



Fig. 74. Landscape 32. Nwambia Sandveld, Shirombe pan.



Fig. 75. Landscape 33. *Pterocarpus rotundifolius/Combretum collinum* Woodland.

The field layer of this landscape is dense with definite differentiating species. Such species are: *Setaria holstii*, *Urochloa brachyura* and *Oxalis latifolia*. Other grass species that are usually present are: *Themeda triandra*, *Digitaria eriantha* var. *pentzii*, *Panicum coloratum*, *Cymbopogon plurinodis*, *Brachiaria nigropedata*, *Panicum maximum*, *Aristida congesta* subsp. *barbicollis*, *Rhynchelytrum repens*, *Heteropogon contortus*, *Urochloa mosambicensis*, *Cenchrus ciliaris* and *Eragrostis rigidior*. Forbs occurring are the following: *Cassia mimosoides*, *Vernonia fastigiata*, *Indigofera rhytidocarpa*, *I. vicioides*, *Kohautia virgata*, *Corchorus asplenifolius*, *Ipomoea obscura*, *Hermannia glandiligera*, *Rhynchosia minima*, *Aspilia mossambicensis*, *Jatropha zeyheri*, *Striga asiatica* and *Crabbea velutina*.

An example of the vegetation composition on one of the koppies is as follows:

Woody species	Herbaceous species
<i>Combretum apiculatum</i>	<i>Panicum maximum</i>
<i>Acacia nigrescens</i>	<i>Andropogon gayanus</i>
<i>Elephantorrhiza burkei</i>	<i>Urochloa mosambicensis</i>
<i>Grewia monticola</i>	<i>Heteropogon contortus</i>
<i>Pterocarpus rotundifolius</i>	<i>Urochloa brachyura</i>
<i>Cissus cornifolia</i>	<i>Brachiaria xantholeuca</i>
<i>Ozoroa engleri</i>	<i>Digitaria eriantha</i> var. <i>pentzii</i>
<i>Combretum collinum</i>	<i>Hermannia glandiligera</i>
<i>Combretum hereroense</i>	<i>Stylosanthus fruticosa</i>
<i>Maytenus heterophylla</i>	<i>Jasminum stenolobum</i>
<i>Bauhinia kirkii</i>	<i>Vigna triloba</i>
<i>Dombeya rotundifolia</i>	<i>Cucumis africanus</i>
<i>Lantana rugosa</i>	<i>Asparagus plumosus</i>
<i>Diplorhynchus condylocarpon</i>	<i>Dyschoriste rogersii</i>
	<i>Vernonia fastigiata</i>
	<i>Solanum panduraeforme</i>
	<i>Ipomoea obscura</i>
	<i>Aspilia mossambicensis</i>
	<i>Tragia dioica</i>
	<i>Commelina bengalensis</i>

#### Fauna

This landscape is apparently ideal habitat for roan antelope, because a herd occurs in every sub-unit. Zebra, sable, eland, kudu, impala, and buffalo are generally present but only elephant bulls stay in the vicinity. The largest "tusker" in the world, an elephant bull known as Mafunyane, was also regularly seen in this area. Tsessebe are often observed in this landscape. Smaller antelope such as steenbok and Sharpe's grysbok are well represented.

#### 34. Punda Maria Sandveld on Waterberg Sandstone

##### Location and Geomorphology

Sandstone of the Waterberg System occurs extensively in the north-western portion of the KNP around Punda Maria. It is a dissected landscape with mountains and

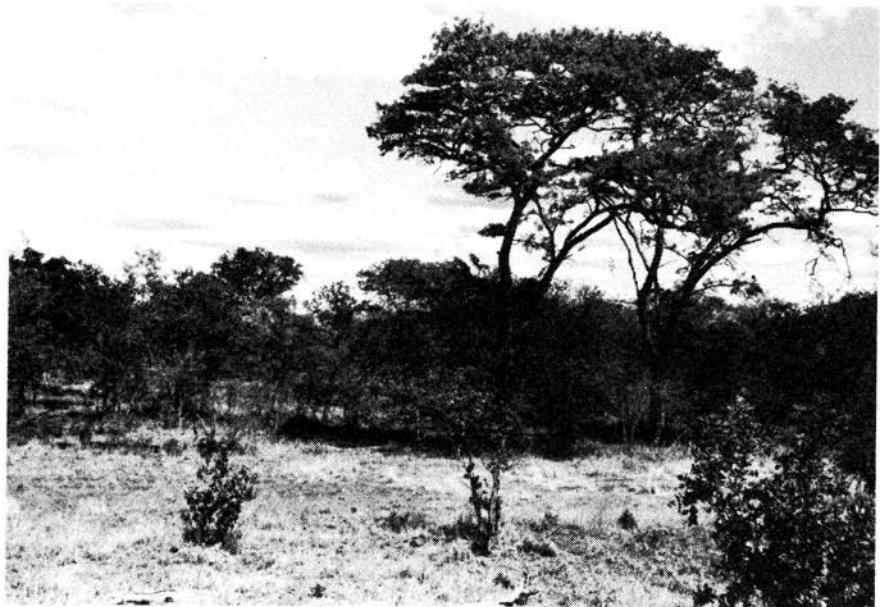


Fig. 76. Landscape 34. Punda Maria Sandveld on Waterberg Sandstone. *Burkea africana* tree savanna.

plains that accommodate a variety of habitats. The area is drained by tributaries of the Levubu River such as Shidzivane, Mangovane, Matukwala and Shipudza. Mountains are relatively common and the following are the most conspicuous Gumbandevu, Shitshowa, Dongadziva, Thulamila and Mikambeni. Springs are common in this landscape and a few of them are reasonably permanent such as Shipudza, Shipale, Shilalani and the warm water spring at Tshalungwa. These springs are a unique characteristic of this landscape.

Diabase sills and dykes intruded into the Waterberg System, similar to dolerite. These intrusions have a big influence on the type of soil that originates and the vegetation that occurs. The area is relatively high lying and varies greatly in altitude as a result of the mountains. The altitude varies between 420 and 580 metres. The landscape covers 297 km<sup>2</sup> or 1,7 percent of the area of the KNP.

#### Climate

The Punda Maria environment has a moderate climate with an annual rainfall of ± 600 mm. The temperature is never as high as in the lower lying areas and as an example the temperature data for Punda Maria (Table 7) is applicable to this area. As a result of the great differences in altitude, slope and aspect there is a great variation in habitat especially as far as the micro-climate is concerned.

#### Soil Pattern

The soils in this landscape vary from lithosols in the mountains to deep sandy soils on the middleslopes and brackish soils in the bottomlands. Dominant soil Forms on the mountains are Mispah and Glenrosa, while Hutton, Clovelly and Glenrosa

dominate the middle-slopes. The bottomlands are dominated by soil Forms such as Valsrivier, Hutton, Swartland and Sterkspruit. Where diabase intrusions and sills occur the soils are more clayey and the following soil Forms can be expected: Shortlands, Hutton, Bonheim and Swartland.

### Vegetation

The vegetation of this landscape as described by Van Rooyen (1978) is divided into the following communities:

- i) The *Burkea africana/Pseudolachnostylis maprouneifolia*-tree savanna.
- ii) The *Kirkia acuminata/Afzelia quanzensis/Combretum apiculatum*-tree savanna.
- iii) The *Androstachys johnsonii/Croton pseudopulchellus*-dry woodland.
- iv) The Diabase Community.

The *Burkea africana/Pseudolachnostylis maprouneifolia*-tree savanna (Fig. 76) occurs on deep sand to loam soils of the Hutton and Clovelly Forms. It is a tree savanna and Van Rooyen (1978) describes the structure in the following table.

Stratum	Percentage Crown Distribution
>6 metres	2
4.5 metres	5
3 metres	11
2 metres	14
1 metres	13
0.5 metre	10

Dominant woody species are: *Burkea africana*, *Pteleopsis myrtifolia*, *Pseudolachnostylis maprouneifolia*, *Hymenocardia ulmoides*, *Bauhinia galpinii*, *Diplorhynchus condylocarpon*, *Ochna pulchra*, *Holarrhena pubescens*, *Terminalia sericea*, *Guibourtia conjugata*, *Combretum collinum*, *Peltophorum africanum*, *Monodora junodii*, *Combretum zeyheri*, *Strychnos madagascariensis*, *Combretum apiculatum*, *Hexalobus monopetalus* and *Dalbergia melanoxylon*.

This community is also the home for a few rare species such as: *Acacia polyacantha* subsp. *campylacantha*, *Xylopia odoratissima*, *Crossopteryx febrifuga*, *Drypetes gerrardii*, *Pterocarpus angolensis*, *Heteropyxis natalensis*, *Turraea nilotica*, *Tylosema fassoglense*, *Combretum molle*, *Markhamia acuminata*, *Securidaca longipedunculata* and *Albizia versicolor*.

The field layer is moderate to dense and is characterised by the presence of the following species: *Andropogon gayanus*, *Digitaria eriantha* var. *pentzii*, *Panicum maximum*, *Fimbristylis hispidula*, *Pogonarthria squarrosa*, *Aristida argentea*, *Merremia tridentata*, *Agathisanthemum bojeri*, *Vernonia fastigiata*, *Hermannia glanduligera*, *Tricholaena monachne*, *Rhynchosia totta*, *Perotis patens*, *Brachiaria nigropedata*, *Eragrostis pallens* and *Vigna unguiculata*.

The *Kirkia acuminata/Afzelia quanzensis/Combretum apiculatum*-tree savanna (Fig. 77) occurs mainly on steep slopes with stony soils. It is a moderate tree savanna and the following species are common: *Kirkia acuminata*, *Afzelia quanzensis*, *Croton*



Fig. 77. Landscape 34. Punda Maria Sandveld on Waterberg Sandstone. *Kirkia acuminata* tree savanna.

*gratissimus*, *Guibourtia conjugata*, *Combretum apiculatum*, *Hymenocardia ulmoides*, *Diplorhynchus condylocarpon*, *Monodora junodii*, *Hexalobus monopetalus*, *Combretum zeyheri*, *Strychnos madagascariensis*, *Rhoicissus revoilii*, *Bridelia mollis*, *Phyllanthus reticulatus*, *Alchornea laxiflora*, *Maytenus mossambicensis*, *Artobotrys brachypetalus*, *Tricalysia allenii* and *Tephrosia sericea*. Rare species that occur mainly in this community are: *Gyrocarpus americanus*, *Warburgia salutaris*, *Wrightia natalensis*, *Albizia tanganyicensis*, *Schrebera argyrotricha*, *Entandrophragma caudatum*, *Brachylaena huillensis*, *Elephantorrhiza burkei*, *Rhus leptodictya*, *Lagynias dryadum*, *Landolphia kirkii* and *Canthium huillense*.

The following plants are present in the bush ravines on the mountains of this landscape: *Cussonia spicata*, *Cordia grandicalyx*, *Ficus sansibarica*, *Rhus gueinzii*, *Urera tenax*, *Landolphia kirkii*, *Schotia brachypetala*, *Vepris reflexa*, *Erythrina lysistemon*, *Bridelia mollis*, *Pouzolzia hypoleuca*, *Bauhinia galpinii*, *Tecomaria capensis*, *Albizia versicolor*, *Cassine aethiopica*, *Schrebera alata*, *Strychnos usambarensis*, *Brachylaena huillensis*, *Acacia ataxacantha* and *Heteropyxis natalensis*.

The field layer of the *Kirkia acuminata/Afzelia quanzensis/Combretum apiculatum* tree savanna have a low crown cover, with the following dominant grass species: *Digitaria eriantha* var. *pentzii*, *Panicum maximum*, *P. deustum* and *Pogonarthria squarrosa*. Commonly occurring forbs are *Pellaea viridis*, *P. calomelanos*, *Euphorbia polycnemoides*, *Cyphocarpa angustifolia*, *Asparagus falcatus*, *Indigofera lapatana*, *Achyranthes sicula*, *Triumfetta pentandra* and *Crabbea velutina*.

The *Androstachys johnsonii/Croton pseudopulchellus*-dry woodland occurs on the

drier slopes of the mountains and the composition of this woodland has already been discussed under Landscape 31. The same applies to the *Colophospermum mopane/Euclea divinorum/Enteropogon macrostachyus* high tree savanna that occurs on the brackish soils of the bottomlands of the landscape and this has been discussed in detail under Landscape 15.

The soils of the diabase intrusions and sills are more clayey and a unique community occurs. It is a shrub savanna with the following important woody species: *Combretum hereroense*, *Acacia nigrescens*, *Dichrostachys cinerea* subsp. *africana*, *Pterocarpus rotundifolius*, *Combretum collinum* subsp. *suluense*, *Lonchocarpus capassa*, *Combretum imberbe*, *Acacia gerrardii*, *Cassia petersiana*, *Grewia hexamita*, *Bolusanthus speciosus*, *Ormocarpum trichocarpum*, *Piliostigma thonningii*, *Combretum mossambicense* and *Dombeya rotundifolia*.

The field layer is dense and grasses such as *Setaria holstii*, *Hyparrhenia rufa*, *Cymbopogon excavatus*, *Themeda triandra*, *Setaria sphacelata*, *Urochloa mosambicensis* and *Panicum maximum* are present. Dominant forbs are *Helichrysum miconiifolium*, *Ipomoea papilio*, *Hypoxis rooperi*, *Desmodium lasiocarpum*, *Leonotis nepetifolia*, *Thesium resedoides*, *Corchorus trilocularis*, *Acalypha petiolaris* and *Vernonia oligocephala*. From this list of plants it can be concluded that the diabase community is very similar to the vegetation of Landscape 33.

The Levubu River forms the western boundary of the landscape. The riverine vegetation and that found on the banks of the larger spruits and around springs concurs with the description by Van Rooyen (1978) viz. the *Acacia albida/Ficus sycomorus*-river woodland which was discussed in detail under Landscape 28.

#### Fauna

This landscape accommodates a low density of larger mammals. Game species present are bushpig, bushbuck, kudu, nyala and grey duiker. Herds of buffalo are regularly encountered and elephant are present but in small numbers. Due to the low density of prey species, lion and other carnivores are scarce.

### 35. *Salvadora angustifolia* Floodplains

#### Location and Geomorphology

This landscape occurs along the lower Shingwedzi, Bububu, Mphongolo and Phugwane Rivers. As a result of the alluvium deposited on the banks of the above-mentioned rivers over the years, floodplains have developed that are periodically under water. However, what is important is that the material from the surrounding area is carried to the rivers and deposited on the banks before reaching the actual stream. The floodplains are flat to slightly concave.

The landscape is situated between 240 and 300 meters a.s.l. and it covers 133 km<sup>2</sup> or 0,7 percent of the area of the KNP.

#### Climate

This area receives between 450 and 500 mm of rain per year. The long term average for Shingwedzi, which falls in this landscape is 472 mm per year. Due to the con-

cave topography, moisture is more available than what is indicated by the rainfall. Temperature data for Shingwedzi is given in Table 6.

#### Soil Pattern

As a result of the accumulation of salts in the alluvium, the soils of this landscape are usually brackish. Dominant soil Forms are Valsrivier, Sterkspruit and Oakleaf. White salt deposits are sometimes detectable on the surface of the soil.

#### Vegetation

The vegetation of this landscape is unique in the respect that it is the only river system along which it occurs. It is a high tree savanna with a well developed shrub layer (Fig. 78). The field layer is very sparse and in some parts completely absent. The woody component of this landscape is dominated by *Colophospermum mopane* trees and shrubs and *Salvadora angustifolia* shrubs of ± three metres high.

Other woody species which occur are *Adenium obesum*, *Euclea divinorum*, *Ximenia americana*, *Commiphora glandulosa*, *Thilachium africanum*, *Acacia tortilis*, *Grewia bicolor*, *Dichrostachys cinerea* subsp. *africana*, *Capparis tomentosa*, *Grewia monticola*, *Salvadora persica*, *Combretum mossambicense* and *Hyphaene natalensis*.

The field layer is weakly developed and bare patches frequently occur. Grass species which do occur are: *Urochloa mosambicensis*, *Panicum maximum*, *Sporobolus fimbriatus*, *Dactyloctenium aegyptium*, *Chloris virgata*, *Aristida congesta* subsp. *barbicollis*, *Tragus berteronianus*, *Chloris roxburghiana*, *Bothriochloa radicans*, *Schmidtia pappophoroides*, *Brachiaria xantholeuca*, *Enneapogon cenchroides*, *Oropetium capense* and *Chloris mossambicensis*.



Fig. 78. Landscape 35. *Salvadora angustifolia* Floodplains.

Forbs are very common in this community and the following are worth mentioning: *Commelinia bengalensis*, *Abutilon guineense*, *Ruellia patula*, *Cyathula crispa*, *Cyphocarpa angustifolia*, *Phyllanthus pentandrus*, *Portulaca kermessina*, *Hibiscus sidiformes*, *Neuracanthus africanus*, *Abutilon austro-africanum*, *Sansevieria hyachinthoides*, *Amaranthes thunbergii*, *Pharnaceum elongatum*, *Ocimum americanum*, *Pupalia lappacea*, *Justicia flava*, *Elytraria acaulis*, *Asparagus plumosus* and *Portulaca quadrifida*.

The banks of the rivers are overgrown with high trees of which *Diospyros mespiliformis*, *Colophospermum mopane*, *Croton megalobotrys*, *Lonchocarpus capassa* and *Xanthocercis zambesiaca* are the most important. The conspicuous absence of *Trichelia emetica* in the Shingwedzi/Mphongolo-complex deserves mentioning.

#### Fauna

This landscape is the home of large herds of impala and a browse-line is often perceptible in the vegetation as a result of the presence of this game species. Waterbuck, kudu, buffalo and elephant are commonly found and even roan antelope are seen from time to time, usually on route to water. Quite a few herds of wildebeest stay on the bare patches in this environment and zebras are generally present. Baboons and monkeys are to be found along the rivers and carnivores such as lions and leopards occur regularly. Steenbok, duiker and nyala are present, while hippo and crocodile occur frequently in the rivers.

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