

Decades ago the lowland forests of Kimboza and Ruvu were linked by continuous tree cover along the River Ruvu Gorge but then the area was largely deforested for agriculture. In recent years the land has been so degraded that most of it is now abandoned. However,

much of the vegetation is regularly burnt as fires spread from farmed areas. Our objective is to restore the wooded corridor linking the two forests. We will carry out activities that preserve and enhance the unique biodiversity of Kimboza and Ruvu forests.



Early morning fog lingering over Kimboza Forest Reserve with the North Uluguru Ridge in the background. The whole countryside to the base of the mountain clouds has been deforested.

Kimboza Forest Reserve update

Kimboza is a forest island of 4 km² mostly surrounded by slash-and-burn farmland. Due to resource and financial constraints, limited management is taking place to preserve the integrity of the forest. In addition, the severe drought of 2021 further exacerbated the situation. As a result, once again, fires devastated large parts of the northern end of the reserve. 2020 had been a good year as money from Zoological Society for the Conservation of Species and Populations (ZGAP) was available to clear ground vegetation and litter from key areas of the forest boundary. During that year no fires encroached into the

forest. The key factor in preserving Kimboza is the yearly clearing of the forest boundary in all areas susceptible to be breached by fires spreading from slash-and-burn agriculture practiced in the farms surrounding the reserve. This means that sustained funding to annually clear at 25 km of the reserve's periphery is required to preserve the long-term integrity of the remaining stands and to reestablish tree cover in fire devastated areas. Seeking this funding is a key factor in the maintenance of this incredibly biodiverse forest. Dealing with the invasive *Cedrela odorata* is the other main management issue.

Litter

Since around 2010 discarded plastic bags had become a troublesome issue, and were subsequently banned by the government. This legislation dramatically reduced the amount of litter hanging off trees or lying on the ground but the number of plastic bottles has dramatically increased along the road bisecting the reserve since 2019. At present there are many

plastic bottles along the roadside, as these get discarded from passing buses.

Road traffic

The rise in litter has not just been the result in the affordability of take away soft drinks but also the consequence of a massive increase in road traffic. There has been a significant increase in the number of buses and lorries, carrying farm produce towards Morogoro.

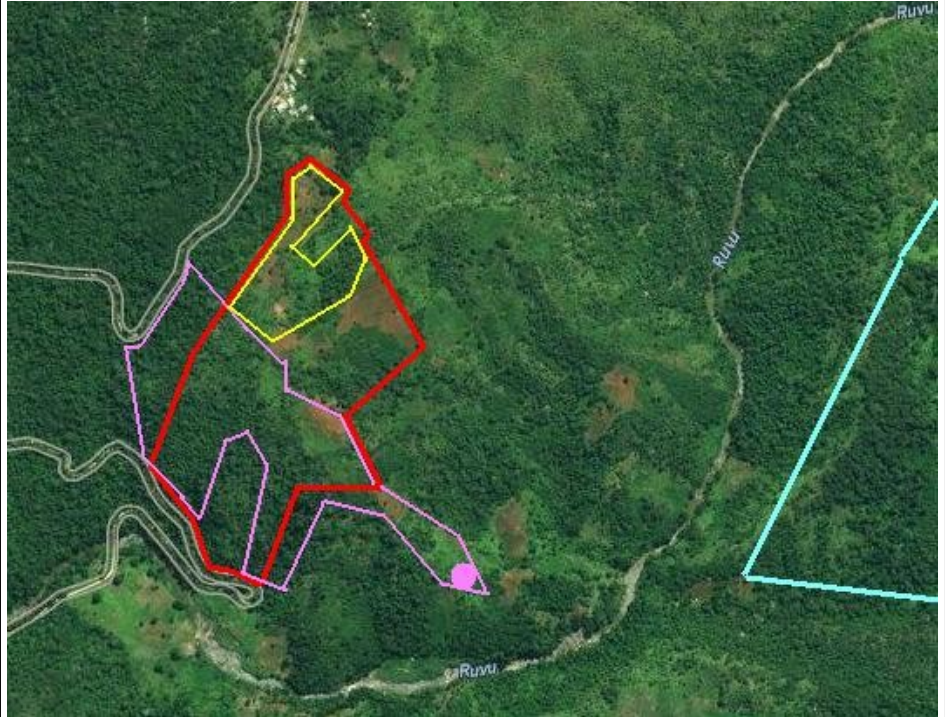
Illegal logging and pole harvesting

Over the past few years, thanks to the diligence of the forest guard, there has been a reduced amount of logging events, mostly the invasive *Cedrela odorata*, usually inside the forest inaccessible to the guard. In 2021 we found 12 new logging platforms, thus illegal logging remains a big issue. The gaps opened by illegal loggers are invaded and dominated by *Cedrela*. Pole cutting is currently not an issue.

Kimboza-Ruvu Gorge Conservation Area News

Forest Corridor – Progress in 2020-21

The proposed corridor aims to link the two nearby forest reserves of Kimboza and Ruvu. Land behind the mission extending over the Kibungo Hills has been acquired. It has a mixture of degraded vegetation and recently cultivated ground. It extends nearly all the way to the Ruvu River Gorge. Four years ago it came to our attention that a mobile phone provider had enquired about setting up a mast on the top of one of the Kibungo Hills. It was then clear that we had to secure the top of the hill overlooking Kimboza and the River Ruvu as soon as possible. We successfully achieved this key target. In 2021 the phone company returned to Kimboza but were basically told by the village chairman: 'sorry, too late, the hill is now a conservation area'.



Above: This aerial view shows the Ruvu River bisecting the landscape, the buildings at the top left are those of the catholic mission situated right next to the main road. The area that has been secured for conservation is outlined in red. Yellow shows the area that is now recovering well and is

forming a secondary forest. The 2021 fire affected the area delimited by a pink line and it originated from the pink spot at the base of the steep hillside. In blue, to the right, is an approximate demarcation of the Ruvu Forest Reserve.

Nature Conservation Area – the big set back as disaster struck

Towards the end of the 2021 drought Charles Kilawe was surveying a large plot near the top of one of the hills. This process includes all the neighbours so that the plot boundaries are clearly recognized and agreed by all stakeholder. In the process they noticed smoke arising from close to the river, about a km away from where they were standing. Not before long they had to swiftly evacuate as the cloud of smoke heading their way was becoming huge and the flames were racing up the steep hillside thanks to a dried-out landscape.



By evening the fire was consuming the hill tops and during the night, the prevailing winds pushed it all the way down the other side of the hills. Only once the fire reached the road and, surprisingly, a footpath did it stop spreading into the reserve.

The fire had a dramatic impact on about half of the land set aside for conservation. In most parts all undergrowth was killed. However, most canopy trees survived but for a few areas on very steep slopes where smaller trees were killed (see left). Provided fires can be kept at bay, the forest undergrowth should readily return.

Kimboza conservation work

The two main threats to Kimboza over the past couple of decades have been recurrent fires and the spread of invasive species, but in particular the neotropical tree *Cedrela odorata*. A garden ornamental, *Tradescantia*

zebrina, was recently observed to spread in a few locations and forming monotypic clumps under dense forest canopy. This herb needs to be eradicated before it becomes un-manageable.

***Tradescantia zebrina* control**

A group of local school girls spent an afternoon learning about forest ecology and conservation. They then took action and cleared a patch of *Tradescantia zebrina*, an introduced garden ornamental, that is slowly but steadily spreading on the forest floor. It is at the stage that it can still be eradicated as it currently covers a dozen small areas.



***Cedrela odorata* control**

In 2021, 140 students from Sokoine University of Agriculture in Morogoro were brought to Kimboza for 4 days. As part of their Forest Restoration course they carried out the control of *Cedrela* over an area of around 40 ha. A patch of forest in a good state, that is with no or

sparse canopy of *Cedrela* was chosen. The students pulled every seedling and sapling they encountered as they walked in line across the forest. The scheme was funded by the Zoological Society for the Conservation of Species and Populations, and should continue in 2022.

Forest boundary management

In order to prevent fires spreading from the adjacent farmland a paid team of 6 locals was employed to clear vegetation and litter from a substantial length of the reserve boundary. This involves removing leaf litter and shrubby vegetation on a 6 m wide strip at the forest's edge which is demarcated by planted teak trees. This was carried out prior to the fire season in June 2021. Unfortunately, the extent of the grant money covered only the clearing of sections of the forest boundary with a history of recurrent fires. Furthermore, no clearing was carried out during the late dry (September-November) season when it was the most necessary as a result of the drought.



Bilal Omari Muhulo, a leader of forest surveillance team, was given a smart phone but had to walk a 10 km return trip to charge it. Here, he has just been given power pack to make life easier, with fewer journeys to the nearest power supply.

Kimboza-Ruvu Region Research News

Kimboza discoveries

Over the past two years individuals from the *Drypetes* and *Cola* genera, that are taxonomically difficult and thought to be as yet undescribed species, have been monitored. In

addition fertile voucher specimens have been collected to be sent to Kew for specialist assessment, with duplicates lodged at the Dar es Salaam Herbarium.



An unusual looking fern, *Actiniopteris radiata*, was recorded for the first time in the Kimboza-Ruvu region. It was growing on a steep rock incline that adjoins part of the the River Ruvu at the start of the gorge. This fern can grow to 20cm tall and has a distinct radiating arrangement of its fronds (ca 5 cm across).



Cola quentinii Cheek (Sterculiaceae) was first described in 2007 (male flower above) but without the description of the fruit as it had never been observed. After a photo was taken in 2017, the first ever collection has now been made.



During our regular walks through the forest we occasionally come across novelties. At the base of a cliff in our newly established conservation area we found *Hydnora abyssinica* under a patch of very heavily disturbed forest. This underground parasitic plant is widespread in Africa, yet it is rarely seen as it is only observable when it flowers (flower 20 cm tall). The first species record in the region.

Background information - Kimboza-Ruvu Region

The Kimboza-Ruvu region lies at the base of the Uluguru Mountains that are part of the Eastern Arc Mountains in Eastern Tanzania. It lies 60 km from Morogoro on the main road to the Selous Game Reserve. The area is inhabited by the Waluguru people.

The Kimboza and Ruvu Forest Reserves are managed by the Tanzania Forest Service Agency (TFS) based in Morogoro. In 2019 the TFS produced a management plan for Kimboza Forest.

The Kimboza-Ruvu Gorge project is managed by Dr Charles J. Kilawe from Sokoine University of Agriculture in collaboration with Pierre Binggeli, the local communities and TSF.
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Right: Location of the forests reserves in the Morogoro Region with A. Kimboza, B. Ruvu

