the Eastern Arc Mountain blocks falls equidistant between two of the largest Eastern Arc Mountains, the Uluguru and Udzungwa Mountains. The forests of Malundwe, amounting to approximately 6 km^2 are important for their water catchment value supplying water to three river basins the Ruaha, Wami and Ruvu. Within the funding period the research team are assessing the species diversity and heterogeny; examining forest continuity with woodland and riverine systems; assessing patterns of water flow; examining affinities with other forests and habitats; establishing management plans and building the capacity of the Mikumi National Park Authorities.

To date the project has conducted a number of mapping and biological surveys of Malundwe Forest employing a variety of survey techniques including, but not limited to: small mammal trap lines (Stanley et al), bucket pitfall trap lines, invertebrate traps, bird call recognition, point assessment and transects assessing vegetation.

Most plant species recorded so far are species found in other Eastern Arc Mountain forests. The research team is currently awaiting the confirmation of identification for various faunal specimens, amongst which there may be some endemic species.

During the implementation of this project the research team has encountered logistical difficulties concerning reliable access to a supply of drinking water and indeed access to the forest, with areas away from contour related game trails being difficult to access, an issue further exasperated during the wet season. However, the research team is aware of the potential to bias data and as such is making a concerted effort to access areas throughout the forest in both the wet and dry seasons.

Part of the research team, Charles & William Mbega, Hamisi and Kate McQuaid. Photo by ABRU, Ruskin University

Mwile Mbega, Neil Burgess and Guy Norton, taking a well earned rest on Malundwe. Photo by Michelle Klail

The Biodiversity Database – Making data available on the species and sites of the Eastern Arc and Coastal Forest hotspot in Tanzania

Grantee: Department of Zoology and Wildlife Conservation, University of Dar es Salaam
Timescale: May 2005 – Nov 2008

The Biodiversity Database of the Department of Zoology and Wildlife Conservation, University of Dar es Salaam was established in 1994 under the direction of Professor Kim Howell as part of a Global Environment Facility (GEF) project. Since that time more than 16,000 records have been entered into the database, most of which are specimen data from terrestrial vertebrates collected during various research projects, environmental impact assessments and theses. More specifically approximately 12,000 of these records are from vertebrate species collected from the Eastern Arc Mountains.

To keep such a comprehensive database up to date involves a significant undertaking from both taxonomic experts and data entry personnel. Funding from CEPF has contributed to:

1) Physically identifying, sorting and labelling specimens collected in Tanzania;
2) Data entry and management of specimen data and;
3) Entering data from non-specimen sources – 'data mining' of historical records such as field notes and older writings.

The Biodiversity Database holds site specific data that includes information regarding a species endemic / near endemic status and its threatened status based on the IUCN Red List of Threatened Species. Having such a comprehensive dataset readily available at the press of a button is a valuable tool to landscape managers and conservationists. Indeed the development of the CEPF ecosystem profile, the document that has guided CEPF's investment, has proved that effective collection, collation and storage of field data are critical in making decisions about the investment of scarce conservation funds.

Professor Kim Howell at Kihansi Gorge

Restoration and increase of connectivity among fragmented forest patches in the Taita Hills, south-east Kenya

Implementors of forest connectivity in the Taita Hills: The East African Wild Life Society; University of Ghent, Belgium; University of Antwerp; The Forest Department; Chawia Community Environment Committee and Sigha Sigha Support Group

The fragmented forests of the Taita Hills

The overriding conservation problem in the Taita Hills is loss, fragmentation and degradation of the indigenous forest cover. Indigenous cloud forest in the Taita Hills currently covers an area of about 430 ha, reflecting 98% forest reduction over the last 200 years, mainly due to clearance for agricultural purposes. Although forest clearance is less widespread at present, past clearance led to increased isolation of the remaining patches, edge effects and soil erosion. Yet, despite the small size of the 12 remaining indigenous forest fragments (range 1 – 179 ha, 9 fragments < 10 ha), they are of global conservation importance, holding numerous rare and endemic plants and animals (including six vertebrate species endemic to the Taita Hills). Because many of these species persist in small and highly isolated subpopulations, a high proportion is highly threatened and is of immediate conservation concern (demographically, genetically, or both). Currently, 34 Taita animal and plant species are classified under some category of threat according to the IUCN Red List (accessed in May 2005).

CEPF's investment in the Taitas

In a desire to chart a unified way forward CEPF funded a stakeholders' workshop (organised by the East African WildLife Society) in February 2005 to discuss the conservation and management of the Taita Hills forests. Participants included community representatives from various parts of the Taita Hills, NGOs working in the region (both local and international), relevant Government departments and institutions conducting research in the Taita Hills. The workshop's main purpose was to give stakeholders an opportunity to discuss key threats and challenges, as well as identify the best options for restoration and connectivity enhancement among the Taita Hills forests fragments. Two key resolutions from the workshop were to: (i) increase indigenous forest area and reduce degradation of remnant indigenous patches (i.e., safeguard biodiversity habitats and population processes); and (ii) increase forested area in the surrounding matrix and convert plantations of exotic trees to indigenous ones (providing for human needs and increasing overall connectivity of the landscape).

During the stakeholders' workshop, conversion of existing exotic forest plantations into indigenous forests was identified as a key target for habitat restoration. With finance from CEPF, and in partnership with NatureKenya, researchers from the University of Ghent, Belgium have been developing a mechanism for identifying priority sites for habitat restoration as well as developing appropriate methods for habitat restoration. The three stages for this work are mapping, modelling and habitat restoration.

Three steps to restoring forest connectivity

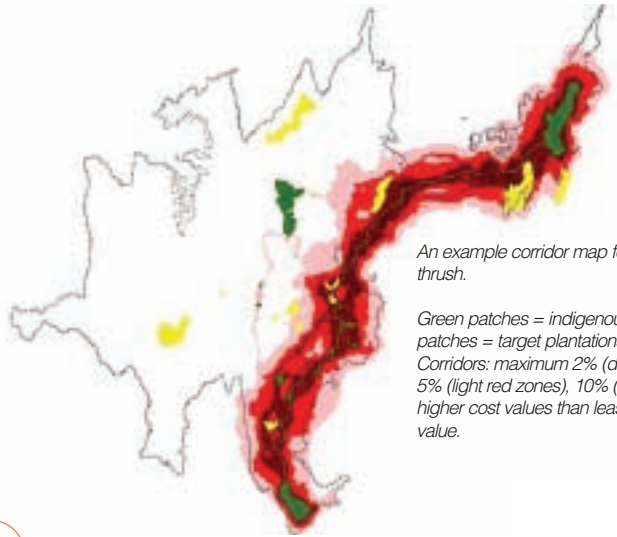
Stage I: (i) Mapping of the location and boundaries of all plantation fragments through a combination of fieldwork and interpretation of high-resolution aerial photographs; (ii) Scoring of each plantation fragment according to its suitability for habitat restoration, based on biotic and abiotic properties such as existing tree species composition, quality of the indigenous seed bank, age and history of the fragment, slope and altitude; and (iii) inquiries into possible legal or socio-economic constraints for conservation action.

Stage II: Least-cost modelling for connectivity
Least-cost modelling is a planner's tool used to predict and evaluate the effects of land management and habitat restoration projects. It involves integrating detailed geographical information as well as behavioural aspects in connectivity analyses. By using three GIS layers – a source layer, a friction / resistance layer and a target cell – it estimates the effective distance, which represents the least cost for moving between any two cells within a landscape map.

Stage III: Habitat restoration
Rehabilitating the forest patches to good quality indigenous forest cover through various means such as silvicultural treatments that would encourage indigenous tree growth, systematic cutting of exotic trees and re-planting with indigenous trees or both depending on the situation.

What has been achieved so far?

The project has mapped the location of plantation boundaries and conducted least-cost modelling using sensitive species such as the Taita thrush, Cabanis's greenbul and yellow-throated woodland warbler that frequent and move through high quality forest and exhibit marked negative edge effects (See Fig 1 for an example).



An example corridor map for the Taita thrush.

Green patches = indigenous forest. Yellow patches = target plantations. Corridors: maximum 2% (dark red zones), 5% (light red zones), 10% (pink zones) higher cost values than least-cost path value.

Habitat restoration

Habitat restoration is underway with (i) Systematic planting of indigenous tree species in and around current indigenous forest reserves to improve habitat quality and increase the size of indigenous forest habitat (ii) Planting of fast-growing and farming-friendly (indigenous or exotic) trees around homesteads to increase wooded habitat within the matrix, besides providing extra sources of firewood for the community and fodder for livestock and (iii) Cutting down of exotic trees in plantations straddling indigenous forest fragments and replacing them with indigenous saplings.

Chawia Forest

With funding from CEPF the East African Wild Life Society are assisting the Chawia Community Environment Committee to rehabilitate Chawia Forest, the second largest remaining forest fragment in the Dawida massif after Ngangao. It is one of the most heavily disturbed forests due to human activities such as tree harvesting, cattle grazing, firewood collection, and other activities. The forest is partly surrounded by agricultural land and is still home to a number of plants and animals that are endemic to the Taita Hills forests.

To date with funding from CEPF and assistance from EAWLS the Chawia Community Environment Committee have raised 68,200 indigenous tree seedlings of *Prunus africana Tabernaemontana stapfiana, Millettia oblata, Syzygium guineense, Ocotea usambarensis, Podocarpus latifolius, Newtonia buchananii* and *Albizia gummifera* for forest enrichment planting. 5,000 exotic and indigenous tree species have been raised for planting on farms, schools, communal wood plots and church land. Fast growing timber species such *Grevillea robusta, Cupressus lusitanica;* fruit trees such as mango (grafted) and avocado (grafted); firewood and fodder species such as *Leucaena leucocephala* and *Gliricidia sepum* have all been raised.

Mwambirwa Forest

Funded by CEPF the East African WildLife Society are assisting the community group Sigha Sigha Support Group to re-establish forest connectivity between Mbololo Forest with a small patch of indigenous forest (Rong'e Forest) within Mwambirwa Forest which is one of the major fragments making up the Taita Hills forests. Mwambirwa Forest which is dominated by exotic plantations especially on the ridges and slopes is separated from the indigenous biodiversity-rich Mbololo Forest by a narrow gap of less than 3 km. A significant portion of the exotic trees of Mwambirwa Forest were burnt down in 1997 and 2001. The burnt area is currently characterized by bare areas where eucalyptus is rapidly colonizing, dead logs and standing dead or dying trees.

Since project activities started the Sigha Sigha Support Group with the assistance of EAWLS have raised 91,800 indigenous seedlings, once these have reached a minimum height of 30cm these seedlings will be planted in Mwambirwa Forest. In preparation for planting EAWLS supported the Forest Department to conduct an assessment of the planting area to ensure that dead and fire damaged trees are removed from the site prior to planting to avoid damage to newly planted seedlings. 10,000 mainly exotic species *(Cupressus lusitanica* and *Pinus sps)* have been raised by the Sigha Sigha Support Group and will be distributed to forest adjacent communities for planting. Pine species are being raised to boost the bio-prospecting component of the ICIPE projects funded by CEPF, (turpentine *(alpha pinene)* is extracted from pine resin) thus linking communities to alternative income generating activities. The group have also been involved in fire-break maintenance together with the forest guards in Mwambirwa Forest, farmers living adjacent to the forest have been urged to maintain firebreaks, however, it is anticipated that this will be more effective once the people living adjacent to the forest have been supplied with and have planted the tree seedlings.

Project implementation with the Sigha Sigha Support Group and the Chawia Community Environment Committee has met with great success. Forest restoration in Mwambirwa and Chawia is still underway and whole communities and forests stand to benefit from the collaborative Taita Hills forest restoration and connectivity project that has brought together local, national and international players.

Participants of the 2005 Taita Hills Workshop

The District Forest Officer Mr. D. Muigai planting a tree on a communal plot in Chawia. Photo by EAWLS

The Forgotten Coastal Forests of Mtwara

Grantee: Society for Environmental Exploration
Timescale: Feb 2005 – Dec 2005

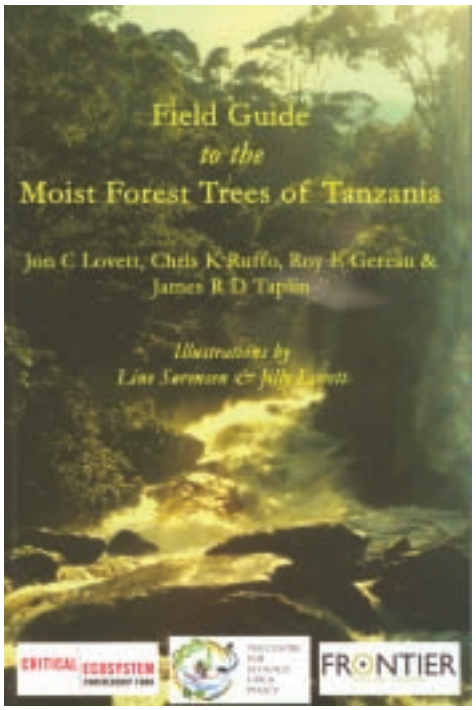
Between April and August 2005 Frontier Tanzania, with support from CEPF, conducted a reconnaissance project to eight Coastal Forests of Mtwara Region. The survey team conducted biodiversity and forest disturbance surveys in each of the Forest Reserves – Kambona, Ndechela, Mtiniko, Mkunya River, Mtuli Hinjuu and Makonde Scarp I, II and III. Interviews were also conducted with members of forest adjacent communities to glean indigenous knowledge regarding the area.

The survey team found that there was a high degree of habitat destruction taking place in the area and only small patches of closed canopy Coastal Forests remain. Given the extensive loss of suitable forest habitat it is not surprising that less than 2% of the faunal species found are strictly endemic to the Coastal Forests and / or Eastern Arc Mountains. These include Reichenow's batis *(Batis reichenowi)*, the Spotted flat-lizard *(Platysaurus maculatus)* and the toad *Mertensophryne micranotis.*

Given the dependence on natural resources of people living in the area, the team concluded that only by complementing major efforts to improve the living standards of the local communities can natural resource management and environmental awareness promotion succeed in preserving the highly threatened Coastal Forests of the Mtwara Region for present and future generations.

Granite kopjes protruding from the plain in Ndechela Forest Reserve, Tanzania. Photo by Frontier Tanzania field staff

Field Guide to the Moist Forest Trees of Tanzania



Grantee: University of York
Timescale: Sept 2004 - Dec 2005

With support from CEPF the Field Guide to the Moist Forest Trees of Tanzania by Jon C. Lovett, Chris K. Ruffo, Roy E. Gereau and James R. D. Taplin is now available for forest enthusiasts to enjoy. Containing illustrations by Line Sorensen and Jilly Lovett this much awaited for field guide started life as a file card index prepared by Jon Lovett during field work in Tanzania from 1979 to 1992. The guide covers closed evergreen and semi-deciduous forests of the Eastern Arc Mountains and coast, the northern and southern mountains, and forests on the shores of Lakes Victoria, Tanganyika and Nyasa. The forests range from lowland groundwater and riverine forests to elfin mist forests on the highest peaks. 658 species of larger trees are described with the help of 321 plant illustrations and 152 species distribution maps.

Field Guide to the Moist Forest Trees of Tanzania is available from The Society for Environmental Exploration, 50 - 52 Rivington Street, London, EC2A 3QP, UK. E-mail: research@frontier.ac.uk. ISBN: 1-873070-33-0.

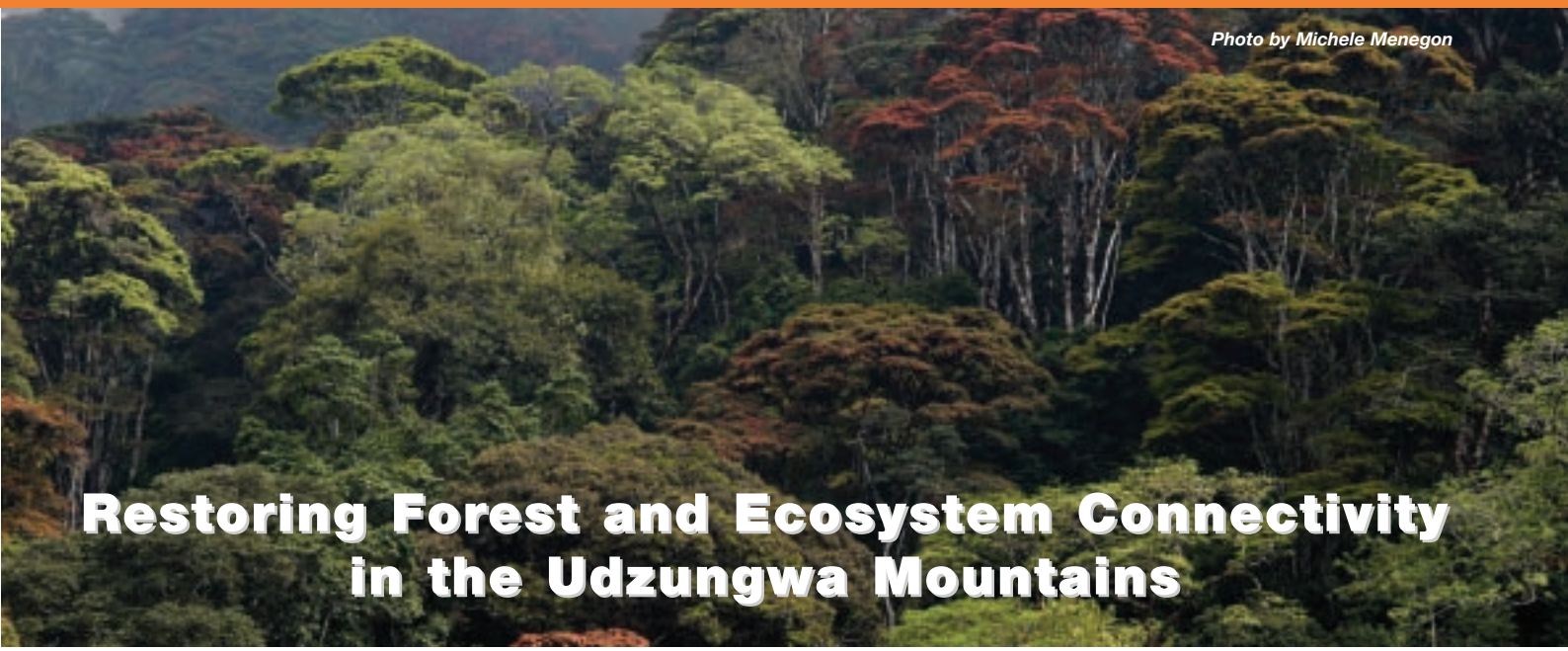


Photo by Michele Menegon

Restoring Forest and Ecosystem Connectivity in the Udzungwa Mountains

Why are the Udzungwas important?

The Udzungwa Mountains are one of the three priority sites for CEPF's investment in restoring forest connectivity. Parts of the Udzungwa Mountain forests lie within the Udzungwa Mountains National Park (UMNP) which gives them a high degree of protection. Other Udzungwa forests lie within forest reserves or on village land. Over the next five pages you can read about some of the projects that CEPF is supporting in the Udzungwa Mountains.

Introduction

Within the wider Udzungwa landscape (Fig 1.), loss of connectivity between forest patches and between the mountain forests and lowland migration grounds is a cause for conservation concern.

Pressure on surrounding land is growing. Over one million people live in the vicinity of the mountains. This population is growing and with it grows the demand for land for agriculture.

CEPF have financed five projects that address fragmentation in the Udzungwa Mountains. Three of these projects are a product of a workshop financed by CEPF and organized by WWF in December 2004 that provided a forum for organisations, communities, researchers and Government departments to identify priority actions for the restoration of forest connectivity in the Udzungwa Mountains.

Socio economic study of the Udzungwa Scarp area: A potential wildlife corridor

Grantee: WWF Tanzania Programme Office
Timescale: Feb 2006 – Jul 2006

Working in the Southern Udzungwa Mountains, WWF have conducted a socio-economic study to assess how communities use and value forests and to identify ways in which communities can participate in and engage with future forest management activities. The project links closely with the ecological research conducted by Museo Tridentino di Scienze Naturali described in the next part of this article.

The study reviewed different management scenarios for the area and related these to the aspirations and socio-economic realities of adjacent communities. The study concluded that a socio-economic perspective must be adopted alongside an ecological perspective in considering future approaches to forest management as the livelihoods of the population in the area generally depend, in part, on forest resources. In addition the study recommended that the views and needs of these communities should be taken into account and that the communities must be integral to any future management regime. The researchers also found that currently, the communities indicate a willingness to act as custodians of the forest and this should be encouraged.

Fig 1. The Udzungwa Mountains Landscape. Map by A. Marshall

Assessing the potential for restoring connectivity and evaluating options for improved management of the Uzungwa Scarp, Iyondo, Matundu and Nyanganje Forest Reserves in the Udzungwa Mountains

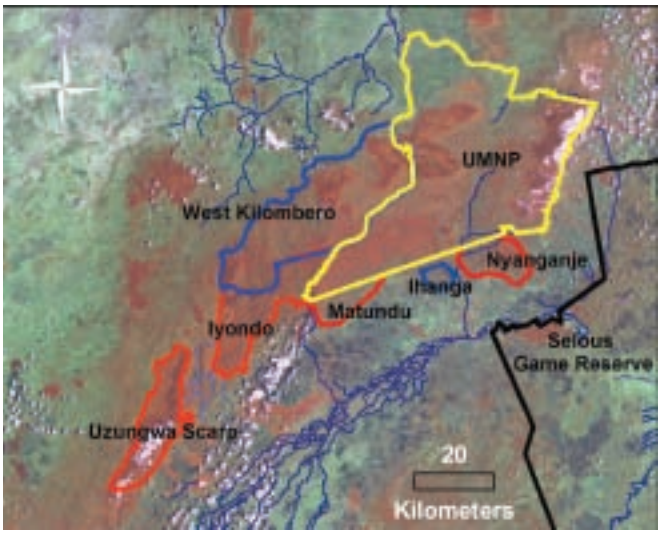
Grantee: Museo Tridentino di Scienze Naturali, Italy
Timescale: Jan 2006 – Mar 2007

The Museo Tridentino di Scienze Naturali, in partnership with WWF, have been assessing the habitat status, ecosystem integrity and human impacts in and near the Udzungwas to facilitate the mapping of wildlife corridors.

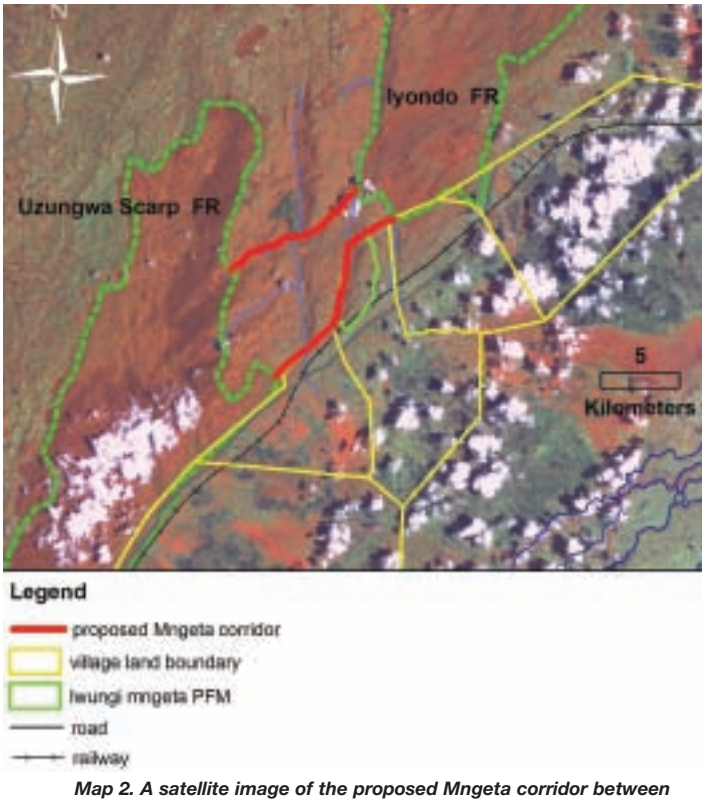
The project has focused on four forests: Udzungwa Scarp, Iyondo, Matundu and Nyanganje Forest Reserves (see Map 1) that were identified as priority areas at the 2004 stakeholders' workshop. This especially applies to Udzungwa scarp: whilst across the entire Eastern Arc the number of restricted range species per 100 km^2 is 4.5, the number reaches 33.8 per 100 km^2 in this forest. The forest is a unique centre of endemism, home to several endemic amphibians and reptiles, as well as the Sanje mangabey (Udzungwa endemic), Udzungwa red colobus (Udzungwa endemic) and Abbott's duiker (Tanzanian endemic).

To date, research conducted by this project can confirm that Udzungwa Scarp, Iyondo and Matundu Forest Reserves are high biodiversity forests, comparable to the National Park. Human encroachment is high and increases with proximity to villages, and reaches highest levels in Iyondo and Uzungwa Scarp. There is a need for boundary demarcation and awareness raising with regards to permitted and non-permitted activities within Forest Reserves. The project has also assessed that a key area for connectivity within the Udzungwas is the "Mngeta corridor", linking Iyondo to Uzungwa Scarp (See Map 2).

Future outputs of this project include a detailed proposal for creating the "Mngeta corridor", and summarised quantitative biodiversity values and threat status for the Forest Reserves under consideration compared to the National Park. Results will help providing recommendations for improving conservation management. A stakeholders' workshop in collaboration with WWF will provide the forum for presentation of project results and to facilitate stakeholders' agreement for implementation. This workshop is scheduled for March 2007.



Map 1. A satellite image of the Udzungwa Mountains with protected area boundaries superimposed. In the satellite image, forests and woodland show up as red while other land uses such as agriculture appear green. The yellow line shows the boundary of the Udzungwa Mountains National Park (UMNP); The blue line show the boundary of forest reserves not included in the study; the red line show the boundary of the forest reserves studied by the project and the black line shows the boundary of the Selous Game Reserve. Map by F. Rovero.



Map 2. A satellite image of the proposed Mngeta corridor between Iyondo Forest Reserve and Udzungwa Scarp Forest Reserve. In the satellite image, forests and woodland show up as red while other land uses such as agriculture appear green. The Forest Reserve boundaries are marked as green lines; the border of the proposed corridor is marked in red and the village boundaries are marked in yellow. Map by F. Rovero.

An aerial photograph of Mngeta corridor. Photo by F. Rovero

Maintaining connectivity between the Udzungwa Mountains and adjacent ecosystems

In collaboration with F. Rovero of Museo Tridentino di Scienze Naturali, and through a grant from Conservation International's Corridor learning Initiative, Trevor Jones of Anglia Ruskin University is assessing the feasibility of protecting corridors that allow the movement of large mammals, particularly elephants, across the greater Udzungwa Landscape.

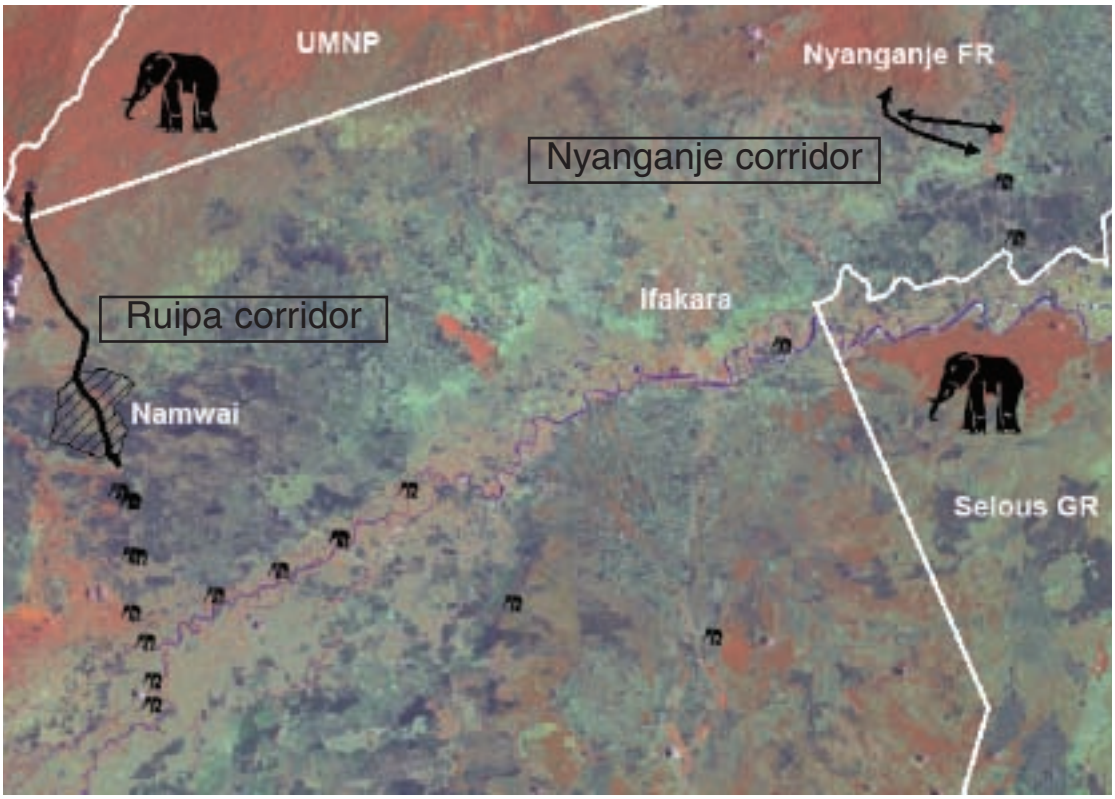
Observations made in 2003 / 04 showed that large mammals move between the Udzungwa Mountains National Park and adjacent ecosystems (Selous Game Reserve and Kilombero Game Controlled Area, Mikumi and Ruaha National Parks). The Udzungwa area has experienced rapid human immigration and land use change over recent years that have obstructed animal migration routes. Compounding this human induced pressure, it is known from other sites that newly protected large mammal populations (e.g. elephant and lion), such as those that have been protected inside Udzungwa Mountains National Park since 1992, can expand rapidly. This larger and more widely dispersed population of large mammals, when enclosed, increases destruction of the highly diverse forest habitat. In addition human-wildlife conflict increases as the mammals try to migrate along historic migration routes that are now inhabited by people.

Wildlife corridors linking the Udzungwas with Selous Game Reserve, Mikumi National Park and Ruaha National Park offer a potential solution that is being investigated by this project. Few suitable places still exist for the establishment of wildlife corridors making the need for results and action urgent. This particular project is focused on connectivity between the Udzungwas and the Selous.

Preliminary Results

Fieldwork has combined a number of methodologies including aerial surveys, disturbance and dung transects and questionnaires. Preliminary results reveal that two corridors still offer a glimmer of hope: the Nyanganje corridor and the Ruipa corridor. However, in both cases the corridors are now extremely narrow (1.5 – 6 km wide), and though they are still utilised by large mammals, the remaining habitat is under threat from cattle grazing, timber harvesting and burning, especially in the Namwai area of the Ruipa corridor. It is feared that unless swift action is taken, both corridors could be gone within two years.

Currently the project is analysing data from the feasibility studies, selecting, designing and mapping potential long-term corridors and exploring ways to halt the habitat destruction of the Ruipa corridor. As with the Uzungwa Scarp project a feasibility report and recommendations will be presented at the stakeholder workshop scheduled for March 2007. From there the consultation and implementation process may begin.



Remaining active elephant corridors between the Udzungwa Mountains National Park and the Selous Game Reserve, 2006. Black lines represent critical sections of corridor in imminent danger of being permanently blocked by human activity. Map by T. Jones.

Landscape photograph of the corridor area.

A male red colobus browsing on a climber. Photo by Trevor Jones

History of Magombera Forest

Magombera Forest Reserve was gazetted in 1955. At this time the forest lay contiguous with the forests of the Udzungwa Mountains and covered an area of 15.1 km^2 and spanned most of the Kilombero Valley. The construction of the Tanzania – Zambian Railway in 1970 bisected the forest and led to the removal of most of the valuable timber species. The completion of the railway was followed by the establishment of two Ujamaa villages along the railway near Magombera Forest, (Msolwa to the East and Katurukila to the West). Subsequently more villages were established as the human population grew.

In 1980, all authorities agreed that the Magombera Forest Reserve should be annexed to the Selous Game Reserve. To enable annexation the Reserve was degazetted as a forest reserve in 1982. Ten years later it came to light that Magombera Forest, was never legally annexed to the Selous Game Reserve meaning that the forest has no protective status. To further exacerbate the situation in 2002 it emerged that Illovo Sugar Company occupied 10 km^2 of land between Magombera forest and the border with the Selous

Improving Conservation of Magombera Forest

Grantee: WWF Tanzania Programme Office
Timescale: Feb 2007 – Apr 2008

Magombera forest is one of the last remaining patches of groundwater forest in the Kilombero valley. It is home to a number of species of conservation concern including the Udzungwa red colobus, an Udzungwa Mountains endemic. There have been several proposals to include the forest in the Selous Game Reserve however annexation has yet to be achieved. With support from CEPF, WWF will ensure the annexation of the forest to within the Selous Game Reserve whilst facilitating the participatory development of land use management plans for adjacent villages. WWF will also work with relevant Government authorities and forest adjacent communities to raise awareness of the importance of the forest.

For more information regarding this project please contact Zakiya Aloyce ZAloyce@wwftz.org

Biological Importance of Magombera Forest

By Andrew Marshall

Magombera forest consists primarily of closed canopy semi-deciduous forest with a unique community composition comprising plant species typical of Afromontane rainforest, Zanzibar-Inhambane lowland forest, and dry coastal forest. A recent study of trees found a total of 22 Eastern Arc and Coastal Forest endemics, classified as threatened on the IUCN Red List. Two of these are the most commonly found trees within Magombera Forest (*Isoberlinia scheffleri* and *Lettowianthus stellatus*). There are also two endemic woody plant species (*Ixora sp.* nov and *Memecylon magnifoliatum*), and another *(Polyalthia verdcourtii)* found only in Magombera Forest and one other location in the Udzungwa Mountains.

Magombera Forest also has several animal species of conservation importance. The Udzungwa red colobus *(Procolobus gordonorum)* is endemic to the Udzungwa Mountains and Kilombero Valley. With over 1,000 individuals, Magombera Forest contains the highest density of this species anywhere. The forest is also important for other mammalian fauna, as a dry season refuge for large game from the Selous Game Reserve. The herpetofauna of Magombera Forest is also interesting and includes a recently discovered chameleon known only from Magombera and Mwanihana forests, and a frog endemic to the Kilombero valley *(Hyperolius reesi)*. Like the plants, there are also some montane bird species found at unusually low elevation. There are also several species of birds of conservation importance.

Restoring forest connectivity in the Udzungwa Mountains

Grantee: Tanzania Forest Conservation Group
Timescale: Aug 2006 – Dec 2008

TFCG started working in the Southern Udzungwa forests of Mufindi District in 1993 with support from the African Rainforest Conservancy. The objective of the project in Mufindi District has been to protect the biodiversity of the forests of the Southern Udzungwas through sustainable forest management, increased awareness and improved livelihoods for forest adjacent communities. Prior to CEPF's investment, TFCG had been working with six villages and had supported the establishment of participatory forest management for Lugoda-Lutali and Lulanda Forest Reserves; raised awareness on forest conservation and improved livelihoods through initiatives such as establishing a savings and credit scheme. The project had also succeeded in reforesting two areas using indigenous species.

Since July 2006, CEPF's support has enabled TFCG to scale up its activities in Mufindi District. In August 2006, TFCG hosted a stakeholder workshop at which the participants agreed that the goal of restoring forest connectivity in Mufindi District is: To involve people in the community in protecting and restoring the natural resources of the forests in order to improve biodiversity and benefits for the community.

Stakeholders selected 12 sites for restoration of connectivity and developed action plans for each site. The following ways of restoring forest connectivity were identified (1) protecting existing forests in areas critical for maintaining forest connectivity; (2) replanting natural forest and (3) creating areas with a tree-dominated land use.

The project team is now prioritising the sites where CEPF's funds will be used for restoration activities and have begun to identify the precise areas for restoration to occur and the appropriate method for each area. The project has already provided tree nursery equipment and training in agroforestry and tree planting in some of the communities.

With additional support from CEPF, TFCG in partnership with the Museo Tridentino di Scienze Naturali have conducted biodiversity and resource use surveys in several of the Mufindi Forests, helping to identify the priority sites. Kigogo and Lulanda appear to be the most important forests biologically. With support from CEPF, TFCG have also conducted research on participatory forest management and have produced a film about participatory forest management in Mufindi which has been broadcast on national television as well as being used as a training tool.

Part of the Lulanda Forest corridor. Photo by TFCG

Hamadiel Mgalla and Castory Mdalingwa in the indigenous tree species nursery in Lulanda. Photo by TFCG

Participants in the Mufindi forest connectivity workshop supported by CEPF in August 2006. Photo by TFCG

Forest Connectivity –

Land use management guidelines for enhancing ecological connectivity in the Eastern Arc Mountains

Grantee: Utah Museum of Natural History, University of Utah
Timescale: Aug 2005 – Dec 2008

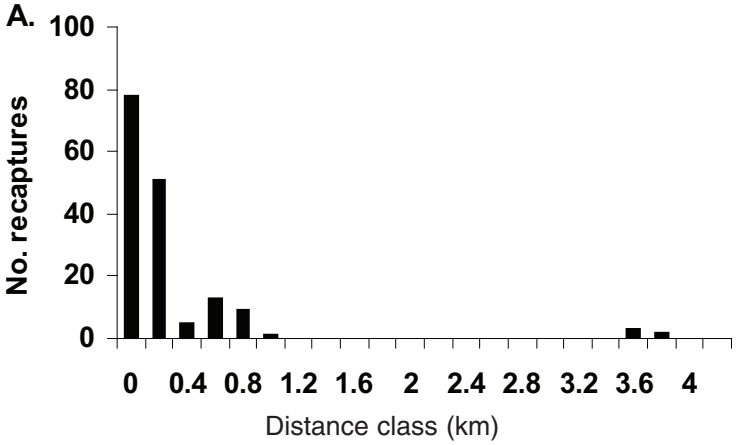
For more than 20 years William Newmark and his team have been collecting field data on the relationship between forest fragmentation and disturbance and understory bird species and communities in the Usambara Mountains. With funding from CEPF, the team has focused on understanding how forest structure and disturbance affect the movements, survivorship, and natality of understory birds. CEPF funds are also being used to develop land use management guidelines for enhancing ecological connectivity between forest patches in the East Usambara Mountains and to train local ornithologists.

Newmark's work has found that forest fragmentation threatens the biodiversity of the Eastern Arc Mountains in different ways. Fragmentation isolates populations; reduces population size; modifies micro-climate and affects rates of pollination, predation, seed dispersal and predation of plant species on which the birds depend.

The study has also found that the impact of ecological perturbations is often only detectable over long time periods and that extreme care needs to be taken in interpreting short-term assessments of human disturbance on biological communities in tropical forests as the recovery time from forest disturbance for many bird species is at best very long. Of particular concern is the finding that even very limited harvesting and utilization of resources have very long-term impacts on bird communities in the Usambara Mountains. Another alarming finding of this long term study is that some bird populations studied have declined by 30 – 40% since the start of this study. This highlights the importance of maintaining and protecting primary forest in the Eastern Arc Mountains as it is critical for the conservation of many species.

These data are critical in the design of wildlife corridors and has highlighted that the success of wildlife corridors in the Eastern Arc Mountains depends upon patterns of movement and survivorship of the wildlife within corridors.

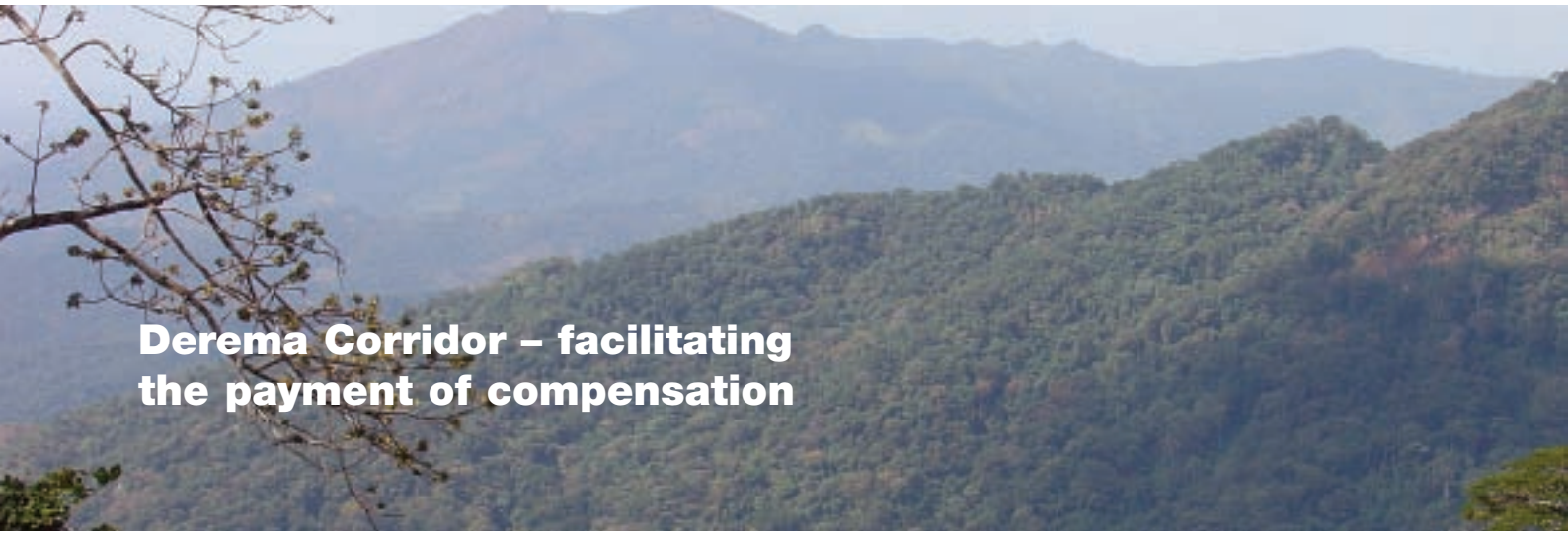
William Newmark



Frequency of distance birds move between forest fragments. The study has found that some understory bird species will not even cross a non-forest canopy gap of 100 m width.

African Broadbill. Photo by Nike Doggart

the Usambara Mountains



Derema Corridor – facilitating the payment of compensation

Grantee: WWF TPO
Timescale: Jul 2005 – Dec 2007

Background

The WWF Tanzania Programme Office have been monitoring the compensation process for the Derema corridor in the East Usambaras. With funding from CEPF, WWF-TPO will continue to work with communities to advise on the compensation process. Once the compensation process is completed, WWF TPO will follow through on facilitating the gazettement of the forest as a Central Government Forest Reserve and on establishing participatory forest management.

The Derema Corridor is a major forest corridor that links the Amani forests in the south of the East Usambara Mountains with other Forest Reserves further north. It is one of five priority sites for forest connectivity identified in the CEPF Ecosystem Profile. Cardamom farming and tree cutting within the Derema forest raised concerns about the potential loss of this forest and the threat this poses to the maintenance of values and functions of the forest ecosystem. Since 2005 the corridor has been subject to a compensation and resettlement process for farmers with plots within the forest. Funds to cover compensation payments have been committed by the Government of Tanzania, Government of Finland, the Global Conservation Fund of Conservation International and the World Bank.

Sketch map showing the location of the proposed Derema Forest Reserve

Compensation and Settlement

Under the Tanzania Forest Conservation and Management Project, implemented through a World Bank Credit, a Resettlement Action Plan for Derema Corridor has been developed. The plan investigated the compensation process including identification of institutional responsibilities for implementation, supervision and monitoring of compensations – including a grievance channel, and guidelines for compensation (entitlement, rationale and formula for compensating asset losses).

Unfortunately the compensation process, which began in 2005, has been delayed. In October 2005, 600 million shillings was paid prior to the December elections. Communities are still waiting for the balance. In addition there were problems in the way that the compensation was paid with some farmers receiving cheques for less than 2000 shillings. This obviously has negative implications for the natural environment for which the corridor is designed to protect and there is frustration on both sides concerning the gazettment of the corridor. Until both the compensation and gazettement processes are completed, participatory forest management can not be initiated.

Lessons Learnt from Derema

- Compensation is a costly exercise and therefore requires solid commitments.
- Funds required to pay individuals their compensation must be available on time.
- Provision of timely and reliable information to the affected communities is vital.
- Compensation schemes require very careful planning and implementation.
- A sound compensation scheme has the potential to improve people's lives and improve the conservation status of an area – a bad compensation scheme has the opposite effect.

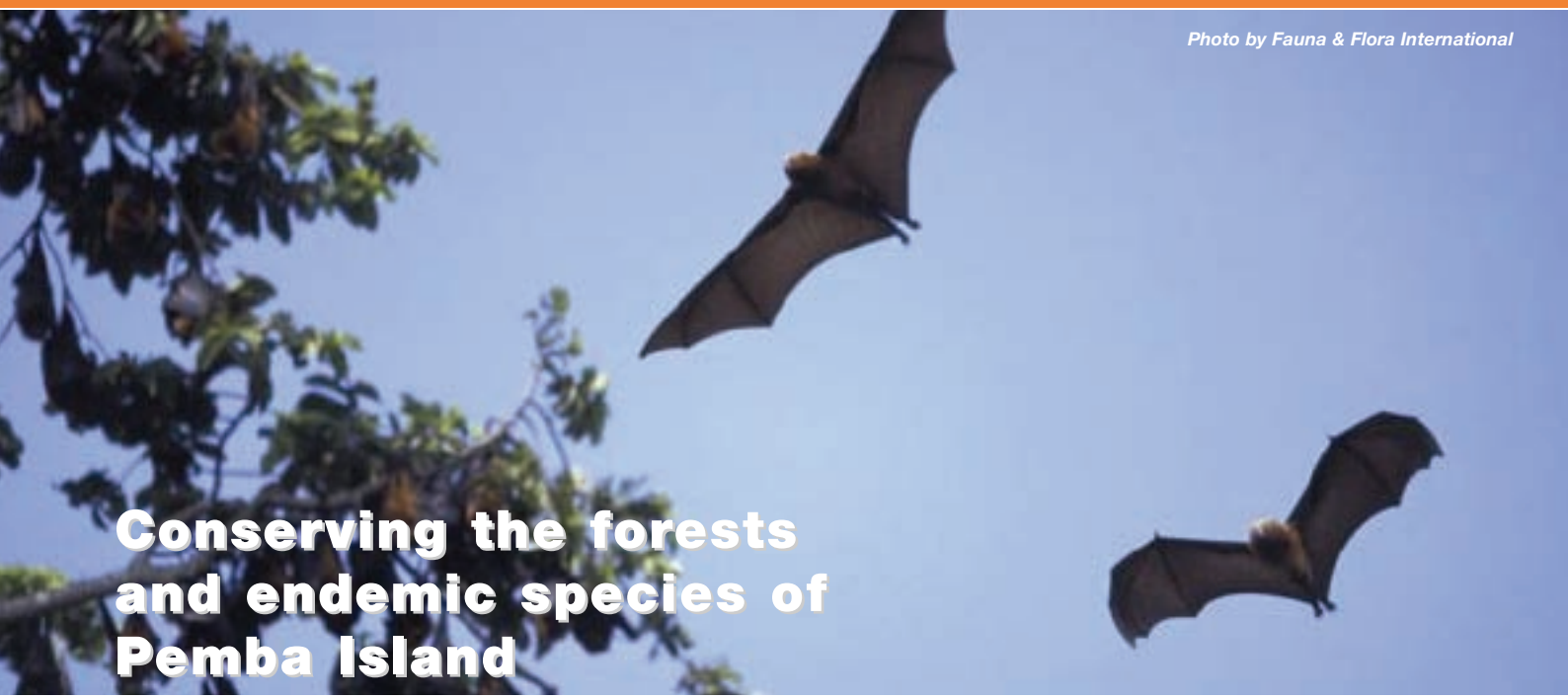


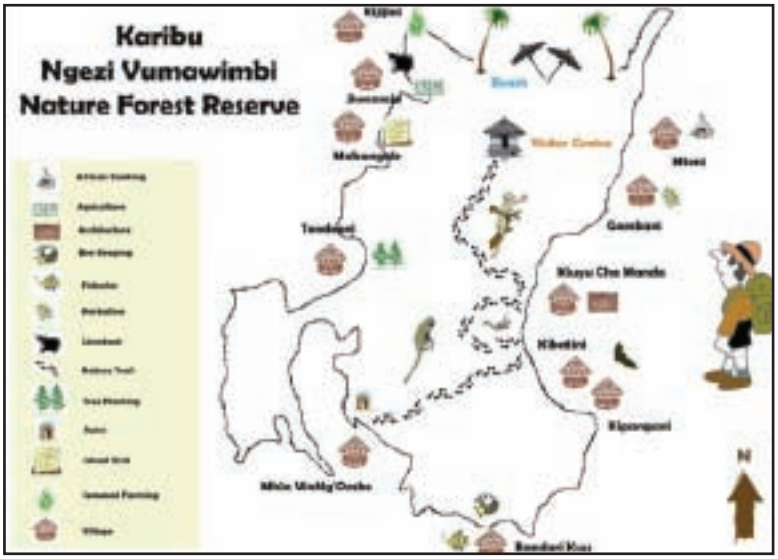
Photo by Fauna & Flora International

Conserving the forests and endemic species of Pemba Island

Grantee: Fauna & Flora International in partnership with the Department of Commercial Crops Fruits and Forestry, Zanzibar
Timescale: Jul 2005 – Jun 2007

Pemba Island is home to several endemic species including the Pemba Island flying fox, the Pemba scop's owl, the Pemba blue duiker and many other species that all depend on the remaining tracts of coastal forest. CEPF provided finance to Flora and Fauna International to protect coastal forest remnants and the resident endemic and endangered species that they contain by: identifying and popularising biodiversity values; developing management plans and monitoring systems and establishing linkages between different stakeholders for the conservation of biodiversity.

The project has focused on two recently gazetted Forest Nature Reserves Ngezi Vumamawimbi (2,990 ha) which is located in the northwest of the island and Msitu Mkuu (180 ha) which is located in the northeast. These two forests represent the only opportunities to conserve coastal forest biodiversity values on an appropriate scale on Pemba Island.



Nature trail map for Ngezi Vumawimbi Nature Forest Reserve. Produced with CEPF finance by Fauna & Flora International

The implementation of this project has so far been very successful. Biodiversity inventories for both forests have been undertaken. Species monitoring tools have been developed and are being used to collect much needed information regarding blue duiker, Pemba flying fox, Pemba scops owl, tree hyrax, the introduced *Maesopsis eminii* and illegal activities within the Reserves. Management Plans for both Reserves are in the final stages of development and draft guidelines for tourism investors have been produced, including nature trail maps. Efforts to eradicate *Maesopsis eminii* from the forests are also underway and community members have received training on natural resource management and nature based entrepreneurship, including sustainable income generating activities such as weaving.

Pemba flying fox *(Pteropus voeltzkowi)*

With a wingspan of more than 100 cm and weighing up to 650 g the Pemba flying fox is easy to spot particularly as they roost during the day in exposed trees in relatively large colonies. As with other species of fruit bat the Pemba flying fox is dependent upon a year-round supply of fruits and flowers to sustain it. Fruit bats play an important roll as pollinators as they visit arboreal flowers for nectar they also disperse seeds of fruits, thus in open habitats fruit bats play an important role in reforestation.

Maesopsis eminii – an invasive species

In 1979 The Revolutionary Government of Zanzibar began to clear forests on the north of Pemba in preparation for the cultivation of rubber. Subsequently efforts were made to reforest affected areas. Initially an attempt was made to restore the forest by using Maesopsis seedlings. Maesopsis is a fast coloniser but it is also a competitive species, as such it threatened to out-compete indigenous plant species, leading to a change in forest structure. This project has started attempts to remove Maesopsis from the area using a tree-barking technique. The project is evaluating this method relative to seedling removal.

Filming of the BBC World 'Villages on the Frontline' at Amani Nature Reserve. Photo by Daniel Mwaifunga

'TALK' (Training, Awareness, Learning and Knowledge) about the Eastern Arc and Coastal forests of Kenya and Tanzania

Grantee: the Tanzania Forest Conservation Group
Timescale: Feb 2006 – Jan 2008

The Tanzania Forest Conservation Group has been involved in environmental education and awareness raising about the Eastern Arc and Coastal Forests for over 20 years. With funds from CEPF, TFCG are using a variety of media to communicate about the region through the 'TALK' - Training, Awareness, Learning and Knowledge project. TALK aims to bring to the attention of millions of people the values of the Eastern Arc and Coastal Forests.

In early 2006, the project launched a coastal forest website http://coastalforests.tfcg.org. The website includes profiles and maps of all of the major coastal forests of Kenya and Tanzania. There are also many downloadable reports. The website will be regularly updated and researchers and organisations working in the coastal forests are encouraged to post their reports on the site by sending them electronically to tfcg@tfcg.or.tz.

TALK has also supported a 25 minute documentary broadcast on BBC World in November 2006 as part of a series called Villages on the Front Line. The documentary highlighted how communities are finding solutions to the problems of deforestation in the region. It is estimated that over 100 million people watched the programme. The programme was also broadcast by local channels within Kenya and Tanzania. TFCG are now preparing a Swahili edition.

Over the next year, the TALK project will be organising drama and music competitions involving communities in Iringa, Morogoro and Rufiji focusing on links between forests and climate change. The competitions will culminate in performances by winning groups during World Environment Day celebrations in the three regions. TALK will also be printing materials including posters, leaflets, a booklet and stickers about the Eastern Arc and Coastal Forests as well as a simple guide to natural resources policies and laws for communities.

TFCG STAFF

Charles Meshack	Executive Director
Nike Doggart	Senior Technical Advisor
Adrian Kahemela	National Coordinator - EMPAFORM
Amiri Said	Project officer - Amani Butterfly Project
Secelela Balisidiya	Information Officer - EMPAFORM
Bettie Luwuge	Programme Assistant - EMPAFORM
Charles Leonard	Research Officer
Daines Mgidange	Assistant Project Officer - Amani
David Loserian	Landscape Officer South Ngurus
Elisa Pallangyo	Education Officer - Ulugurus
Eustack M. Bonifasi	Project Officer - East Usambara
Hamadiel Mgalla	Project Officer - Mufindi
Moses Mwang'oka	Botanical Collector
Phillipo Mbaga	Project Officer - East Usambara
Rahima O.Njaidi	Organisational Strengthening Officer
Raymond D. Nlelwa	Project Officer - Ruvu South
Shukuru Nyagawa	Education Officer
Simon Mosha	Project Officer – Coastal Forests
Adam Mgovano	Project Assistant - Mufindi
Christina Lizie Chawalla	Project Assistant - South Ngurus
Edina Yohana	Project Assistant - East Usambaras
Ernest Benson	Project Assistant - South Nguru
James G. Msuya	Project Assistant - Amani Butterfly Project
Moses Zulumano	Project Assistant - East Usambaras
Nicolas Kisonga	Project Assistant - Mufindi
Peter Cosmas	Project Assistant - East Usambaras
Peter O. Mgonja	Project Assistant - West Usambaras
Revocatus W. Njau	Project Assistant - West Usambaras
Wilfred Teddy	Project Assistant - East Usambaras
Yahaya.M.Mtonda	Project Assistant - Ruvu South
Christina Ntambi	Account Assistant
Theopista A. Byekwaso	Finance Officer
Valerian Lema	Administration Officer
Daniel Mwaifunga	Senior driver
Abid Mohamed	Driver
Ally Said	Driver
Joseph Kidanka	Driver
Laku Shomari	Office Attendant
Mariam Masanja	Office Attendant

CEPF Funded Projects of the Eastern Arc and Coastal Forests of Kenya and Tanzania

	Project Title	Organisation	Grant awarded (US $)
	Strategic Funding Direction One: Increase the ability of local populations to benefit from and contribute to biodiversity conservation		
1	**Forest Use and Conservation of Biodiversity in Witu Forest**	Danish Zoological Society	19,942
2	**Mangabey Educational Tourism Project in the Udzungwa Mountains, Tanzania: Phase 1**	Trevor P. Jones	20,000
3	**Protecting Biological Diversity on Unilever's Mufindi Tea Estate**	Unilever Tanzania Limited	20,000
4	**Managing the Interface between Forest Product Extraction and Rural Livelihoods in the Eastern Arc Mountains and Coastal Forests**	TRAFFIC International	100,000
5	**The Wildlife Works / Verde Ventures Kasigau Reforestation Project**	Wildlife Works EPZ Limited	18,154
6	**TALK (Training, Awareness, Learning, and Knowledge) about the Eastern Arc and Coastal Forests of Kenya and Tanzania**	Tanzania Forest Conservation Group	143,600
7	**Socioeconomic Study of the Udzungwa Scarp Area: A Potential Wildlife Corridor**	World Wide Fund for Nature (TPO)	20,000
8	**Assessment of Tumbatu Flora and Fauna Species**	Jongowe Environmental Management Association	7,000
9	**Community Biodiversity Conservation Micro-Grants in the Eastern Arc and Coastal Forests of Kenya and Tanzania**	World Wide Fund for Nature (EARPO)	400,000
10 11	**Conservation of Zanzibar's Unique Flora and Fauna via Community-Based Forest Management and Socioeconomic Development Around Jozani-Chwaka Bay National Park**	Wildlife Conservation Society Care International	83,077 91,908
12	**Promoting Community Involvement in Resource Protection in and around the Boni-Dodori-Kiunga Protected Area Complex**	Africa Conservation Fund (Kenya)	19,930
13	**The Amani Butterfly Project**	Tanzania Forest Conservation Group	9,880
14	**Investigating the Benefits of Participatory Forest Management in Uluguru Forest Reserves**	Wildlife Conservation Society of Tanzania	19,933
15	**Agroforestry Activities Around Arabuko Sokoke**	Mabuwani Women Group	10,300
16	**Equator Ventures** A partnership initiative with UNDP's Equator Initiative. Implement loan and technical assistance packages to small- to medium-sized enterprises benefiting biodiversity and local communities, and monitor biodiversity results.	Conservation International This is a multiregional project covering eight hotspots; the total grant amount is $99,986.	11,100
17	**Aerial Monitoring of Vegetation Quality, Cover, and Threats of the Forests of the Eastern Arc Mountains, Tanzania**	Wildlife Conservation Society	147,000
18	**Conservation and Management Policy Development**	Kaya Muhaka Forest Conservation Organization	19,383
19	**Business-Oriented Conservation and Agroforestry Initiatives in Muheza District, Tanzania**	JP First	19,822
20	**Promotion of Nature-Based, Sustainable Businesses for Forest-adjacent Communities in the East-Usambara-Tanga, Taita Hills, and Lower Tana River Forests**	International Centre of Insect Physiology and Ecology	500,000
21	**Evaluation of Tanzania Forest Conservation Group's Participatory Forest Management Initiatives in the Eastern Arc**	Tanzania Forest Conservation Group	35,686
22 23	**Instituting a Standardized Sustainable Biodiversity Monitoring System in the Eastern Arc / Coastal Forests of Tanzania and Kenya**	Conservation International, Centre for Applied Biodiversity Science Birdlife International	73,462 351,947
24	**Conserving Coastal and Eastern Arc Forests Through Community Access to Retail Markets for Good Wood Wood Carvings on the South Coast of Kenya**	Wakuluzu: Friends of the Colobus Trust Ltd.	19,999
25	**Do Payments For Environmental Services Offer the Potential For Long Term Sustainable Financing?**	World Wide Fund for Nature	19,800
26	**Kaya Kinondo Community Ecotourism Project**	Strengthening Livelihoods Secures Future for Forest	19,915
27	**Capacity Building to Empower Community Conservation**	Kasigau Conservation Trust	11,285
28	**Baseline Carbon Storage Assessment of Kenya's Coastal Forests**	International Centre of Insect Physiology and Ecology	16,447
29	**CEPF Investment Coordination and Sustainability in the Eastern Arc / Coastal Forests Hotspot**	International Centre of Insect Physiology and Ecology	780,000
	Strategic Funding Direction Two: Restore and increase connectivity among fragmented forest patches in the hotspot		
30	**Restoring Forest Connectivity in the Udzungwa Mountains**	Tanzania Forest Conservation Group	77,450
31	**Assessing the Potential for Restoring Connectivity and Evaluating Options for Improved Management of the Udzungwa Scarp, Iyondo, Matundu, and Nyanganje Forest Reserves in the Udzungwa Mountains of Tanzania**	Museo Tridentino di Scienze Naturali	79,035
32	**Army Ants in the Fragmented Forests of Taita Hills and Lower Tana River**	Caspar Schöning	10,000
33	**Conservation Biology of Ecological Indicators to Enhance Connectivity in the East Usambara Mountains, Tanzania**	William D. Newmark	69,865
34	**Restoration and Increase of Connectivity Among Fragmented Forest Patches in the Taita Hills, Southeast Kenya**	Ghent University	105,203
35	**Facilitating the Compensation Payments for the Derema Forest Reserve, East Usambara Mountains**	World Wide Fund for Nature	154,810
36	**Technical Advisor – Conservation Corridors: Eastern Arc and Coastal Forests of Tanzania and Kenya**	Conservation International	119,900
37	**Making Available Free Copies of Coastal Forest Books**	World Wide Fund for Nature (EARPO)	5,375
38	**Restoration and Increase of Connectivity in Taita Hills Forests: Survey and Suitability Assessment of Exotic Plantations**	East Africa Wildlife Society	20,000
39	**Rehabilitation and Restoration of Mwambirwa Forest**	East Africa Wildlife Society	19,409
40	**Rehabilitation of Chawia Forest for the Conservation of Its Flora and Fauna**	East Africa Wildlife Society	18,990
41	**Resource Center for the Provision of Information and Technical Advice to Local Stakeholders in Forest Restoration Work in Taita Hills**	East Africa Wildlife Society	19,988
42	**Facilitating a Process of Stakeholders Consultations on the Interventions Required to Restore and Increase the Connectivity of Forest Patches in Taita Hills**	East Africa Wildlife Society	17,905
43	**Standardizing Forest Change Methodologies Between Sokoine University and CABS to Assist in Identifying Connectivity Priorities Across the Eastern Arc and Coastal Forests**	Conservation International, Center for Applied Biodiversity Science	7,203
44	**Facilitating the Process of Designing CEPF / GCF Connectivity Interventions in the Udzungwa Mountains Area**	World Wide Fund for Nature	20,000
45	**Rapid Environmental Impact Assessment of the Rehabilitation of theTana Delta Irrigation Project with Design of Critical Primate Habitat Improvement, Increased Indigenous Forest Connectivity and Community Woodlots**	National Museum of Kenya	20,584
46	**Improving the Conservation of Magombera Forest and Community Livelihoods**	World Wide Fund for Nature (TPO)	70,000

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46	**Improving the Conservation of Magombera Forest and Community Livelihoods**	World Wide Fund for Nature (TPO)	70,000
	Strategic Funding Direction Three: Improve biological knowledge in the hotspot		
47	**Assessment of the Amphibian Species Diversity, Population Status and Trends within the Forest Fragments of the Taita Hills, Kenya**	Dr. G. John Measey	65,000
48	**Trends in the Health of Selected Forests in the Eastern Arc and Coastal Forest**	West Chester University	45,519
49	**Biodiversity Research and Awareness in the Lesser Known Eastern Arc Mountains: Mahenge, Rubeho, Ukaguru, and Nguru**	The Society for Environmental Exploration – Frontier Tanzania	224,369
50	**Malundwe's Afromontane Forest and River Catchments: Discovery and Capacity Building**	Anglia Ruskin University	30,000
51	**Conservation of Indigenous Forest and Endemic Species on Pemba Island**	Fauna & Flora International	49,000
52	**Small Mammal Studies in Three Important Eastern Arc Mountains Sites for the Creation of Innovative Educational, Scientific, and Conservation Tools**	The Field Museum of Natural History	150,000
53	**Making Data Available on the Species and Sites of the Eastern Arc and Coastal Forest Hotspot in Tanzania**	University of Dar es Salaam	75,000
54	**Ethnobotanical Knowledge for Adaptive Collaborative Management at Mt. Kasigau, Kenya**	Miami University	19,900
55	**Filling the Knowledge Gap: Surveys of Poorly Known Sites and Species in the Eastern Arc and Coastal Forests**	Tanzania Forest Conservation Group	237,870
56	**Biodiversity Assessment and Monitoring of the Insect Fauna in the Eastern Arc Mountains and Coastal Forests Using Ground-Dwelling Ants and Beetles as Indicator Groups**	AfriBugs CC	212,628
57 58	**Plant Conservation Assessment in the Eastern Arc Mountains and Coastal Forests Mosaic of Kenya and Tanzania**	IUCN – The World Conservation Union Missouri Botanical Garden	112,000 318,001
59	**The Forgotten Coastal Forests of Mtwara: A Reconnaissance to Prioritize Biological Knowledge for Community Conservation Initiatives**	The Society for Environmental Exploration – Frontier Tanzania	69,037
60	**Overview of Butterfly Faunas of Eastern Arc Mountains and Coastal Forests: Biodiversity, Endemism, Conservation**	African Butterfly Research Institute	19,700
61	**Documenting Four Thematic Issues of the Journal of East African Natural History**	East Africa Natural History Society	120,000
62	**Assessment of the Conservation Status of the Newly Discovered Mangabey Rungwecebus kipunji in the Udzungwa Mountains of Tanzania**	Trevor P. Jones	18,692
63	**Coordination, Facilitation and Dissemination of Research Works within the Critical Ecosystem Priority Sites, Tanzania**	Wildlife Conservation Society of Tanzania	20,000
64	**Field Guide to the Moist Forest Trees of Tanzania**	University of York	19,697
65	**Conservation Ecology of the Endangered Endemic Sanje Mangabey (Cercocebus sanjei) of the Udzungwa Mountains, Tanzania**	Carolyn L. Ehardt	13,000
66	**Preventing Unsustainable Timber Trade from the Coastal Forests of Southeast Tanzania Following Completion of the Mkapa Bridge**	TRAFFIC International	19,999
67	**Scientific Advisor for the Eastern Arc Mountains and Coastal Forests of Tanzania and Kenya Hotspot**	Conservation International	90,400
68	**Managing CEPF's Outcomes Database for the Eastern Arc Mountains and Coastal Forests Of Tanzania and Kenya Hotspot**	East Africa Natural History Society	9,998
69	**Chytrid Distribution and Pathogenicity Among Frogs of the Udzungwas**	Wildlife Conservation Society	19,999
70	**Primates on Mt. Kasigau, Kaya Rubai and Along the Tana River, Kenya: Preparing for Red List Assessments and Conservation Action**	Conservation International	19,900
	Strategic Funding Direction Four: Establish a small grants program in the hotspot (all 161 sites eligible) that focuses on critically endangered species and small-scale efforts to increase connectivity of biologically important habitat patches		
71	**A Second Population Assessment of the Uluguru Bush Shrike Malaconotus Alius, Uluguru Mountains**	Wildlife Conservation Society of Tanzania	14,577
72	**Assessment of Overall Spider Diversity and Establishment of the Status and Ecology of Two New Species of Spiders *Toxoniella taitensis* and *Toxoniella rogoae* From Taita Hills**	National Museum of Kenya	17,902
73	**Small Grants for Building Research Capacity Among Tanzanian and Kenyan Students**	Birdlife International	200,000
74	**Assessment of Baseline Ecological and Socioeconomic Factors for Forest Restoration Planning in the Bunduki Gap of the Uluguru Mountain Forests of Tanzania**	CARE International	6,628
75	**Threatened Plant Species of not yet Surveyed Coastal Forest Patches in Handeni District, Tanzania**	Adansonia Consulting	15,300
76	**Population Density Estimates and Threats Evaluation of the Highly Endangered Udzungwa Forest Partridge in the Udzundwa Mountains of Tanzania**	University of Copenhagen	19,778
77	**Making Available Copies of WWF Ecoregion Books**	World Wide Fund for Nature (EARPO)	19,000
78	**Instituting a Biodiversity Monitoring System of Globally Threatened Species in Dakatcha Woodland**	East Africa Natural History Society	19,978
79	**Population Estimates of Threatened Birds in the East Usambara Mountains, Tanzania**	The Field Museum of Natural History	19,960
80	**Biodiversity of a Landscape: Examining Forest Heterogeneity and Ecological Change in the East Usambaras Since 1975**	University of Florida	15,860
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Tanzania Forest Conservation Group
Shirika la Kuhifadhi Misitu ya Asili Tanzania
PO Box 23410,
Dar es Salaam, Tanzania
Tel. +255 (0) 22 2669007

TFCG is grateful to the following for their support:
African Rainforest Conservancy
Critical Ecosystem Partnership Fund
European Union
Ministry of Foreign Affairs, Finland
McKnight Foundation
UNDP / GEF
Unilever

This special edition of the Arc Journal is part of TFCG's commitment to ensure that stakeholders within civil society and government are aware of the CEPF process, goals and achievements and are sharing experiences.

Electronic information on CEPF's investment in the Eastern Arc and Coastal Forest Region can be found at http://cepf.tfcg.org and at http://www.cepf.net

About the Tanzania Forest Conservation Group
Established in 1985, the Tanzania Forest Conservation Group is a Tanzanian non-governmental organisation promoting the conservation of Tanzania's high biodiversity forests.

TFCG's Vision
We envisage a world in which Tanzanians and the rest of humanity are enjoying the diverse benefits from well conserved, high biodiversity forests.

TFCG's Mission
The mission of TFCG is to conserve and restore the biodiversity of globally important forests in Tanzania for the benefit of present and future generations. We will achieve this through capacity building, advocacy, research, community development and protected area management, in ways that are sustainable and foster participation, co-operation and partnership.

TFCG supports field based projects promoting participatory forest management, environmental education, community development, advocacy and research in the Eastern Arc Mountain and Coastal forests. TFCG also supports a community forest conservation network that facilitates linkages between communities involved in participatory forest management. To find out more about TFCG please visit our website at www.tfcg.org

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The Arc Journal:
Newsletter of the Tanzania Forest Conservation Group
Editor: Nike Doggart
Assistant Editor: Freya St. John
Founding Editor: Carter Coleman
This edition was supported by the Critical Ecosystem Partnership Fund.
The Arc Journal welcomes articles on forest conservation and biodiversity in Tanzania. If you would like to contribute, please send your article to the Editor by e-mail at tfcg@tfcg.or.tz with high resolution digital photographs and maps.
Our next edition is due out in July 2007.