

# REGION 5

## SOUTHERN AFRICA

Angola	Namibia
Botswana	South Africa
Lesotho	Swaziland
Malawi	Zambia
Mozambique	Zimbabwe

### Introduction

This region has a total area of 5 900 296 km<sup>2</sup> and comprises the ten countries which lie, at least in major part, to the south of the watershed separating the Zaire and Zambezi Basins. The watershed follows an irregular course across the southern part of the continent, wandering between the parallels 10° and 13°S, from the Huambo Mountains in Angola to the Nyika Mountains in Malawi. Physiographically the region consists of a high triangular plateau with an elevated rim. Internally the land dips gently away from the rim, to a lower lying interior, but externally it falls by stepped scarps, often very abruptly. The coastal plain, along both eastern and western sides of the plateau, is backed by these scarps. In the west and south this plain is narrow, less than 20 km wide in places, but it opens out towards the northeast and, in parts of Mozambique, reaches 130 km in width. The high rim of the plateau attains maximum elevations of 2620 m asl in Angola on the western side, and 3482 m asl in Lesotho on the eastern side.

### Climate

The climate of the region is primarily determined by the warm southward flowing Agulhas Current on the east coast, and the cold northward flowing Benguela Current on the west coast, and by the regular alternation of high (winter) and low (summer) pressure cells over the plateau. Precipitation is highly seasonal over most of the region. During winter, dry winds tend to blow offshore, away from the central plateau, which is then virtually rainless except for the extreme south.

Wet weather in the far southern interior occurs sporadically in winter. It is due to cold air from the Southern Ocean moving eastwards or northeastwards across the tip of the continent and temporarily displacing the high pressure cell. These 'cold fronts' seldom, if ever, reach farther north than South Africa, and manifest their greatest influence over the southern part of that country.

Along the west coast the prevailing winds are from the south. They blow parallel to the coast, almost throughout the year, and are cool and desiccating. Thus the west coast is extremely arid. The narrow band of the Namib Desert, between 80 -160 km wide, occupies the coastal strip for some 1700 km from Mocamedes in Angola to a position south of the Orange River mouth in South Africa. On this coast the sand desert reaches the sea

in places, and sand dunes approach 350 m in height. Some localities are perennially rainless, and over most of the area precipitation seldom exceeds 50 mm in more than two months of any one year.

Moisture laden winds blow onshore along the southeastern and eastern coasts in summer, leading to moderate levels of precipitation at the coast, and relatively high levels on the mountains which provide a continuous backdrop to the coastal plain. During summer the high eastern edge of the Drakensberg Escarpment in Lesotho is almost perpetually covered by cloud, and in parts of northern Natal and western Swaziland a summer mist belt forms on seaward facing scarp slopes above 1200 m. Precipitation in these areas exceeds 2000 mm locally and is possibly higher on the plateau rim in Lesotho. Thunderstorms are frequent along the full length of the great eastern escarpment, usually occurring on more than 100 days per summer season in parts of Natal and Swaziland. However, areas of great local aridity occur in the hinterland of the east coast. For example, the Tugela River has eroded a deep wide valley through the seaward slopes of the plateau in Natal, and while mean annual precipitation at the edges of the valley is in the vicinity of 1200 mm, some stations deep in the valley receive less than half of this. Similarly, parts of the lower Usutu Valley in Swaziland are very arid, and in such sites high levels of insolation and evapo-transpiration exacerbate the ecological impact of poor local rainfall.

In addition to the warm and humid southeasterly and northeasterly winds from the Indian Ocean, which primarily influence the eastern side of the region, moist air from the Zaire Basin moves south in summer, causing heavy precipitation on the mountainous Zaire-Zambezi watershed. Here, along the northern boundary of the region, mean annual rainfall may reach 1700 mm. Nevertheless, the influence of the Zaire airmass wanes quickly in passing southwards to lower ground, and the south of Zambia is consequently drier than the north.

Seasonal and regional extremes of temperature occur throughout the interior plateau. Daytime temperatures frequently exceed 40°C in the north in summer, while by contrast, frosts are common in the south in winter. Readings as low as -18°C have been recorded at the top of the Drakensberg Escarpment in Lesotho, and widespread frosts are common on the southern and central parts of the interior plateau. Mild frosts occur on the coastal slopes of the plateau, e.g. above the 400 m contour in Natal. In South Africa, snow frequently covers the peaks of the mountains in winter, and in some years briefly covers the higher parts of the plateau. Very rarely it reaches the southern Transvaal, and has been known to fall on the higher coastal slopes of Natal.

## **Drainage**

All the principal rivers of the region have their sources in the mountains of the high rim of the central plateau. Drainage is accomplished either by short steep streams which descend the scarp slopes directly to the sea, or by long streams which at first flow down the more gentle slopes to the interior of the plateau. Here, like the Okavango River, they may dissipate their waters in endorheic wetlands, or like the Zambezi and Orange Rivers, they may traverse deep gorges through the rim of the plateau. Both these latter rivers reach the sea on the side of the continent opposite to that on which they rise.

Coastal, or scarp, streams have small drainage basins compared to those of the rivers which cross the plateau, but this is not to say that all scarp streams are unimportant. For example, the Save River drains an area of 92 100 km<sup>2</sup> in Zimbabwe and Mozambique, and the Tugela River drains an area of 29 008 km<sup>2</sup> in South Africa. This latter drainage

basin is approximately the same size as Belgium and it is larger than some small African states. On the west coast, south of Benguela, all scarp streams are ephemeral, and even the Cunene River ceases to flow at the surface near its mouth in dry seasons. On the south and east coasts only the smallest streams cease to discharge to the sea during dry seasons, at which time their mouths become choked by sand-spits so that their lower reaches invariably form brackish lagoons filled by reeds and/or trees.

The principal drainage basins of the region, which include two of the largest in Africa, are those of the Cuanza and Cunene (Kunene) Rivers which flow into the Atlantic Ocean in Angola, the Cubango (Okavango) River which discharges internally into the Okavango Swamps in Botswana, the Orange River (1 020 000 km<sup>2</sup>) which reaches the Atlantic Ocean in South Africa, and the Limpopo and Zambezi (1 330 000 km<sup>2</sup>) Rivers which reach the Indian Ocean in Mozambique.

### **Wetlands**

Tidal wetlands have a sporadic distribution around the entire coast, but mangrove vegetation reaches a southern limit on the west coast at Benguela in Angola (12°35'S), and on the east coast, at the Nahoon River mouth (32°59'S) in South Africa. At latitudes higher than these, herbaceous saltmarsh vegetation prevails on sheltered intertidal mudflats. There are numerous small lagoons and estuaries on the east coast and, in northern Natal and Mozambique, lakes and swamps occur along rivers and intermittent streams crossing the coastal plain. Other wetlands occur in depressions between stranded coastal dunes, and at the seaward edges of the lowland plain immediately to landward of the active coastal dune system. Some small marshes and pans occur on ephemeral streams on the west coast. On the high rim of the plateau, seepage from extensive sponge bogs provides the headwaters for the rivers, and in an area where water resources are at a premium, these must be of prime concern in conservation policies. Small basin bogs, or dambos, are scattered on the wetter slopes of many northern catchments, e.g. in Zambia and Malawi, and vast swamps and floodplains occur along the Zambezi and its tributaries where these streams traverse the flatter northern parts of the interior plateau. Elsewhere, in the arid western and central parts of the plateau, seasonally flooded salt pans have a scattered distribution, and there are a few perennial endorheic lakes and ponds.

With the exception of the Cuanza and Cunene, all the principal river systems transgress national boundaries, as do some important wetlands. To set the national accounts in context, overviews of two important physiographic features of the region are given here. These are the Southeast African Coastal Plain and the Zambezi Basin, the latter encompassing parts of Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia and Zimbabwe.

### **The Southeast African Coastal Plain**

This sandy plain extends for some 2700 km up the southeastern coast of Africa, spanning 15° of latitude from Durban (29°53'S) in South Africa to Mossuril (14°55'S) in Mozambique. It exceeds 160 000 km<sup>2</sup> in area and reaches 130 km in width. It is flat and hot, and riddled with swamps, despite having a comparatively arid climate in southern Mozambique. Thus at Quegulele (24°07'S/32°37'E) for example, where the Limpopo River emerges onto the plain, mean annual rainfall is 500 mm, while mean class A pan evaporation is 1800 mm. At ChOkw6, some 20 kilometres nearer the sea, mean annual rainfall is close to 700 mm, but

evaporation is also higher at almost 2300 mm/yr. Along the sea the plain is bounded by an almost continuous line of richly forested dunes, rising at Maphelana (28°24'S) to over 180 m in height. The plain extends from the tropics southwards into a warm temperate zone providing a discontinuous series of very similar wetland habitats along its length. Numerous clines, of both plants and animals, occur here. Inland of the dune forest the predominant terrestrial vegetation of the plain is thornveld, or open thornveld in southern Mozambique and northern Natal, reflecting the aridity of those areas.

Enormous quantities of siliceous alluvium are brought down to the coast from the mountainous hinterland each year, and are then swept northwards up the coast by longshore drift. In places, e.g. north of the Tugela River mouth in Natal, the sand is coarse and the beaches and dunes steep. Here the dunes rise with remarkable abruptness from the coastal plain, but where finer sand predominates, e.g. in Inhambane, the dunes are lower and the beaches flatter. The coast has been tilting seawards along a monocline for millions of years, but lateral shifts of the hinge line have led to alternate phases of coastal emergence and submergence. As a consequence of the former process, lines of stranded dunes may be found on broader sections of the plain, and a series of terraces appears in many river valleys. The hinterland has been rising since the inception of the monocline and consequently scarp rivers have been in a state of constant rejuvenation and have produced unusually large valleys. It is the material from these valleys which now forms the coastal plain.

Storms of great intensity occur over the mountainous hinterland and plain, during some of which precipitation has been known to exceed 500 mm in 24 hours, and on at least one occasion to exceed 740 mm in 36 hours. Sheet flooding may then occur on the middle plain, leading to huge soil losses, while seaward parts of the plain may be inundated to depths of 10 m or more. Fresh alluvium, 4 m deep, may be deposited over large areas of the coastal plain as a consequence of a single flood, and local landform and drainage patterns may change dramatically; shallow lakes may disappear.

Mean annual rainfall is higher at the coast than it is on the plain, and decreases progressively and quite sharply with increasing distance from the sea. It is for example, about 1000 mm at Sodwana Bay (27°30'S), but barely 600 mm at the western edge of the plain some 40 km inland. However, rainfall rises again on the series of scarps and interspersed plateaux which lead upwards to the rim of the central plateau. In passing northwards along the coast mean annual rainfall is about 1250 mm at Durban, decreasing to 1000 mm or less in northern Natal and southern Mozambique. It falls to some 800 mm at the Limpopo River mouth, but thereafter increases through Inhambane, to 1300 mm at Beira and to 1400 mm on the Zambezi Delta. Locally, in northern Mozambique, it may reach 1500 mm. Precipitation is highly seasonal throughout the plain and varies considerably from one year to the next. In a normal year the five months from May to September, at least, are virtually rainless. Severe droughts, lasting for several years, are not uncommon.

The entire east coast is strongly influenced by the Mozambique (Agulhas) Current which flows southwards at the edge of the continental shelf. Core temperatures in this stream reach 26°C and it lies close inshore in southern Mozambique and northern Natal. At Sodwana Bay (27°30'S) it is scarcely 3 km from the beach. The current flows most strongly in the immediate vicinity of its convergence with the continental shelf and the cooler inshore water, reaching surface velocities of 5 knots when northeast winds are behind it. Eddies are generated at the boundary with the cooler water over the continental shelf, and these cause tongues of warm surface water to circle landwards where they are deflected northwards alongshore. In consequence, in summer, inshore waters are maintained at temperatures

exceeding 21°C as far south as Port Elizabeth (33°58'S). The great latitudinal extension of mangroves on this coast, compared to the west coast, is due to the Agulhas Current. This produces both warm coastal water, and an abundance of alluvium as a consequence of the cooling of warm moist air over the mountainous hinterland.

The prevailing wave attack is from the southeast. It is powerful and oblique to most of the coast, consequently driving a river of sand northwards along shore. Typically, northward pointing spits develop from promontories which then shelter quiet bays, and most river mouths (except for some in the Bay of Maputo, where wave attack is frontal) are diverted northwards behind dune covered spits. Mangroves are confined to the southern shores of bays, and to estuaries and lagoons. The mouths of rivers with low winter discharge rates tend to be occluded by the development of sand-bars so that brackish lagoons develop behind or between the dunes. Such lagoons may be tidal in summer, or they may open to the sea only for a few days each year following heavy rain in the catchments. Where coastal emergence has occurred small streams have often changed course, abandoning their estuaries and finding new routes to the sea. In this way lagoons of varying sizes become isolated as lakes on the landward side of the plain immediately adjacent to the active dunes. Lake Sibaya in northern Natal was almost certainly formed in this way and appears to represent an estuary abandoned when the Pongolo River turned north. Only a few kilometres distant, at Kosi Bay, the abandoned estuary of the Ingwavuma River reveals an earlier stage in the process. Although the lake system is still tidal its connection with the sea is tenuous, and the mouth of the system has been closed by sand-bars several times this century. It seems likely that the remnants of this estuary will eventually be isolated from the sea. Numerous lakes with an apparently similar heritage are found along the entire length of the coastal plain. Both the Pongolo and Ingwavuma Rivers have been captured by the Usual River, which has itself been turned northwards and now occupies a swampy depression between lines of old stranded dunes. The swales between stranded dunes on low-lying parts of the plain are often extensive, invariably swampy, and the type of wetland they support occurs throughout the plain.

All rivers crossing the plain are liable to overtop their banks following storms in their catchments, but some, such as the Pongolo, Pungue and Changane, regularly inundate broad floodplains during the rainy season. The courses of these rivers are marked by a succession of pans, pools, swamps and lagoons adjacent to the river bed. Some of these are perennial, while others hold shallow water for but a few months each year.

### **The Zambezi Basin**

The Zambezi River rises 1585 m asl in a sponge near Kalene Hill (11°10'S/24°12'E) on the northern rim of the plateau in the extreme northwest of Zambia. It first flows north, then west into Angola, then south receiving eleven major tributaries in a 280 km stretch across the high plateau, during which distance it loses 300 m of altitude before re-entering Zambia at Caripande. Above this point the river is bridged five times. Immediately across the border in Zambia the stream widens and descends two falls near Chavuma, then the Nyamboma Rapids, and then receives two major tributaries, the Kabompo on the east bank and the Lungue-Bungo on the west, having then descended to an altitude of 1000 m. The first major wetland of the system occurs on the Lungue-Bungo which rises in Angola. This river descends comparatively steeply from its source in the northern highlands to the Zambian border, but thereafter it traverses a plain which becomes progressively more swampy as it approaches a confluence with two subsidiary streams, about 60 km above the Zambezi. The floodplains of all three tributary rivers merge in a permanent swamp

which extends to 75 km in length and 25 km in width at high water and then covers an area approaching 100 000 ha. This swamp, which is sometimes referred to as the Nyamboma Swamp, is situated in a sparsely populated, tsetse fly infested area which has few communications and is poorly known.

Below its confluence with the Lungue-Bungo the Zambezi begins to flow more slowly and has developed a seasonal floodplain in a shallow marshy valley throughout Barotseland. The floodplain first develops on the west bank above Likulu, and on the east bank some 15 km farther south. It extends for over 250 km to the south of Senanga, reaching widths of 40 km and maximum areas approaching 770 000 ha at high water. Inundation is highly seasonal and areas of permanent swamp are comparatively small. In traversing the Barotseland Plain the river meanders so much that its length exceeds 590 km. However, the river is bridged at Lealui, in the middle of the plain, close to the confluences of two other tributaries, each of which also drains an important wetland system. The first tributary, the Luena, flows for 100 km through the Luena Flats, towards the lower end of which it loses its integrity and breaks up into many shifting streams in an area of permanent swampland. In total some 90 000 ha of land is flooded at the height of the rainy season, although rather less than 50% of this is permanent swampland. At the lower end of the flats, 60 km above the confluence with the Zambezi on the east bank, the Luena again emerges as a single stream. The second tributary, the Luanginga, rises in Angola and is itself swollen by eight subsidiary streams before it reaches the Zambezi on the west bank. About 100 km above its confluence with the Zambezi one of its subsidiary streams, the Luete, drains the permanent Nyengo Swamp which has a maximum high water area of 70 000 ha.

At the southern extremity of the Barotse Floodplain, just south of Senanga, the Zambezi is joined on the west bank by the Lueti which drains several large plateau lakes near Chieme in Angola. Some few kilometres downstream the Lui enters on the east bank, having drained substantial areas of permanent swamp near its headwaters, and a seasonal floodplain in its lower course, prior to the confluence with the Zambezi. Then, at an altitude still close to 980 m, near Sioma, the Zambezi enters a long faulted trough in Karoo sediments. In this it plunges over the Ngony (Sioma) Falls and enters a 110 km stretch of rapids, ending in the Katima (Mulilo) Rapids, above which it forms the border between Zambia and Namibia along the northern tip of the Caprivi Strip. Here it flows over a sandy plain, on which it again meanders, and its flood waters spread southwards mingling with those of its next major tributary the Chobe. This latter stream forms the southern border of the Caprivi Strip, between Namibia and Botswana.

The Chobe rises in Angola as the Cuando (Kwando) and in common with its principal tributary, the Utembo, has a source in a sponge on the eastern side of the Lunda Divide (plateau rim) in Angola. Both streams flow southeastwards, out of the hills and inland across the plateau, and together drain a catchment of 96 778 km<sup>2</sup>. There are no important wetlands along the upper courses of these rivers, which are boulder strewn and full of rapids, although small reed swamps occur on some of their tributaries and parts of their upper courses carry thin fringes of *Phragmites*. However, in its lower reaches, the Cuando develops an intricately braided course for over 320 km along the border between Angola and Zambia as it approaches the Caprivi Strip. This it crosses, traversing the Linyanti Swamp en route, but emerging from the swamp, after a name-change, as the Chobe River. Much of the eastern extremity of the Caprivi Strip between the Zambezi and Chobe Rivers is flooded during the rainy season, with semi-permanent swampland occupying more than 150 000 ha, and the total area of inundation reaching 380 000 ha when the rivers are in spate. This latter

area is often also considered part of the Linyanti Swamp, and at times of highest water it extends outside the Caprivi Strip into both Botswana and Zambia. The Chobe and Zambezi Rivers meet between Kasane and Kazungula, at an elevation of 880 m, after which, as it approaches the Victoria Falls and the end of its upper course, the Zambezi has a mean width of 1350 m.

To the west of the Linyanti Swamp, in Botswana, is the Okavango Delta. This is fed principally by the Cubango or Okavango River. At times of high flood however, some of the water from the major eastern distributary of the Okavango River, the Bonga River, passes eastwards from the neck of the delta through swampy land to the so-called Selinda Spillway. This leads to the Linyanti Swamp. Thus from here some Okavango water may find its way to the Zambezi via the Chobe River. The prospect of the Chobe eventually capturing the waters of the Okavango by backward erosion of the head of the Selinda Spillway clearly exists. The Linyanti Swamp also receives water from Botswana via the Savuti Channel. At times water in this flows northwestwards, entering the Linyanti Swamp at its southeastern extremity, thus at times, the Zambezi drains a small part of Botswana. The middle course of the Zambezi extends for almost 1000 km, from the Victoria falls eastwards, through Lake Kariba, to Lake Cahora Bassa. The river marks the border between Zambia and Zimbabwe until it enters the western end of Lake Cahora Bassa at the twin towns of Luangwa (Feira) and Zumbo, which lie astride the Zambia-Mozambique border. Lakes Kariba (563 100 ha at upper storage level) and Cahora Bassa (266 500 ha at upper storage level) are currently the third and fifth largest impoundments in Africa. In its middle course the Zambezi receives two of its most important tributaries, the Kafue and Luangwa Rivers, on the Zambian bank, and the Gwai (Shangani), Sanyati and Hunyani on the Zimbabwean bank. The southern tributaries rise high on the eastern watershed of the plateau near Bulawayo, Gweru (Gwelo) and Harare respectively. The Sanyati now discharges into Lake Kariba, while the Hunyani enters Lake Cahora Bassa.

Further important wetlands are situated in the Kafue Basin in Zambia. Here the Kafue River drains an area of 155 000 km<sup>2</sup> and has several sources high on the central northern rim of the plateau, at elevations between 1370 and 1560 m asl. Upstream the Kafue receives first the Lushwishi and then the Lukanga Rivers as tributaries. The course of the latter stream disappears in the Lukanga Swamp which occupies a shallow depression of 259 000 ha, from which it reappears as a discrete stream just prior to its confluence with the Kafue River. Subsequently, on the other (west) bank the Kafue receives its largest tributary, the Lunga, and then a few kilometres downstream, the Lufupa, the latter draining Busanga Swamp. This swamp is only slightly smaller than that at Lukanga. From the Lufupa confluence the river flows due south, traversing the Mpatamatu Gorge to an impoundment at Itezhitezhi. From here it swings eastwards and meanders, with a broad floodplain, across the 256 km length of the Kafue Flats to another impoundment at Kafue Gorge. The hydrological regime of this important floodplain is now controlled by the two dams at its western and eastern extremities. Open water now covers some 85 000 ha behind the Itezhitezhi Dam, while the permanent lake at Kafue Gorge may shrink to 120 000 ha at low water and expand to 435 000 ha at high water, making it currently the fourth largest impoundment in Africa. The total area of the Kafue Flats has been estimated as 705 000 ha, of which, prior to control, over 500 000 ha could be inundated in a wet year. However, with the advent of regulation, the area flooded each year is now always less than this. From the Kafue Gorge Dam the river descends a series of steep rapids, losing 610 m in altitude over 24 km, before discharging into the Zambezi opposite the town of Chirundu in Zimbabwe.

The high, wetter, regions of the Kafue catchment, and indeed the higher parts of all other catchments tributary to the Zambezi, are riddled with 'dambos'. These are isolated, shallow,

seasonally or semi-permanently waterlogged depressions, generally saucer-shaped in section. Locally they cover as much as 10% of the total land surface and are then the most conspicuous feature of the landscape. Drainage from dambos is diffuse, and collectively they exercise a profound influence on the surface hydrology of a basin and thus merit consideration as important wetlands. Further they harbour several species uncommon in other habitats. Numerous small marshes occur on the southern tributaries in the highlands of Zimbabwe, and on the Luangwa in the far north of Zambia as it traverses the upper part of the plateau. The Luangwa rises at an elevation of 1600 m asl, in the far north of Zambia, just south of Chitipa, at a latitude of 9°45'S. It flows south, and then southwest across the upper plateau, before descending comparatively steeply and flowing along the line of the Muchinga Escarpment to the Zambezi, which it joins at the town of Luangwa, at the head of Lake Cahora Bassa.

From Cahora Bassa the Zambezi descends from the plateau, flowing swiftly through a long narrow valley to reach the lowlands of Mozambique which it crosses to its delta on the Indian Ocean. It receives numerous tributaries in this lower section, all of which are streams which descend the scarp slopes along the eastern side of the plateau. The first and most important of these on the south bank is the Mazoe-Luenha, which drains the eastern highlands of Zimbabwe, and reaches the Zambezi some 50 km below the town of Tete. The most important on the north bank is the Shire River, which drains a vast catchment around Lake Malawi.

Three countries border Lake Malawi: Tanzania, Mozambique and Malawi. Mountains surrounding the lake rise to 2035 m in the southwest and 2959 m in the northeast. Numerous short streams feed the lake which drains southward via the Shire River through Lake Malombe and the Shire Marshes to the Zambezi. Lake Malawi, which lies in the southern part of the East African Rift System, is situated along the eastern, seaward, side of the plateau. It has a mean surface height of 474 m asl, a total open water area of 2 975 000 ha, and stretches 558 km from north to south, with a maximum east-west dimension of 89 km. In places it is fringed by swamps and marshes. South of Lake Malawi the Shire Marshes comprise an almost continuous tract of permanent wetland to the confluence with the Zambezi, with a total area in Malawi and Mozambique in the vicinity of 130 000 ha. Seasonal floodplains also occur in a narrow strip along parts of the lower Zambezi, in the Zambezi Delta, and over parts of the coastal plain where ancient distributaries of the Zambezi once flowed.

## **Vegetation**

The vegetation of Region 5 is complex. Much of the southwestern seaboard is occupied by the Namib Desert, inland of which are long parallel zones of thorny bush and scrub. Farther north in Angola, the coastal desert gives way to steppes and these to wooded grasslands, while much of Cabinda is covered by typical West African coastal forest. A strip of East African coastal forest and scrub occupies almost all of the Indian Ocean coast, grading westwards, inland, to *Acacia* savannas and these, at altitude, to Afro-montane vegetation on the eastern rim of the plateau.

A mosaic of different bushy types, mostly evergreen, occupies the far south, but these give way in passing north to highveld grasslands along the interior slopes of the Drakensberg Mountains, and to *Acacia* savanna in the southern central plateau. In proceeding northwards over the central plateau Zambezian woodlands appear. These also contain much *Acacia*, and in their turn grade into mopane (*Colophospermum*

*mopane*) woodlands or into more closed Zambezian forest types. The northern interior is largely covered by miombo woodland, characterised by the dominance of *Brachystegia*, *Isoberlinia* and *Julbernardia* species.

The southern tip of Africa, and in particular the southern Cape Province of South Africa, has been one of the great centres of angiosperm evolution and presently harbours one of the richest regional floras in the world, c. 16 000 spp. Temperate species have migrated northwards from the Cape, while tropical species have moved south so that many species in Africa reach their southerly or northerly limits of distribution in a transitional zone in the middle latitudes of Region 5. However, floristically, Southern Africa has been rather isolated since before the beginning of the Tertiary. Unless mediated by migratory birds, plant migrations must have taken place along the coast or overland, where, in both cases, the tropics have constituted a barrier. The temperate species of the Cape Province have probably been speciating separately for a very long time. The variety of wetland types in this region, which encompasses such a rich vegetation and range of habitats, does not lend itself to a single brief description. Thus separate accounts are given for each country.