CHAPTER 2

STUDY AREA

The Tembe Elephant Park is situated in Maputaland, northern KwaZulu-Natal, South Africa. Its northern boundary is the border between South Africa and Mozambique, while the southernmost boundary is the tar road that leads from Ingwavuma to the rural town of KwaNgwanase, approximately 40 km east of the Tembe Elephant Park. The Tembe Elephant Park comprises some 30 013 ha of Sub-humid Lowveld Bushveld (Low & Rebelo 1996). Moll and White (1978 in: Matthews *et al.* 2001) divided the vegetation into more discrete units, namely, the Pallid Sand Bushveld, Sand Forest, Palmveld, Grassland and the Muzi Swamp. A more detailed description of the vegetation of the Tembe Elephant Park can be found in Matthews *et al*. (2001).

The Muzi Swamp

The Muzi Swamp is one of the larger emergent, palustrine, flat wetlands in southern Africa, stretching northwards from just south of the Tembe Elephant Park all the way into the southern part of Maputo Bay in Mozambique where it flows as the *Rio Futi* into the Indian Ocean. According to the classification system of Dini and Cowan (2000), the Muzi Swamp is a palustrine system by virtue of the fact that it has a greater than 30 percent cover of trees, shrubs, emergent macrophytes, mosses or lichens. It is further classified into a flat subsystem on the basis that it exists on comparatively level land with little or no relief.

The Muzi Swamp is situated in the eastern portion of Tembe Elephant Park. It forms a polygon between the following coordinates: 26º 53’ 08’’ S and 32º 34’ 58’’ E, 26º 53’ 04’’ S and 32º 34’ 59’’ E, 27º 01’ 25’’ S and 32º 29’ 54’’ E and 27º 01’ 24’’ S and 32º 29’ 44’’ E. The Muzi Swamp extends northwards from the KwaMsomi Gate in the south to the Muzi Gate in the north, from where it continues into Mozambique. Most

of the South African portion of the Muzi Swamp is situated in the Tembe Elephant Park (Grundling 1999). A small portion of the Muzi Swamp is situated in the Sibonisweni community's land adjacent to the Tembe Elephant Park to the southeast. The section of the Muzi Swamp that lies within Tembe Elephant Park is approximately 560 ha in size (Grundling 1999). It is estimated that the Muzi Swamp in the Tembe Elephant Park is from 200 to 500 m wide and approximately 17 km long. It lies on Holocene peat deposits that were formed as a result of the topography of the underlying Pleistocene KwaBonambi coastal dunes (Grundling 1996). The Muzi Swamp is an elongated north-south running interdune valley that is orientated parallel to the present coastline (Matthews *et al*. 2001). Peat deposits of up to 5 m thick have accumulated in the interdune valley of the permanent Muzi Swamp. This interdune peatland and isolated wetland are fed by groundwater from perched aquifers within the sand dunes (Grundling 1999).

Soils

The movement of ground water towards the Muzi Swamp has lead to the formation of clay-rich, slightly saline or calcareous duplex soils in the low-lying areas of the Muzi Swamp (Matthews *et al.* 2001). Narrow bands of soil with a relatively low soluble salt content and a high exchangeable sodium content around the Muzi Swamp are fairly common (Matthews *et al*. 2001). The Muzi system is characterised by soils that have experienced prolonged saturation with water and have thus undergone intense reduction. These organic-rich histosols (Champagne form) (Matthews *et al*. 2001) contain large amounts of slowly decaying plant material due to the lack of oxygen in the soil. Histosols are essentially repositories for atmospheric carbon that has been fixed by plants during photosynthesis, and as such will tend to expand and accumulate over time. The peat accumulation in the Muzi Swamp occurs at a rate of 1.2 mm per year (Grundling 1999) and it is a result of the partial disintegration and

decomposition of plant material under conditions of inundation (Soil Classification Working Group 1991). Grundling's (1999) study, however, showed that the peat profiles of the southern sections of the Muzi Swamp were substantially more arid than those in the northern parts of the swamp. The peat profile, and more specifically the rate of accumulation of the peat layers, illustrate that the southern sections of the Muzi Swamp are also historically drier than the northern sections.

Climate

According to Schultze (1982 in: Matthews *et al*. 2001) the climate of Tembe Elephant Park can be described as warm to hot, humid and subtropical with the winters being drier than the summers. Rainfall can, however, occur throughout the year. Climatological data were collected form the Sihangwana weather station (27º 02' 35'' S and 32º 25' 25'' E) close to the study area and accurately reflects the prevailing climatological conditions. The mean annual rainfall is 721.5 mm. This is high relative to the annual precipitation over most of the rest of South Africa, leading to large amounts of perennial water. The minimum recorded annual rainfall is 245.0 mm, while the maximum is 2105.0 mm. The temperature in Tembe Elephant Park ranges from a minimum of 4.0º C to a maximum of 45.0º C. The proximity of Tembe Elephant Park to the coast along with its low-lying topography result in a high atmospheric humidity (KwaZulu-Natal Nature Conservation Service, Unpublished Report). Graphical climate data are first illustrated in Chapter 4 of this dissertation.

The Sibonisweni community

The Sibonisweni community comprises some 170 households and is one of the most populous communities neighbouring the Tembe Elephant Park, with over 1000 people residing there. The boundaries of the communal land begin on the southeast corner of the Tembe Elephant Park and continue southwards to the tar road that leads to KwaNgwanase. The people of the Sibonisweni Community reside on

communal land under the governance of the Tembe Tribal Authority (URL: http://www.up.ac.za/academic/centre-environmental-studies/Asard/A-SARD-UP). People in this and other communities like it in the area practise a subsistence agriculture, and produce arts and crafts for sale to tourists. They also have jobs that are related to tourism in the neighbouring Tembe Elephant Park. The Tembe Elephant Park also provides occasional job opportunities when casual labour is needed for tasks such as routine fence and road maintenance and invasive plant control. Many families in the Sibonisweni community are also reliant on the allocation of harvesting permits for the gathering of reeds in the Tembe Elephant Park. Families that are allocated these permits benefit financially from the commercial sale of the harvested reeds.

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