

# Update on Habitat Loss and Conservation Status of the Endangered Zanzibar Red Colobus on Uzi and Vundwe Islands



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## Summary

Uzi and Vundwe Islands contain a significant and behaviourally and ecologically unique population of the endangered Zanzibar red colobus (*Procolobus kirkii*). Recent surveys found that the conservation status of this flagship species and its habitat on these islands is critical and requires immediate action. Reported poisoning and disappearance of colobus, netting of monkeys and other animals, and widespread and extensive destruction of coral rag forest are ongoing. A collective effort will be needed to protect these monkeys and their habitat, and inform and mobilize the community. Recommendations include immediate initiation of the process to gazette southern Uzi and Vundwe Islands as a Forest Reserve; support on the ground for the local forestry officer to establish a community based forest conservation project; and assistance to the community in developing primate-focused nature tourism and other income-generating activities.

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## Authors

K. Nowak<sup>1</sup> conducted her PhD fieldwork on Zanzibar red colobus (*Procolobus kirkii*) on Uzi and Vundwe Islands between 2003 and 2005. A. Perkin<sup>2</sup> specializes in nocturnal primates and was visiting Uzi and Vundwe to confirm the presence of the Zanzibar galago (*Galagoides zanzibaricus zanzibaricus*) and Garnett's greater galago (*Otolemur garnettii garnettii*) and their occurrence in mangrove habitat. T. Jones<sup>3</sup> studies primates and duikers in the Udzungwa Mountains and is an experienced ornithologist. They were accompanied by Said Fakh, botanist from the Department of Commercial Crops, Fruits and Forestry (DCCFF) and Assistant Director of the WCS-Zanzibar Project; and by Mwinyi Khamis Mwinyi, local inhabitant of Kichanga Dowe, Southern Uzi Island, with experience of mangrove monkeys and habitat, former field assistant to Nowak and currently assisting WCS with red colobus monitoring.

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*Cover photos (by A. Perkin): Zanzibar red colobus adult male from Vundwe group runs along the northwestern beach of Vundwe Island and extent of forest destruction on Mchangamle peninsula in western Uzi Island.*

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## Abbreviations and Acronyms

DCCFF - Department of Commercial Crops, Fruits and Forestry  
ZRC – Zanzibar Red Colobus  
JCBNP – Jozani Chwaka Bay National Park  
ZILEM – National Land Use Plan  
UN-FAO – United Nations Food Aid Organization  
WWF – World Wildlife Fund  
WCS – Wildlife Conservation Society  
REDD – Reducing Emissions from Deforestation and Forest Degradation  
TFCG - Tanzania Forest Conservation Group

All photographs included in this report were taken on this trip (with the exception of Figs. 2 and 4-A) and by K. Nowak unless credited otherwise.

## Background

### **Description of Uzi and Vundwe Islands**

Uzi and Vundwe Islands (6°18'–6°24' S and 39°23'–39°26' E) lie along the Uzi Channel on the southwest coast of Unguja, south of the Jozani Chwaka Bay National Park (JCBNP) and approximately 25 kilometers from Stone Town (Fig. 1). Uzi is connected to Unguja by a narrow isthmus of tidal mangrove swamp. The two main villages, Uzi Uzi and Uzi Ng'ambwa, have a combined population of approximately 3,000 people who depend on traditional agriculture, inter-tidal harvesting and fishing.

Uzi has an area of 15.6km<sup>2</sup> with at least 60% of land converted to agriculture and used for habitation, with both shamba and habitation concentrated in the eastern part of the island. The remaining area is abandoned farmland, scrub, patches of coral rag and mangrove. Mangroves occur in the north and northwest, south and southeast and are dominated by *Rhizophora mucronata* (Nowak, 2008). Forest encroachment in the centre of Uzi Island was just beginning in 2005. Most coral rag forest on Uzi is secondary with a canopy height of 15m or less (Silkiluwashwa, 1981); however, in 2005, remnant patches of high coral rag forest (up to 25m in height) could still be found along the island's western side (particularly Mchangamle peninsula; Fig. 1) but have since been heavily exploited. The Mchangamle forest supported a diverse fauna including large mammals such as bushpig (*Potamochoerus larvatus*) (Nowak, pers. obs. 2003–2005).

Vundwe Island lies 300m from the southern tip of Uzi, is uninhabited by people, and has an area of 1.4km<sup>2</sup>. Its high forest has tall relict trees such as baobabs (*Adansonia digitata*) historically found at higher densities on Uzi.

### **Previous research**

Silkiluwashwa (1981) conducted an island-wide survey of Zanzibar red colobus (ZRC) in the late 1970s to early 1980s. He included Uzi Island among areas characterized as 'high' with respect to colobus density.

Four short (one-month) studies by students from the School for International Training (SIT) were conducted in northern and northwestern Uzi Island focusing specifically on ZRC. Snyder (1996) and Othman and Rijali (1997) estimated approximately 200 ZRC in this area of Uzi, where later, Stewart (1998) and Aylward (2001) estimated less than 100. These northern areas likely support very few, if any, colobus today.

The ZRC of southern and western Uzi and Vundwe Islands were the focus of PhD ecological and behavioural research from 2003 to 2005 (Nowak, 2007). On the basis of 14 months of surveys along three census transects (Fig. 1), a minimum of 1000 and a maximum of 1800 colobus (between 50 and 70 groups) were estimated on Uzi and Vundwe Islands (Nowak, 2007). Compared with Kiwengwa-Pongwe Forest Reserve, where Nowak established four transects, Uzi and Vundwe supported (as of 2005) up to four times the number of colobus as Kiwengwa, likely making Uzi and Vundwe second to JCBNP in colobus density. The Uzi and Vundwe ZRC sub-population therefore represented at least 25% of the total remaining ZRC population on Unguja.

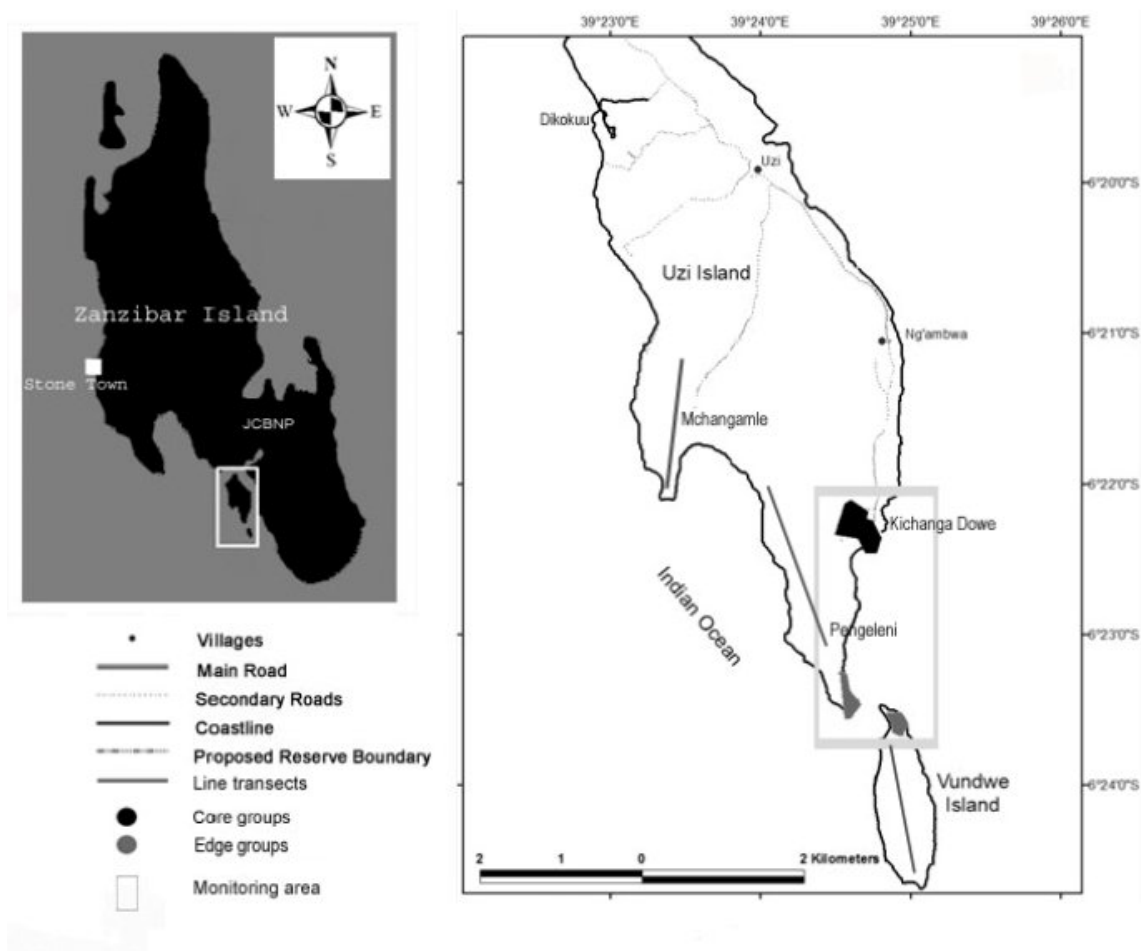
Nowak habituated and studied three focal groups of ZRC in Kichanga Dowe mangroves, and two groups at Pengeleni (southern tip of Uzi) and Vundwe Island (Fig. 1; see also Appendix II). Groups in mangrove forest were found to have larger group sizes, more heterogeneous age structure, were more stable and had higher rates of infant survival than did groups in northern coral rag in Kiwengwa. Mangroves, even though they are plant species-poor (five species of mangroves are found at Kichanga Dowe) are more productive, less seasonal, and less human-disturbed than coral rag. Colobus groups using mangroves therefore exhibit frequent social play,

an indicator of habitat quality. Mangrove-dwelling colobus were also found to have higher ratios of births per female per year than colobus in coral rag (Nowak, 2007; Nowak and Lee, in review).

Uzi colobus groups use mangrove extensively for up to 85% of observation time (Nowak, 2008), more than in JCBNP, where colobus use mangroves sporadically during times of food scarcity (Siex, 2003). In association with frequent mangrove-use, one exceptional novel behaviour was observed in Uzi mangroves: a high frequency of water foraging and drinking, which appeared to be a response to the low plant species diversity and limited, salty foods in mangroves. The need for a constant supply of water is a new and additional selection pressure on ZRC. Nowak and Lee (in review) suggest that mangroves in Uzi are an important refuge and possibly source habitat for red colobus elsewhere on Zanzibar, especially where coral rag forest habitat is degraded; however, mangroves without adjacent coral rag cannot sustain colobus due to the high salt loading on the diet.

Another red colobus species which uses mangroves for food and shelter is the Senegal red colobus (*P. badius temmincki*) and mangrove-use by this species has been called a 'survival adaptation' (Galat-Luong & Galat, 2005).

**FIG. 1** Map of Uzi and Vundwe Islands showing locations of three line transects and focal colobus groups monitored since 2003 (see also Appendix II).





### **Short history of conservation efforts and fund allocation on Uzi and Vundwe**

#### **1. Institutional framework and status of Uzi and Vundwe forests and ZRC populations**

Southern Uzi and Vundwe Islands have been the subject of several conservation planning exercises since the 1980s. The southern area of Uzi Island was recommended by Struhsaker and Leland (1980) for national park status in 1980 on the basis that it provides the ZRC with habitat types that are absent or rare in Jozani. Uzi Island was described as 'high density' with respect to ZRC and Kiwengwa as 'low density' by Silkiluwasha in 1981 following his island-wide colobus survey. Southern Uzi and Vundwe Islands were designated as proposed reserves in the 1995 National Land Use Plan (ZILEM) and emphasized in Masoud *et al.*'s 2003 Red Colobus Conservation Strategy as 'core conservation areas' for colobus (Appendix I). Nowak's PhD data (2007) from Uzi and Vundwe (collected 2003-2005) confirmed Silkiluwasha's finding that Uzi supports a high ZRC density and that together with Vundwe, likely supports a subpopulation size second to Jozani. The ZRC on Uzi inhabit a mangrove-coral rag matrix that is unique on Unguja and several coral rag species in Uzi and Vundwe are not found in northern coral rag (Nowak, 2007). It has also been suggested that Uzi Island absorbs and may act as the sink for the main (source) colobus population in Jozani (D. Finnie, pers. comm., 2009). As recently as 2005, an intact corridor requiring no regeneration linked southern Uzi and Jozani (through Uzi's western coral rag forests of Pengeleni and Mchangamle to the northern Dikokuu area) and there was evidence of colobus moving through the mangroves north of Uzi into the Pete mangroves south of Jozani (see Fig. 1 and Appendix I).

Uzi remains underdeveloped in comparison to the 'mainland' areas where tourism has benefited many communities including those adjacent to forests. Recent development of ecotourism which promotes primate viewing has concentrated on Kiwengwa. Uzi and Vundwe, whilst not officially on the tourist trail and without hotels, have attracted >100 visitors since 2003 (when a visitor log-book was established at Kichanga Dowe). Visitors have come from Italy, France, USA, Germany, Belgium, Spain, Israel, Madagascar and Congo and visited the mangrove colobus and inter-tidal areas of southern Uzi. Uzi and Vundwe are relatively isolated and have no alternative source of income unlike Kiwengwa, where more than a dozen upscale hotels provide employment opportunities. In 2005, UN-FAO funding for community forest project development went solely to Kiwengwa although the UN-FAO description of southern Uzi was very positive (Hikojiro Katsuhisa, pers. comm.; Fig. 2).

**FIG. 2** UN-FAO visit to Kichanga Dowe mangroves in 2005.



Photo by Kirstin Siex

## 2. Conservation activities

Menai Bay to the west of Uzi became the focus of a WWF conservation project in 1994 and in early 1995, a program was initiated to give technical and financial support to fishermen and women's groups on sustainable fisheries management and development of economic alternatives. WWF Menai Bay project activity has however been mostly focused on marine areas exclusive of mangroves. On Uzi, the project's conservation assistance has been limited to the provision of beehives to a women's cooperative beekeeping group. These hives were placed within the home range of ZRC groups at Kichanga Dowe and were an incentive for mangrove conservation. In 2004, the beekeeping group informed DCCFF that no instruction was ever provided to them and that ants were swarming their coconut hives (preventing bees from using the hives). Recently, WWF Menai Bay Project again donated beehives, this time several top-bar (modern) hives; unfortunately, these hives are sitting unused in the one remaining patch of *Terminalia boivinii* adjacent to Kichanga Dowe mangroves.

WCS has been funding conservation activities in Unguja specifically for ZRC as the main target species (including funding of Nowak's 2003-2005 study in Uzi/Vundwe and Kiwengwa-Pongwe). On Uzi and Vundwe, in 2005, the WCS Zanzibar Project took over the monitoring of the five groups and three transects in Nowak's study, but no direct conservation projects have been enacted on the ground. A basic house has been built at Kichanga Dowe which can accommodate up to two persons. One person from Uzi is currently working with the WCS team in red colobus monitoring.

Other organizations which have recently worked on Uzi include a German NGO which established a solar lamp project at the Uzi school (this project is no longer active as electricity was installed on the island last year) and a women's seaweed project based in Ng'ambwa assisted with funds from a US organization.

## Survey Aim

To assess the current status of the red colobus populations and their coral rag and mangrove habitats on Uzi and Vundwe Islands.

## Survey Results

### ***Areas surveyed and visited***

The observations described here were made during a three-day visit to Uzi and Vundwe in early July 2009. We surveyed three locations: Kichanga Dowe mangroves; southern tip of Uzi Island called Pengeleni; and Vundwe Island. We also visited Mchangamle peninsula, where there was no evidence of the formerly established 1.85km survey transect. These areas and the results of our surveys are described in Table 1.



**TABLE 1.** Areas surveyed and visited and survey results.

Date	Locality	Survey Aims	Survey Results
3 July 2009	Kichanga Dowe mangroves	<ol style="list-style-type: none"> <li>1) To count and observe the four ZRC groups that were present in Kichanga Dowe in 2005</li> <li>2) To survey the mangroves for galagos</li> </ol>	<ul style="list-style-type: none"> <li>• One lone adult individual was observed from Dimbwini group; Beach and Shamba groups were not found. The fourth group was not present.</li> <li>• Drinking containers recently placed, reported to be the source of poisoning of ZRC, were observed (see Fig. 4-B).</li> <li>• Majority of coral rag forest adjacent to mangroves is cut for shamba.</li> <li>• Nets have been put around mangroves in Shamba group range (see Fig. 5).</li> <li>• The Garnett's greater galago and Zanzibar galago were both heard at Kichanga Dowe mangroves, which is highly unusual for these terrestrial forest dwelling primates (see A. Perkin's separate report – Perkin, 2009).</li> </ul>
	Kichanga Dowe mangroves	1) To re-check Kichanga Dowe for ZRC groups	<ul style="list-style-type: none"> <li>• No ZRC groups were seen or heard.</li> <li>• Sykes monkeys were heard within Beach group range.</li> </ul>
4 July 2009	Vundwe Island	<ol style="list-style-type: none"> <li>2) To count and observe Vundwe group in northern Vundwe Island</li> <li>3) To survey Vundwe transect</li> <li>4) To survey Vundwe for galagos</li> </ol>	<ul style="list-style-type: none"> <li>• At least 15 ZRC individuals were estimated in Vundwe group and the group appeared to be healthy.</li> <li>• Five ZRC and five Sykes monkey groups were counted along Vundwe transect. Several piles of suni and blue duiker pellets were found.</li> <li>• Only the Garnett's greater galago was present on Vundwe Island including in the mangroves (Perkin, 2009).</li> </ul>
	Pengeleni	<ol style="list-style-type: none"> <li>1) To count and observe Pengeleni group at the southern tip of Uzi Island</li> <li>2) To count ZRC groups between Pengeleni to Kichanga Dowe</li> </ol>	<ul style="list-style-type: none"> <li>• 19 ZRC individuals were counted in Pengeleni group; these appeared to be healthy and more habituated to observers than during 2003-5.</li> <li>• 2 ZRC groups were counted between Pengeleni tip and Kichanga Dowe.</li> </ul>
5 July 2009	Kichanga Dowe mangroves	3) To re-check Kichanga Dowe for ZRC groups	<ul style="list-style-type: none"> <li>• 9 ZRC individuals were counted in Dimbwini group; these were frightened, highly vigilant of observers, and split into two subgroups. This group was formerly well-habituated, never split into subgroups and had a group size of over 30 individuals.</li> </ul>
	Mchangamle Peninsula	4) To survey along Mchangamle transect	<ul style="list-style-type: none"> <li>• Extensive destruction of forest; no emergent trees remaining (Fig. 3).</li> <li>• No mammals seen or heard on Mchangamle peninsula.</li> </ul>

**FIG. 3** This low bush and shamba on Mchangamle peninsula (western Uzi Island) has replaced what previously was high coral rag forest with 88 tree species, many of them unique to this part of Zanzibar. This forest once linked the southern Uzi forests with those in the north and therefore formed part of the corridor between Uzi and Uzi-Pete mangroves and Jozani.



#### **Summary of key findings**

- 1. The coral rag forest of Mchangamle peninsula, which contained an estimated 15 colobus groups in 2005 (Nowak, 2007) has disappeared over the last four years.** The high coral rag forest (which was similar in condition to that in Kiwengwa) has been replaced by agriculture (Fig.3). Most of the large trees including *Ficus* spp., have been cut. This was a unique forest with species including *Diospyros shimbaensis*, *Ziziphus robertsiana*, *Markhamia zanzibarica*, and wild vanilla *Vanilla roscheri* (specimens identified at Kew Gardens). Mchangamle was more species-rich than Pengeleni and Vundwe and these three areas were much less similar to one another (<70% similar and therefore more unique) than the four transects established in Kiwengwa, which are relatively homogenous in species composition (>90% similar). Of the seven transects (four in Kiwengwa and three in Uzi), Mchangamle forest was the most diverse, supporting the largest number of coral rag species (88 species) compared with Pengeleni (44 species), Vundwe (52 species) and Kiwengwa transects (between 65 and 85 species) even though Mchangamle was the second shortest transect of these seven (1.85km) (see Nowak, 2007 for details).
- 2. Over 50 Zanzibar red colobus are reported to have been killed in Kichanga Dowe mangroves by poisoning drinking water in containers.** Some of these containers were initially placed in mangroves by local people for water provisioning and habituation of groups for tourism (Fig. 4-A). Another method of

poisoning has been to put poison on banana and papaya leaves which one ZRC group (Shamba group) raided. The poisoning of groups is reported to have begun last year. Searches and observations of Nowak's previous study groups support these reports of at least 50 monkeys having been poisoned within the last year. Skulls of some of the poisoned individuals are being kept in Jozani.

**FIG 4-A and 4-B.** Dimbwini group drinking rainwater which collected in a container, placed in mangroves by local people for water provisioning and habituation of groups for tourism (photo taken in 2004)(A). These same containers were used in the poisoning of >20 individuals from Dimbwini group between 2008 and 2009 (B).



*Photo by Trevor Jones*

- 3. The majority of coral rag forest directly adjacent to Kichanga Dowe mangroves has been cut and is now mostly papaya and banana shamba (Fig. 5). The mangrove groups are therefore limited mainly to**



the mangrove forest, which is not sufficient to provide them with a varied and succulent enough diet. Furthermore, monkeys experience water stress in mangroves on account of the high salinity in their diet of mangroves and must forage for and drink fresh water daily (Nowak, 2008).

4. **Kichanga Dowe mangroves are intact and no obvious disturbance of mangroves was observed.**
5. **Villagers have put nets around the mangroves** to keep colobus and Sykes monkeys from leaving the mangroves and entering what is now shamba; monkeys and duiker are reportedly getting trapped in these nets (Fig. 5).

**FIG. 5** A view of nets from inside the Kichanga Dowe mangrove area (Shamba group range). These nets encircle the mangroves to keep colobus and Sykes monkeys inside the mangroves and out of the shamba. This shamba was formerly coral rag forest (as of 2005). Shamba now surrounds much of the mangroves at Kichanga Dowe. Monkeys are not likely to survive on a diet consisting only of mangroves which are high in salt and tannins.



6. **The majority of coral rag forest on Vundwe Island is intact; however, some severe cutting of large trees was observed in the north part of the island (Fig. 6).** Vundwe and Pengeleni ZRC groups appear to be healthy and semi-habituated to observers.
7. **Un-used beehives** were seen in the one remaining patch of *Terminalia boivinii* in the range of Beach group at Kichanga Dowe (Fig. 7). Since these were not the traditional log type beehives it appeared that extension services were insufficient for a successful beekeeping project.
8. **Hotel development - rumour or reality.** Purported hotel plans for Mchangamle beach may have provoked people to cut the Mchangamle forest and plant shamba in hope of compensation from the developer. The facts of this situation are not well understood.

**FIG. 6** Felling of large, live trees has begun in northern Vundwe Island near the fishermen camp. Fishermen have collected fire wood for their uses for many years, but this new cutting is for commercial purposes. Boats are being used to transport the wood to markets. This represents a new and emerging threat to the forest of Vundwe Island as other patches in SW Uzi become depleted and the demand for firewood on Unguja grows.



Photo by Trevor Jones

**FIG. 7** One of the several WWF-granted top-bar beehives sitting un-used in the only remnant *Terminalia boivinii* patch adjacent to Kichanga Dowe mangroves. With additional training, Uzi inhabitants could make use of these.



## Recommendations and Further Research

### *Recommendations for immediate action*

1. Mobilize the village governments and community groups as soon as possible to **establish community-led patrols** of Vundwe and southern Uzi to prevent further forest clearance for any purpose including the establishment of new farming areas and the planting of *Casuarina equisetifolia*<sup>4</sup>, until a longer-term natural resource management program to benefit these communities can be implemented.
2. **Support the current forest officer** in his efforts to monitor and manage the area more effectively, and to establish greater community involvement.
3. **Stop water provisioning**/remove all containers from ranges of ZRC groups in Kichanga Dowe so that no more individuals can be poisoned. Monitor through patrolling to prevent new poison containers from being reset in mangrove trees.
4. **Initiate discussions with the village governments** on improving the habitats of the colobus. Measures to discuss should include:
  - a. The urgent need to remove nets from around mangrove areas.
  - b. The urgent need to stop future poisonings.
  - c. Prevent further cutting of coral rag forest adjacent to mangroves.
  - d. Prevent establishment of more shamba directly adjacent to mangroves with aim to regenerate a coral rag forest buffer zone around the mangrove areas.
5. As part of a wider environmental education exercise emphasize to the village governments that the Zanzibar red colobus is internationally significant, is an endangered and endemic species and that its persecution/poisoning are strictly prohibited.

### *Longer-term recommendations for all stakeholders*

1. Through a participatory land use planning process, facilitate and **expedite full protection status** of the forests as forest reserves or national parks. The production of an updated map of land use zones and initiation of a land-planning process for Uzi and Vundwe should form part of the procedure of upgrading the conservation status of the area.

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<sup>4</sup> The over-planting of exotics and cutting of native forest for plantation of *Casuarina equisetifolia* is already adversely affecting the Kiwengwa-Pongwe forest landscape (pers. obs., Nowak, 2003-2005, 2009).



2. The Government of Zanzibar and the local communities must work together to **establish a Joint Forest Management Agreement or a Community Based Forest Management Agreement** involving the three relevant *Shehias*: Uzi Uzi, Uzi Ng'ambwa and Unguja Ukuu.
3. **Boost agricultural extension services** to help increase farming productivity and marketing from the available land as well as assist with improving honey production and processing.
4. **Train and hire local Uzi people to monitor red colobus** and other animals.
5. **Support the existing tourism group** and the wider community to develop the eco-tourism potential that benefits all community members.
6. **Ensure that ecological and genetic connectivity** of colobus between southern Uzi Island at Pengeleni and northern Vundwe Island is maintained, and potentially enhanced through the regeneration of forest and mangrove at northern Vundwe.
7. Consider and **support other income-generating activities** through a participatory planning process.
8. If land speculation and hotel development proceed in an unplanned way then these could threaten Pengeleni forest as they appear to have affected Mchangamle (see findings), although tourism development policy should regulate this. DCCFF could look into the issue of environmentally damaging hotel development and specifically the impact on forests.
9. DCCFF could work with relevant stakeholders to look into the possibility of **regenerating the forests of the Mchangamle peninsula** as an important corridor between southern Uzi and Pete mangroves.

### ***Suggested scientific research directions***

- Continued monitoring of keystone species including ZRC and Ader's duiker.
- Comprehensive habitat mapping as well as land use change (i.e. forest loss) studies.
- Feasibility study on the potential of habitat restoration and on land allocation/availability for habitat regeneration, including the restoration of connectivity between Uzi and Jozani.
- Sea- and shore-bird monitoring on and from Kichanga Dowe, Pengeleni and Vundwe beaches.
- Camera trapping as part of a full biodiversity study on Pengeleni peninsula and Vundwe Island.
- Study of wildlife use of mangrove for foraging and refuge.
- Forest, mangrove and inter-tidal zone studies and their ecological and socio-economic importance.

- A study of the environmentally most sustainable and appropriate level and type of tourism to benefit the local community.

### ***Potential partners and funding sources***

Several NGOs are in a position to partner with the DCCFF and other government bodies to enact conservation activities on the ground. WCS has an existing monitoring program on Uzi as well as other forest conservation programs on Unguja mainland. CARE Tanzania and DCCFF are designing a proposal to secure funding under the REDD process in which there is a potential to include this area and manage the colobus population mainly through protection of remnant coral rag and mangrove (Thabit Masoud, pers. comm., 2009). The Tanzania Forest Conservation Group (TFCG) is also experienced in community based forest conservation and if invited could assist in forest conservation activities on Uzi and Vundwe Islands (Nike Doggart, pers. comm., 2009).

## **Conclusions**

The state of Uzi Island forests is critical, and encroachment into northern Vundwe is of concern. However, Uzi and Vundwe Islands still contain significant coral rag and mangrove forest habitat, and significant and behaviourally and ecologically unique populations of endangered Zanzibar red colobus, which we believe merit urgent conservation attention.

It was encouraging to observe that the red colobus groups at Pengeleni and Vundwe are doing well (Fig. 8). They are sufficiently habituated for observation, and monitoring should be continued long-term. Forest along Vundwe transect is intact but the cutting at the tip of the island by villagers is of great concern. As Pengeleni transect was not walked, the current status of the forest in southwest Uzi island is not known. Little coral rag forest remains in southeast Uzi thus it is vital that remaining patches be conserved.

Forest clearance and degradation must be controlled as soon as possible. Additionally, the cutting of native forest for plantation of exotics should be prevented or at least regulated. In addition to the other urgent short term recommendations listed above, ultimately, the remaining forest patches should be officially gazetted as forest reserves and managed as part of a community based conservation plan for the sustainable management of forest-mangrove landscape of Uzi and Vundwe Islands. The corridor potential between southern Uzi through the western Pengeleni and Mchangamle forests and northern mangroves into JCBNP should be investigated further; however, it is gone for now unless forest is permitted to regenerate in the western part of the island at Mchangamle.

With the effective conservation of the forests and keystone species such as ZRC, there are exciting opportunities for ecotourism on the island as well as other income generating possibilities. DCCFF is urged to take action, together with relevant stake holders and organizations, to conserve the unique habitats supporting red colobus and other species on Uzi and Vundwe Islands.

**FIG. 8** Adult male ZRC from Pengeleni group feeds on the mature leaves of mangrove *Rhizophora mucronata*. Pengeleni group is the southernmost ZRC group on Uzi Island and the only one with which there may be individual exchange (through dispersal) with Vundwe group in northern Vundwe Island.



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### **SIT reports** (field surveys conducted in northern Uzi Island/Dikokuu area)

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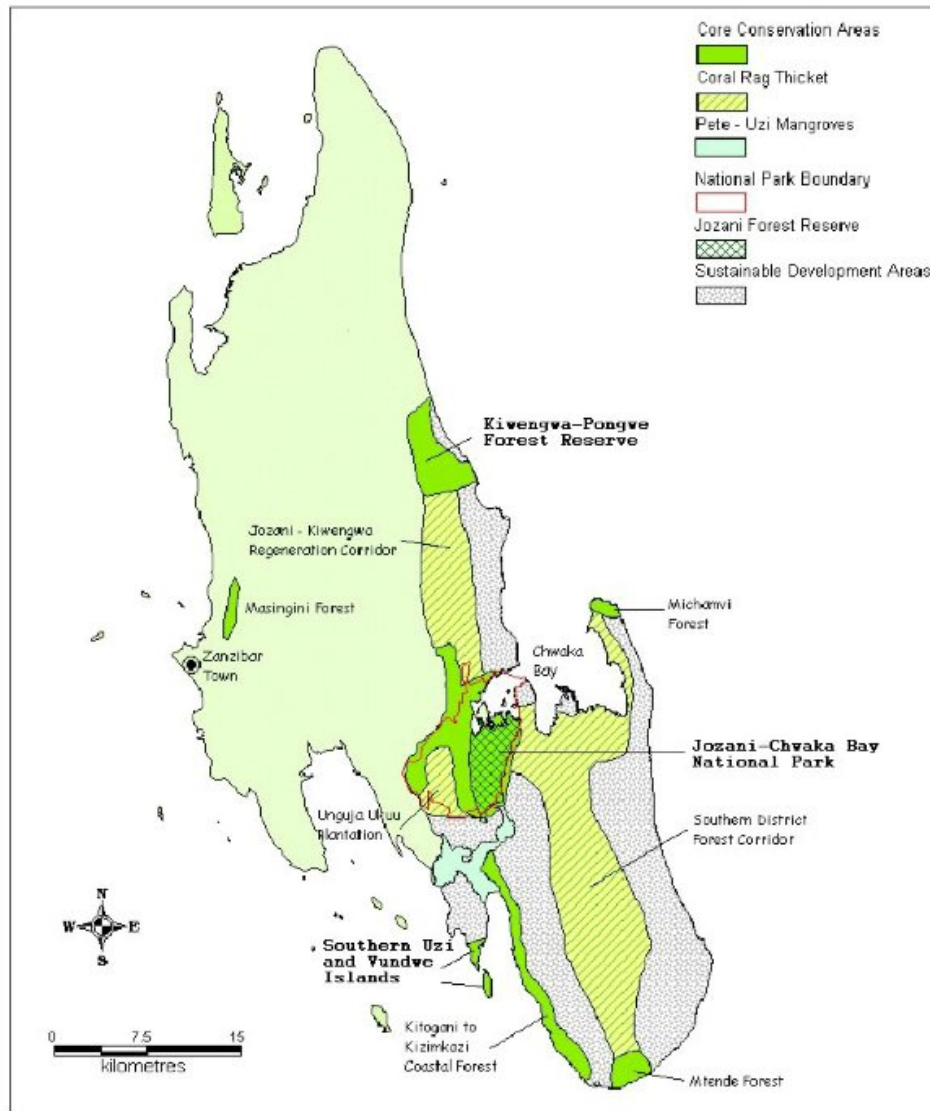
### **Recent SIT project following up from this report:**

- Mease, L. (2009) Survey of anthropogenic vegetation changes on Uzi and Vundwe Islands: A study of deforestation and its implications for people and wildlife. Zanzibar: School for International Training (SIT). Student report. Contact Lindley Mease for a copy: lamease@stanford.edu

## Appendices

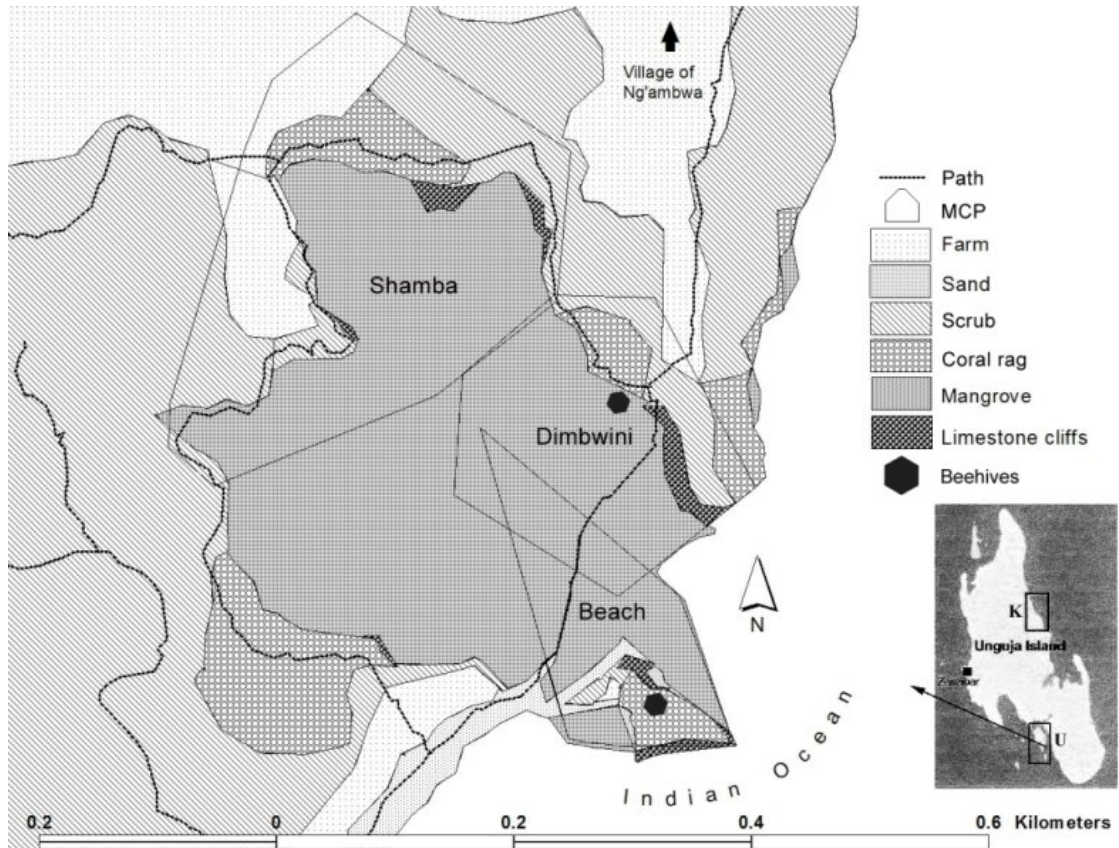
### Appendix I

Map of Unguja modified from Masoud *et al.* (2003) based on the National Land Use Plan (1995), which demarcated Kiwengwa-Pongwe and Uzi and Vundwe as core conservation areas for red colobus. Masoud *et al.* (2003) suggested two major corridors linking forest fragments. Kiwengwa-Pongwe Forest Reserve and Uzi and Vundwe Islands, and the Jozani-Chwaka Bay National Park are indicated in bold text. Ideally, a corridor for preservation would have been recommended along the western side of Uzi to Uzi-Pete mangroves to JCBNP.



## Appendix II

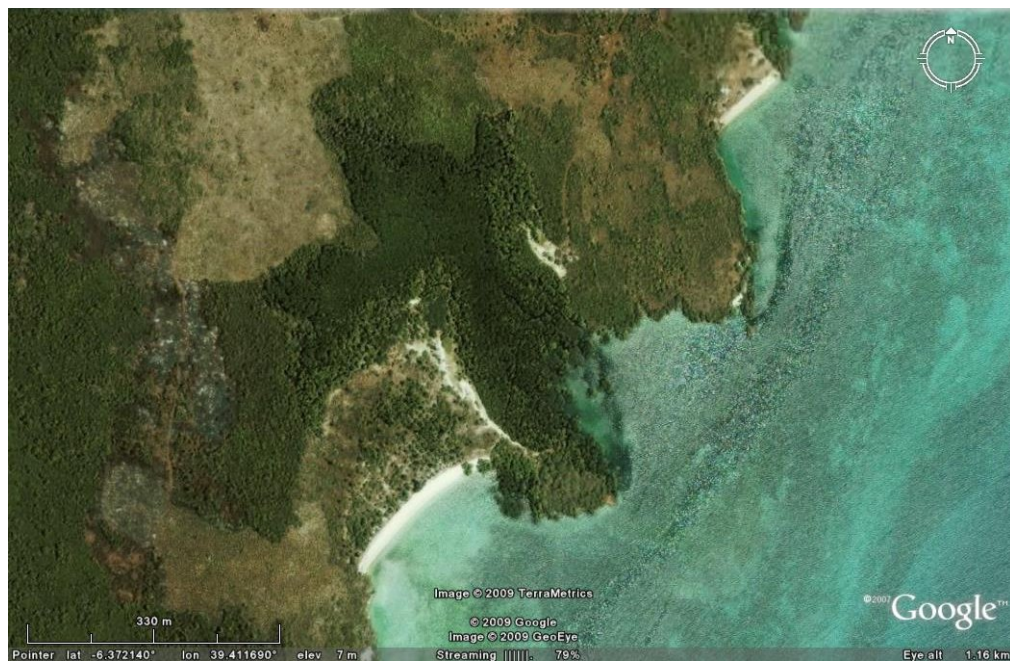
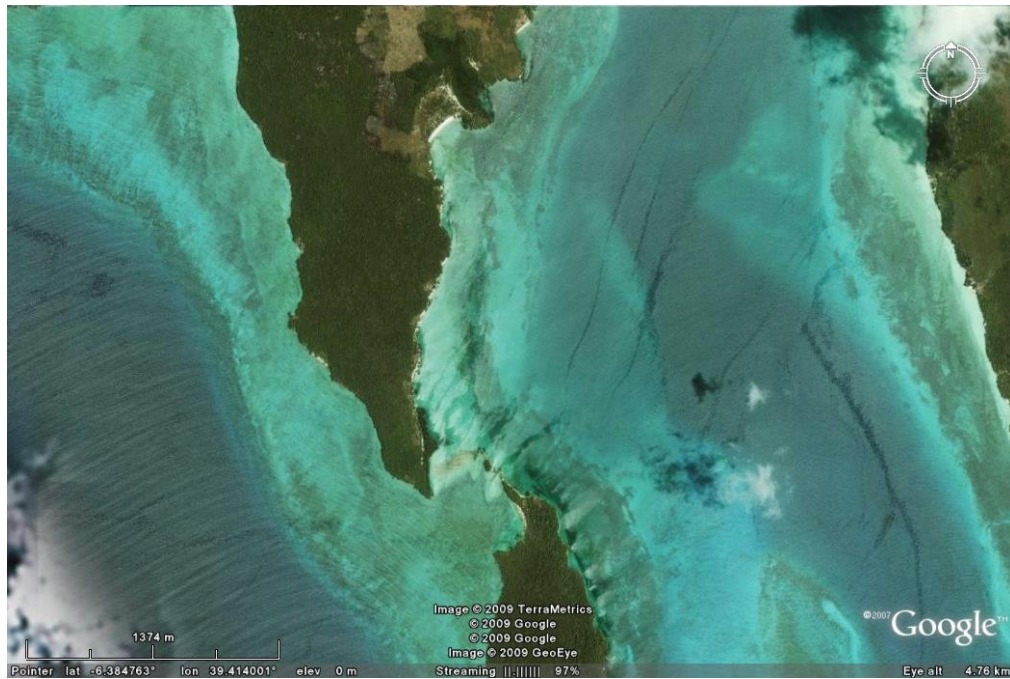
Outlines of core group ranges in Kichanga Dowe mangroves and extent of coral rag and scrub around mangroves in 2005 (Nowak, 2007).





### Appendix III

Google Earth images from (A) southern Uzi and northern Vundwe Islands and (B) Kichanga Dowe mangroves (from 2009). Note the extent of shamba surrounding the Kichanga Dowe mangroves.



## Survey Team

From top left: Said Fakhri, Andy Perkin, Trevor Jones, Katarzyna Nowak, and Mwinyi Khamis Mwinyi

