

The Chakwenga Headwaters and the Nyabutaye Peat Bog

By Mike Bingham, December 2014

Before Zambia went decimal the 80-mile milestone on the Great East Road marked a feature which nature enthusiasts coined the 80-Mile Dambo. A gorge cut into the hill range on the north side of the road drains into a peat bog which is the source of the Nyabutaye (Nyautai on the Survey Department maps), a short tributary of the Chakwenga, which has its source about 1 km to the west.

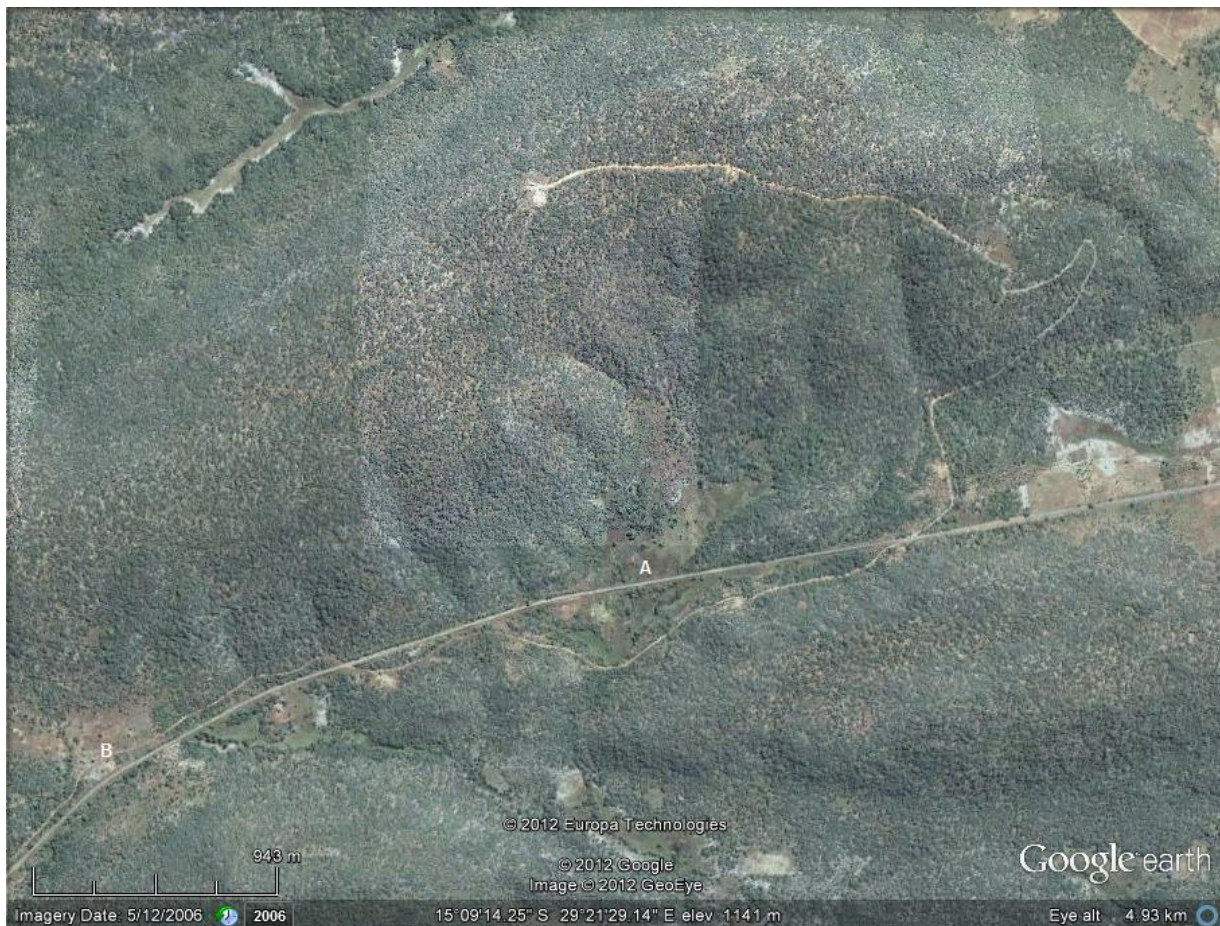


Figure 1 – The Chakwenga Headwaters. The Chakwenga arises in the dambo at the bottom left of the photograph (B), and flows eastward before turning south towards its confluence with the Zambezi. A winding track leads to transmitting towers at the crest of the hill. The Nyabutaye (A) is a short tributary of the Chakwenga.

From the road the dambo can be recognized by the clumps of raffia palms (*Raphia farinifera*) with their enormous leaves reaching up into the sky. The peat bog is flanked by streams on the west and east sides. During most of the year much of the area between these streams is awash,

the water flowing as a sheet over the surface. The peat is a little more than a meter deep in the deeper parts. A block of gallery forest, with evergreen species, *Syzygium cordatum*, *Vitex doniana* and *Gardenia imperialis*, occupies the upper part of the western stream.



Figure 2 – The Nyabutaye Dambo. The former alignment of the Great East Road crossed the Nyabutaye at its outlet from the dambo (at the 1070m altitude marker). The current alignment cuts the dambo roughly in half. The peat bog occupies most of the open terrain to the north of the road, and is flanked by two semi-permanent streams.

Flora

Edward Robinson, who was employed as a teacher and later as an inspector of schools from 1952-1966, was a prolific botanical collector who made a comprehensive collection of the flora of the Chakwenga Headwaters on numerous visits between August 1963 and March 1965. Robinson focused on the herbaceous component, omitting the better known woody flora, but he collected in the woodlands as well as in the wetlands. His collections from the Chakwenga Headwaters are summarized in Table 1.

Other notable collectors include Arne Strid, 1972; Graham Williamson, author of *The Orchids of South Central Africa*, J.M. Dent & Sons, 1977; and Jan Kornaś, a fern specialist.

Table 1 – Summary of numbers of species collected from the Chakwenga Headwaters by Edward Robinson

Group		Families	species
Ferns		5	6
Dicots		47	218
	Legumes Papilionoideae		38
	Acanthaceae		16
	Lamiaceae		12
	Asteraceae		29
Monocots		11	165
	Cyperaceae (sedges)		56
	Poaceae (grasses)		52
	Orchidaceae		34
Totals		63	389

It would be wrong to get the impression that Robinson's collections were exhaustive. Two of the most common grasses, the common reed, *Phragmites mauritianus*, and *Imperata cylindrica*, were not collected, as they are common and widespread and readily identifiable. Six specimens are simply named by the family Asclepiadaceae (now family Apocynaceae subfamily Asclepiadoideae) no doubt as Robinson had failed to find anyone who could name them.

When we first arrived in Zambia in 1966 there was an active natural history society which held regular Sunday outings, and the 80-Mile Dambo was a popular destination. The area was almost uninhabited, the only structures were the tsetse fly barrier and the tsetse control station. After the road was tarred, a few settlers began to arrive. In the 1970s a settler tried to grow bananas and sugarcane to sell to the passing trucks. He dug deep ditches to drain the peat, but soon gave up. The ditches are still there and so is the peat. *Imperata* is a prominent invader of the tilled area, but so is the tree *Syzygium cordatum*. It seemed at one time that the latter would mature into a forest, but frequent fires burn them back. Even two or three of the orchids have returned.

Anyone with little knowledge of crop growing may be excused for supposing that the rich vegetation and the black peaty soil would yield food in abundance. Today there is another would be emergent farmer who has failed to learn the lesson from his predecessors. He has cleared part of the forest, dug deep ditches and planted maize on their banks. There is an orchard of the local village banana, but he does not have access to the required inputs. The logs

from the cut trees are stacked for burning – the wood is unsuitable for making charcoal by the traditional method. Had this man spared his energy he could at least have devoted more time to constructing a better compound. He will not reap a crop and will inevitably be forced to move, leaving the dambo to repair itself, until the next hopeful settler tries his luck.

Threats

In the 1970s few people visited the dambo, as it was remote from habitation and had little to offer. The rise in popularity over the past two decades, of chikanda, a delicacy made from the tubers of terrestrial orchids, now has people coming to harvest tubers every year. As far as I am aware the only chikanda species collected at Nyabutaye is *Disa hircicornis*, but in spite of regular harvesting, the species appears to be holding its own. Trampling by many feet compacts the peat, changing its structure and permeability, favouring creeping grasses. If cattle were to be grazed the vegetation would be transformed, with the loss of most of the biodiversity. Fortunately the undisturbed vegetation is extremely unpalatable, but if ever the area is heavily stocked with livestock the habitat will certainly be lost.

Peat bogs occur in dambos throughout much of the Zambian plateaus, though few match the biodiversity of Nyabutaye. Occasionally the deeper layers may dry out and then can catch alight, and a smoldering burn then reduces the peat to ash, exposing the underlying sand.. The combustion is slow and relentless, often surviving rainy seasons, the rainwater wetting only the surface before flowing away. During a severe drought, farmers who grew rice in Kalahari sand pans near Mongu found that when they burned their crop residues in December, in preparation for planting, the peat caught fire and was destroyed, leaving soil which could no longer produce a crop (McFarlane, 1995).

Judging by the depth of the peat, and the high diversity of plants specifically adapted to this habitat, we can be sure that the Nyabutaye peat bog dates back many centuries. A combination of the deforestation of the catchment area, and exposure of the peat through tillage and late fires, may see a gradual decline followed by a peat burn during a severe drought. I hope we are not too late to stop it happening.

References and further reading

M.G. Bingham, 2002. Edward Robinson's contribution to Zambian botany. *Kirkia* Vol. 18, Part 1, 11-15.

M.G. Bingham, 2007. The Raffia Palm, *Black Lechwe* Vol. 15, No. 2

M.J. McFarlane, 1995. Pans and dambos of Western Province, Zambia. - A preliminary consideration of their geomorphology /hydrology. Report on a backstopping mission to the Land and Water Management Project, Dept. of Agriculture, Mongu, Zambia.

G. Williamson, *The Orchids of South Central Africa*, J.M. Dent & Sons, 1977



Figure 3 – The peat bog a month after a burn. 20Oct2012



Figure 4 – Scorched *Syzygium cordatum*, the grass *Imperata cylindrica* (white) and the fern *Thelypteris confluens*.



Figure 5 – Forest clearing. The soft wood of the forest tree is unsuitable for making charcoal by the tradition method – these logs will simply be burned.



Figure 6 – The water is clear and stained brown by tannin secreted by the vegetation. Such 'black water' is sterile, almost devoid of nutrients and animal life.



Figure 7 – *Disa hircicornis*, a chikanda species. Kalungwishi Ranch, January 2000