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Chapter 9

Environmental Management

Environmental management in South Africa is the responsibility of various government institutions. At central government level, the Department of Environmental Affairs and Tourism is the central policy-formulating and coordinating body. Other organisations involved at this level include the departments of Agriculture, Water Affairs and Forestry, Minerals and Energy, and Health.

At regional level, the provincial conservation agencies are major role-players, and independent statutory organisations such as the South African National Parks (SANParks) and National Botanical Institute (NBI) are valuable partners in the country's total conservation effort.

In accordance with the National Environment Management Act, 1998 (Act 107 of 1998), the Committee for Environmental Coordination was established to harmonise the work of departments on environmental issues and coordinate environmental implementation and national management plans at provincial level. The Act lays down principles for effective management of the environment, which all organs of the State have

to comply with in decision-making. The Act also makes provision for the establishment of the National Environmental Advisory Forum, where stakeholders and experts can advise the Minister on environmental management issues.

Each province may promulgate its own ordinances dealing with hunting, fishing and the protection of fauna and flora.

State of the environment

Twenty per cent of South African households and one sixth of the global population live in poverty, many without proper housing, water supply, sanitation or waste disposal services. They also have limited access to health care and education.

The greatest challenge for South Africa and the rest of the world is to improve the quality of human life for both present and future generations, without depleting its natural capital. This can only be achieved through a healthy natural environment, which supplies raw materials, absorbs and treats waste products, and maintains water, soil and air quality.

Food security, water provision and climate stability depend on having properly functioning ecosystems, maintained levels of biodiversity, sustainable rates of resource extraction, and a minimal production of waste and pollution.

To this end, the United Nations General Assembly Conference on Environment and Development developed and adopted

◀ A groundbreaking process to ensure that the allocation of fishing rights across 22 commercial fishing sectors is credible and equitable, started unfolding on 27 August 2001. Through the new process government intends to allocate medium-term fishing rights worth an estimated R10 billion over four years. The allocation process will introduce stability and black economic empowerment in the South African fishing industry

Agenda 21 in 1992 as the global strategy for sustainable development.

South Africa has taken several steps to implement Agenda 21 at national and local level, including reforming environmental policies, ratifying international agreements and participating in many global and regional sustainable development initiatives. South Africa is also striving to empower its people through enhanced access to information, including environmental information.

Biological diversity

South Africa enjoys the third-highest level of biodiversity in the world. The country's rich natural heritage is vast, and staggering in its proportions. For example, over 3 700 marine species occur in South Africa and nowhere else in the world. The remarkable richness of South Africa's biodiversity is largely the result of the mix of tropical Mediterranean and temperate climates and habitats occurring in the country. Some 18 000 vascular plant species occur within South Africa's boundaries, of which 80% occur nowhere else.

In addition to South Africa's extraordinarily varied plant life, a wealth of animal life exists in the region. The country hosts an estimated 5,8% of the world's total mammal species, 8% of bird species, 4,6% of the global diversity of reptile species, 16% of the total number of marine fish species in the world, and 5,5% of the world's described insect species. In terms of the number of mammal, bird, reptile and amphibian species which

occur only in this country, South Africa is the 24th-richest country in the world and the fifth-richest in Africa.

South Africa has a diversity of spiders – 66 families comprising more than 6 000 species. The country also boasts 175 species of scorpion.

South Africa's marine life is similarly diverse, partly as a result of the extreme contrast between the water masses on the east and west coasts. Three water masses – the cold Benguela Current, the warm Agulhas Current and oceanic water – make the region one of the most oceanographically heterogeneous in the world. According to the *White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity*, over 10 000 plant and animal species – almost 15% of the coastal species known worldwide – are found in South African waters, with about 12% of these occurring nowhere else.

The easiest way to describe the country's natural heritage is on the basis of a systematic classification of regions, or biomes. A biome can be defined as a broad ecological unit, representing a major life zone extending over a large area, which contains relatively uniform plant and animal life that is closely connected to environmental conditions, especially climate.

The White Paper states that South Africa is one of the six countries in the world to have an entire plant kingdom within its national confines. Known as the Cape Floral Kingdom, this area has the highest recorded species diversity for any similar-sized temperate or tropical region in the world.

Other biomes in the country are also of global conservation significance; for example, one-third of the world's succulent plant species is found in South Africa.

There are seven major terrestrial biomes, or habitat types, in South Africa. These biomes can, in turn, be divided into 68 vegetation types.

The degree to which each of these biomes is threatened varies, depending on the fertility of the soil, the economic value derived



Important dates in 2001

- World Wetlands Day: February 2
- National Water Week: March 19 to March 25
- Earth Day: March 20
- World Water Day: March 22
- World Meteorological Day: March 23
- World Environment Day: June 5
- World Desertification Day: June 17
- National Arbor Week: September 1 to September 7
- International Day for the Protection of the Ozone Layer: September 16
- World Tourism Day: September 27
- World Habitat Day: October 4
- National Marine Day: October 20



Species richness of South African taxa

| Taxa | Number of described species in SA | Percentage of earth's species |
|-----------------|-----------------------------------|-------------------------------|
| Mammals | 227 | 5,8 |
| Birds | 718 | 8,0 |
| Amphibians | 84 | 2,1 |
| Reptiles | 286 | 4,6 |
| Freshwater fish | 112 | 1,3 |
| Marine fish | 2 150 | 16 |
| Invertebrates | 77 500 | 5,5 |
| Vascular plants | 18 525 | 7,5 |

Source: *White Paper on the Conservation and Sustainable use of South Africa's Biological Diversity*

from use of the area, human population pressures, and the extent to which the biome is conserved in protected areas.

Savanna biome

This biome is an area of mixed grassland and trees, and is generally known as bushveld.

In the Northern Cape and Kalahari sections of this biome, the most distinctive trees are the camel thorn (*Acacia erioloba*) and the camphor bush (*Tarchonanthus camphoratus*). In the Northern Province, the portly baobab (*Adansonia digitata*) and the candelabra tree (*Euphorbia ingens*) dominate. The central Bushveld is home to species such as the knob thorn (*Acacia nigrescens*), bushwillow

(*Combretum* spp.), monkey thorn (*Acacia galpini*), mopani (*Colophospermum mopane*) and wild fig (*Ficus* spp.) In the valley bushveld of the south, the trees euphorbias and spekboom (*Portulacaria afra*) are predominant.

An abundance of wild fruit-trees provide food for many birds and animals in the savanna biome.

Grey louries, hornbills, shrikes, flycatchers and rollers are birds typical of the northern regions. The subtropical and coastal areas are home to Knysna and purple-crested louries and green pigeons. Raptors occur throughout the biome.

The larger mammals include lion, leopard, cheetah, elephant, buffalo, zebra, rhinoceros, giraffe, kudu, oryx, waterbuck, hippopotamus and many others.

Approximately 8,5% of the biome is protected. The Kruger National Park, Kgalagadi Transfrontier Park, Hluhluwe-Umfolozi Park, Greater St Lucia Wetlands Park and other reserves are located in the savanna biome.

Nama-Karoo biome

This biome includes the Namaland area of Namibia and the Karoo area of South Africa.

Because of low rainfall, rivers are non-perennial. Cold and frost in winter and high temperatures in the summer demand special adaptations from plants. The vegetation of this biome is mainly low shrubland and grass, with trees limited to water courses. The bat-eared fox, black-backed jackal, ostrich, suricate and ground squirrel are typical of the area.

Only 1% of the Nama-Karoo biome falls within officially protected areas, of which the Karoo and Augrabies national parks are the largest.

Overgrazing and easily eroded soil surfaces cause this semi-desert to creep slowly in on the neighbouring savanna and grassland biomes.

Grassland biome

This biome is a summer-rainfall area with heavy thunderstorms and hail, and frost in winter. A number of perennial rivers such as

Information

The 55th Session of the United Nations Conference on Environment and Sustainable Development (UNCED) has decided that South Africa will be the host of the 2002 World Summit on Sustainable Development in September 2002.

To signal the high importance of this event, Heads of States will attend the Summit, along with more than 60 000 delegates. The Summit is expected to generate R1,6 billion and create more than 16 000 jobs.

There is wide consensus that the primary focus of the Summit should be on poverty, development and the environment. Poverty and underdevelopment are seen as the fundamental threats to environmental security and sustainable development.

Biodiversity values for the different provinces in South Africa

| | Biome | Veld type | Number of species | | | | |
|-------------------|-------|-----------|-------------------|--------|------|-----------|---------|
| | | | Plant | Mammal | Bird | Amphibian | Reptile |
| Eastern Cape | 7 | 29 | 6 164 | 156 | 384 | 51 | 57 |
| Free State | 3 | 17 | 2 984 | 93 | 334 | 29 | 47 |
| Gauteng | 2 | 8 | 3 303 | 125 | 326 | 25 | 53 |
| KwaZulu-Natal | 4 | 19 | 6 141 | 177 | 462 | 68 | 86 |
| Mpumalanga | 3 | 15 | 4 782 | 160 | 464 | 48 | 82 |
| North-West | 2 | 11 | 3 025 | 138 | 384 | 27 | 59 |
| Northern Cape | 6 | 18 | 5 067 | 139 | 302 | 29 | 53 |
| Northern Province | 3 | 14 | 4 236 | 239 | 479 | 44 | 89 |
| Western Cape | 6 | 18 | 8 925 | 153 | 305 | 39 | 52 |

Source: Department of Environmental Affairs and Tourism

the Orange, Vaal, Pongola, Kei and Umzimvubu originate in and flow through the area. Trees are scarce and are mainly found on hills and along river beds. Karee (*Rhus lancea*), wild currant (*Rhus pyroides*), white stinkwood (*Celtis africana*) and several acacia species are the most common.

The grassland biome has been identified as an area with a high percentage of plants indigenous to the country. Eight mammal species endemic to South Africa occur in a wild state in this biome. Three of these, namely the black wildebeest, blesbok and eland, do not occur outside the grassland biome.

The area is internationally recognised as an area of high species endemism insofar as birds are concerned. Birds commonly found in the area include the black korhaan, blue crane, guinea-fowl and other grassland birds.

Only 1,1% of the grassland biome is officially protected. The wilderness areas of the KwaZulu-Natal Drakensberg are the most significant.

Succulent Karoo biome

One of the natural wonders of South Africa is the annual blossoming of the Namaqualand wild flowers (mainly of the family *Asteraceae*), which transforms the semi-

desert of the Northern Cape into a fairyland. After rain, the drab landscape is suddenly covered from horizon to horizon with a multi-coloured carpet (August to October, depending on rainfall).

This is a winter-rainfall area with extremely dry and hot summers.

For this reason, succulents with thick, fleshy leaves are plentiful. Trees mostly have white trunks to reflect heat.

In the Richtersveld to the north, the quiver tree (*Aloe dichotoma*) the human-like elephant's trunk (*Pachypodium namaquanum*), many species of aloe and the *spekboom* (*Portulacaria afra*), very typical of the Little Karoo, are also present. Grass is scarce.

Animal life is similar to that of neighbouring biomes (*Fynbos* and Nama-Karoo).

The Richtersveld, Tankwa-Karoo and Namaqua national parks have improved the conservation status of this biome considerably.

Fynbos biome

The *Fynbos* biome is one of the six accepted floral kingdoms of the world. This region covers only 0,04% of the land surface of the globe.

Fynbos occurs mostly in the Western Cape within an area of about 70 000 km². It is



mainly a winter-rainfall area, and the *fynbos* vegetation is similar to that of Mediterranean regions.

Fynbos is the name given to a group of evergreen plants with small, hard leaves (such as the *Erica* family). It is made up of three groups of plants, namely the proteas, the heathers and the restios, and incorporates a diversity of plant species (more than 8 500 kinds, more than 6 000 of which are endemic).

The *Fynbos* biome is home to the protea, for which South Africa is renowned. The biome also contains flowering plants now regarded as garden plants, such as freesia, tritonia, sparaxis and many others.

Protected areas cover 13,6% of the *Fynbos* biome and include the Cape Peninsula and Agulhas national parks.

The biome is not very rich in bird and mammal life, but a few animals like the grysbuck, the geometric tortoise, the Cape sugar-bird and the protea seed-eater are endemic to the area. The mountains are the habitat of the leopard, baboon, several types of eagle, honey-badger, caracal and rhe-buck.

Forest biome

South Africa is poor in forests. The only forests of significance are the Knysna and Tsitsikamma forests in the Western and Eastern Cape.

Other reasonably large forest patches that are officially protected are in the high-rainfall areas of the eastern escarpment and on the eastern seaboard. Forest giants such as yellowwood (*Podocarpus* spp.), ironwood (*Olea capensis*) and lemonwood (*Xymalos monospora*) dominate.

The indigenous forests are a magical world of ferns, lichens and colourful forest birds such as the Knysna lourie, the endangered

Cape parrot and the rameron pigeon. Animals include the endangered samango monkey, the bushpig, the bushbuck and the delicate blue duiker.

Thicket biome

Subtropical thicket is a closed shrubland to low forest, dominated by evergreen succulent trees, shrubs and vines.

It is often impenetrable and has little herbaceous cover. Thicket types contain few endemics, most of which are succulents of Karoo origin.

Preserving genetic diversity

Human activity has been changing South African ecosystems for thousands of years, but the pace and extent of change increased rapidly with agricultural and industrial development.

Present estimates suggest that a substantial proportion of natural habitat has been transformed largely by agriculture, urban developments, afforestation, mining and dams.

In addition to habitat loss and degradation, the over-exploitation of certain species, the introduction of exotic species, and the pollution or toxification of the soil, water and atmosphere have had major effects on South Africa's terrestrial, freshwater and marine biodiversity.

Some 3 435 (15%) of South Africa's plant species, 102 (14%) of its bird species, 72 (24%) of its reptile species, 17 (18%) of its amphibian species, 90 (37%) of its mammal species and 142 (22%) of its butterfly species are listed as threatened in the South African *Red Data Book*, which indicates the conservation status of threatened species and ecosystems.

Eleven of the 19 indigenous freshwater fish species in Western Cape rivers, 16 of which are endemic, are critically rare or endangered according to the International Union for the Conservation of Nature's (IUCN) *Red Data Book* criteria.

One of the world's best known leatherback turtle breeding grounds can be found on the

Information

Of the 1,2 million foreign visitors each year, it is estimated that between 750 and 1 500 are international bird watchers who bring in between R10 million and R25 million.

Maputaland coast of KwaZulu-Natal. The turtle nesting season started in November 2000 resulting in KZN Wildlife (previously known as KwaZulu-Natal Nature Conservation Service) closing certain sections of beaches at St Lucia, Cape Vidal and Sodwana Bay to vehicular traffic from November 2000 to the end of March 2001. The Maputaland sea turtle research programme, started in 1963 and run by KZN Wildlife, is the longest running turtle research and conservation programme on leatherback and loggerhead turtles. The project recorded a slow but steady increase in the number of nesting turtles.

According to BirdLife International, over 60 bird species in South Africa are threatened, five of which are considered as critical. These include the bittern, wattled crane, white-winged flufftail, Rudd's lark and blue swallow. The Rudd's lark (*Heteromirafra ruddi*) is considered the most endangered lark species in the world, with fewer than 100 individuals occurring in reserves in the country.

Eleven bird species are also listed as endangered, and include species such as the bearded vulture, saddle-billed stork, Cape parrot and spotted thrush.

Three of the world's 15 crane species are found in South Africa. The country's national bird, the blue crane, as well as South Africa's largest and rarest crane, the wattled crane, are both listed as 'critically endangered', while Africa's most common crane, the grey crowned crane, is listed as 'endangered'.

The wattled crane population in South Africa has reached seriously low levels, with current estimates putting their numbers at only 250 individuals. There are only 80 active breeding pairs.

The availability of suitable breeding habitat limits the wattled crane population. Most wattled cranes in South Africa are now found in KwaZulu-Natal and Mpumalanga. Although protective areas have been established (i.e. Verloren Vlei Nature Reserve in Mpumalanga, and the Umgeni Vlei and Karkloof Reserve in KwaZulu-Natal), the ultimate survival of this population lies in the hands of private landowners.

The South African Crane Working Group, an Endangered Wildlife Trust project, started interacting with landowners and land users to address issues relating to crane conservation on their properties. Loss of wetland habitat, intensive agriculture, industrialisation, irresponsible use of agricultural chemicals and disturbances at nest sites all threaten the survival of South Africa's three crane species.

South Africa has 18 eagle species, and National Eagle Day was celebrated on 6 October 2000. The event was organised by the Raptor Conservation Group and short-term insurer SA Eagle. The latest edition of the South African *Red Data Book* lists nine of the region's 14 scavenging birds as being rare, vulnerable or endangered.

The single largest breeding colony of Cape vultures in the world, about 800 pairs, can be found in the Marakele National Park in the Northern Province.

According to the 1997 IUCN *Red List of Threatened Plants*, South Africa has lost 53 plant species to extinction. Another 11% of the country's 20 000 plant species are at risk of extinction.

Numerous organisations are working together to save fauna and flora species. Over recent years, there have been numerous conservation success stories. These include the Southern Right whale (*Balaena glacialis*), leatherback turtle (*Dermodochelys coriacea*), Cape mountain zebra (*Equus zebra zebra*), white rhinoceros (*Ceratotherium simum*), black rhinoceros (*Diceros bicornis*), African elephant (*Loxodonta africana*), cheetah (*Acinonyx jubatus*), bontebok (*Damaliscus dorcas dorcas*) and black wildebeest (*Connochaetes gnou*).

Information

The Cape Peninsula National Park launched a conservation development framework late in 2000, which looks at a five-year plan to guide conservation and development in and around the 21 000-ha Park. Among other things, the framework aims to demarcate broad 'use zones' within the Park and establish and rationalise new and existing visitor access points.



Relocation and breeding programmes include rhinoceros, elephant, roan and sable antelope, buffalo, cheetah, wild dogs and redbilled oxpeckers. It is estimated that the rhino population in southern Africa is at its highest in 50 years.

Since 1988, SANParks has conducted six successful relocation projects with redbilled oxpeckers captured in the Kruger National Park and re-established in conservation areas in their former range. One of the relocation projects was at the Addo Elephant National Park in the Eastern Cape, where 22 of these birds were released in 1990.

With regard to migratory species, of which migratory birds form the major component, South Africa is a signatory to the Convention for the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979). The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention, 1971) ensures the conservation of the habitats of all migratory waterfowl.

Protected areas

Protected areas are managed to conserve living resources that are essential for sustainable development.

Conservation in these areas is applied by

- maintaining essential ecological processes and life-supporting systems
- preserving genetic diversity
- controlling erosion of soil and soil depletion
- providing opportunities for research, education and monitoring
- ensuring that utilisation of species and ecosystems is sustainable (World Conservation Strategy, IUCN 1980).

In these protected areas, endangered and rare fauna and flora are conserved, ecologically degraded habitats are restored, cultural and historic treasures such as rock art and historic buildings are preserved, and water catchment areas are protected.

There are eight management categories of protected areas in South Africa, which conform to the accepted categories of the IUCN.

According to the *National Register of Protected and Conservation Areas in South Africa*, there are 403 formally protected areas covering 5,4% of the land surface area. These areas are under the control of national, provincial and local government.

There are also 463 private reserves in South Africa, bringing the number of protected areas to 1 174 or nearly 7% of the land surface area. Although the extent to which viable populations are conserved in such areas is not known, about 74% of the plant, 92% of amphibian and reptile, 97% of bird and 93% of mammal species of South Africa are estimated to be represented.

Scientific reserves

Scientific reserves are sensitive and undisturbed areas managed for research, monitoring and maintenance of genetic sources. Access is limited to researchers and staff. Examples of such areas are Marion Island and the Prince Edward Islands near Antarctica.

Wilderness areas

These areas are extensive in size, uninhabited and undeveloped, and access is strictly controlled since no vehicles are allowed. The highest management priority is the maintenance of the intrinsic wilderness character. Examples of wilderness areas are the Cedarberg Wilderness Area and Dassen Island in the Western Cape, and Baviaanskloof Wilderness Area in the Eastern Cape.

National parks and equivalent reserves

These areas include national parks proclaimed in terms of the National Parks Act, 1976 (Act 57 of 1976), provincial parks and nature reserves, and indigenous State forests.

Some of these natural and scenic areas are extensive in size, and include large representative areas of at least one of the country's biomes. Since 1994, parks under SANParks have expanded by 227 307 ha.

In 2001, for the first time, the Department of Environmental Affairs and Tourism's budget provided for the purchase of land to be incor-

porated into national parks. An amount of R8 million has been earmarked for this purpose.

The national parks are: Kruger National Park, Kalahari Gemsbok National Park (part of the Kgalagadi Transfrontier Park), Addo Elephant National Park, Bontebok National Park, Mountain Zebra National Park, Golden Gate Highlands National Park, Tsitsikamma National Park, Au-grabies Falls National Park, Karoo National Park, Wilderness National Lakes Area, West Coast National Park, Tankwa-Karoo National Park, Knysna National Lakes Area, Marakele National Park, Richtersveld National Park, Vhembe/Dongola National Park, Vaalbos National Park, Agulhas National Park, Namaqua National Park and Cape Peninsula National Park, which incorporates the Cape of Good Hope, Table Mountain and Silvermine nature reserves. The Addo Elephant National Park is being transformed into the Greater Addo National Park by extending its boundaries to the coastline east of Port Elizabeth.

South Africa and Botswana manage the Gemsbok National Park in Botswana and the Kalahari Gemsbok National Park in South Africa as a single ecological unit, known as the Kgalagadi Transfrontier Park. The two parks cover an area of 38 000 km².

Following on the success of the Kgalagadi Transfrontier Park, on 10 November 2000, the governments of South Africa, Mozambique and Zimbabwe signed an agreement to establish the Great Limpopo Transfrontier Park (until recently the Gaza/Kruger/Gonarezhou Transfrontier Park). This will be the world's greatest animal kingdom encompassing an area of 40 000 km² and is recog-

nised as the world's biggest conservation and ecotourism project. The 120-km long stretch of fence that separates the Kruger from Mozambique will be removed. The first of 1 000 elephants will also be translocated from the Kruger to Mozambique – the biggest operation of its kind in the world.

The proposed Park has two main objectives: promoting biodiversity conservation on a regional basis across international boundaries, and socio-economic upliftment of rural communities living in and around the Park. Private enterprise will be involved extensively in developing and operating the many ecotourism opportunities made available by this initiative. In developing these ecotourism opportunities, job creation for local communities will be a priority.

Visitors to the Park will be able to cross into neighbouring Mozambique without a passport. Plans being considered by the Government mean that tourists will need their passports only if they use Mozambique to exit the Great Limpopo Transfrontier Park. If they return to South Africa via the Kruger Park, customs formalities will not be necessary.

Prince Bernhard of The Netherlands bestowed the Order of the Golden Ark Award on Mr Valli Moosa, South Africa's Minister of Environmental Affairs and Tourism, Helder Muteio, Minister of Agriculture and Rural Development of Mozambique, and Minister Francis Nhema, Minister of Environment and Tourism of Zimbabwe for their contribution towards the development and establishment of the Great Limpopo Transfrontier Park and Transfrontier Conservation Area (TFCA).

The Order of the Golden Ark is an Honorary Order, established in 1971. It aims to recognise individuals dedicated to the conservation of nature. The Order of the Golden Ark has been bestowed on only 300 people worldwide.

A trilateral co-operation agreement to promote conservation was signed between South Africa, Swaziland and Mozambique in June 2000. The borders separating conserva-

Information

Three live coelacanths were discovered in the St Lucia Marine Protected Area, just off the Greater St Lucia Wetland Park, by a group of recreational divers in December 2000. Until then, the 360-million-year-old species had been found alive only in the Comoros and Indonesia.

The Minister of Environmental Affairs and Tourism declared an emergency measure, in terms of the Marine Living Resources Act, 1998 (Act 18 of 1998), to protect the living coelacanths found at St Lucia.



tion areas of these three countries will be taken down.

The establishment of the Lubombo TFCA supports the broader aims and socio-economic upliftment of the southern Africa sub-continent, as well as improving regional ecosystems management. Its major objectives are economic development, ecological and financially sustainable development, and the development of joint strategies for transfrontier ecological planning and resource management.

Four specific areas targeted in the protocol are the:

- Lubombo Ponto de Ouro-Kosi Bay marine and coastal area on the Mozambique-South African borders
- Ndumo-Tembe-Futi elephant reserves on the border of Mozambique
- Nsubane-Pongolo (Josini) area on the border of Swaziland
- Lubombo Conservancy-Hlane-Mlawula-Goba area on the border of Mozambique and Swaziland.

In June 2001, an agreement was signed with Lesotho to establish the Drakensburg/Maluti TFCA. The integrity of a great African mountain, divided by colonialism, is to be restored. The Global Environmental Fund has allocated R120 million for this project. The TFCA comprises 8 113 km², made up of 5 170 km² (64%) in Lesotho and 2 943 km² (36%) in South Africa and is a transboundary initiative that forms an important component of the New Partnership for Africa's Development.

In August 2001, a Memorandum of Understanding was signed between Namibia and South Africa on the establishment of the Ais-Ais-Richterveld TFCA. The proposed TFCA comprises approximately 5 806 km², of which

32% is in South Africa and the remaining 68% on the Namibian side of the border.

From preserving natural assets in the early years, wildlife management in national parks has progressed to the drawing up of management plans for each individual park. This includes relevant research, initially limited to developing a database of species. All modern research in national parks has been designed to analyse and interpret functional and dynamic aspects of natural ecosystems. This programme includes annual aerial censuses of large mammal species. Through sophisticated computer systems, researchers keep accurate records of mammal distribution and densities, as well as environmental facts such as veld conditions and water supply.

Geographical information systems and other computer-driven systems are extensively used in the Kruger National Park and other parks. The development of immobilising drugs, improved game capture techniques and modern equipment have enabled SANParks to launch large game relocation projects to restock national parks, provincial reserves and private game reserves.

About 15 researchers work full-time in the Kruger National Park on topics ranging from HIV-positive lions to contraception for female elephants. The medicinal value of plants used by traditional healers is also under study. The Park has embarked on a new approach to environmental management, instituting education programmes and development aid in an attempt to reconcile its approach with neighbouring communities.

According to 1999 surveys, the elephant population of the Kruger Park constituted 9 152 of the approximately 12 000 African elephants in protected areas in South Africa. The ideal elephant population for the Park is about 7 000. Over the past two decades, 1 626 elephants have been translocated to other protected areas. No elephants have been culled since 1994. A new elephant management plan was accepted in 1999.

The Park is home to an estimated 1 500 felines.

Information

The fifth International Wildlife Ranching Symposium and Expo was held in Pretoria in March 2001. It was the second time the Symposium was hosted in South Africa. The Conference of the Tropical Game Commission of the International Hunting Council preceded the three-day Symposium.

The population of wild dogs in the Kruger National Park has shrunk from 450 to 200 in the past few years. The Park is the only viable refuge in the country of these endangered creatures. The Park is not certain of the reasons for the decline, but there has been a high mortality rate among puppies. Scientists ascribe it to the effects of natural phenomena, including the high rainfall in the past two seasons. It is estimated that there are at most about 500 wild dogs left in the whole of South Africa.

The Kruger National Park has tapped into its wealth of bird species to boost its income. With over 500 bird species, including black coucals, narina trogons, Pel's fishing owls, crowned eagles, black eagles and the African finfoot, the Park is a birding paradise. The Park hosts an annual Big Birding Day, which is becoming a very popular event.

South Africa has accepted the duty of making a positive and responsible contribution to the conservation of biodiversity and to the environment on a global scale. This is done through responsible participation in the affairs of the IUCN, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Ramsar, the World-wide Fund for Nature, and other agencies. There are other major protected areas proclaimed under other legislative instruments in South Africa, but which are equivalent to the national parks, such as the Greater St Lucia Wetlands Park, the Natal Drakensberg Park and the Hluhluwe-Umfolozi Park.

Fifteen-year concessions to private operators to build and run accommodation in national parks were granted in November 2000. This is because SANParks wants to

focus on its core business of conservation. The decision to grant the concessions will further improve the financial position of SANParks, which is no longer fully subsidised by the Government, and create employment in the parks. The granting is a first for SANParks and a radical departure from past policies. Rest camps will remain unaffected for the time being as the new policy involves less than 1% of the total amount of accommodation in national parks.

National and cultural monuments

These are natural features or features of cultural significance, or both, and may include botanical gardens, zoological gardens, natural heritage sites and sites of conservation significance.

In May 1997, South Africa ratified the World Heritage Convention. The identification of possible sites in South Africa and the coordination of the Convention are the responsibility of the South Africa World Heritage Convention Committee.

The World Heritage Convention Act, 1999 (Act 49 of 1999), allows for cultural and natural sites in South Africa to be granted World Heritage status, and makes the World Heritage Convention law in South Africa. The Convention obliges the South African Government to guarantee its implementation, ensure legal protection, and develop management plans and institutional structures for periodic monitoring.

The Act makes the principles of the Convention applicable to South Africa's world heritage sites and further provides for the adequate protection and conservation of these sites to promote tourism in a culturally and environmentally responsible way.

In December 1999, Robben Island, the Greater St Lucia Wetlands Park (GSWLP) and the Hominid sites at Swartkrans, Sterkfontein and Kromdraai, which had become known as the Cradle of Humankind, were proclaimed World Heritage sites by UNESCO. South Africa nominated the Ukhahlamba-Drakensberg Park for inscription as a World Heritage Site when the parties to the

Information

Fifteen South African elephants were relocated to Angola in September 2000 as part of Operation Noah. The elephants, which included a three-month-old calf, pregnant cows and young bulls, were relocated from the Madikwe Game Reserve in the North-West province to the Quicama National Park in Angola. They will be monitored by a team from the Centre for Wildlife Management of the University of Pretoria.



Convention on the Protection of the World Cultural and Natural Heritage met in Australia in November 2000.

The Ukhahlamba-Drakensberg Park was nominated as a mixed site. This was the first mixed (natural and cultural) site to be nominated by South Africa and became the 23rd mixed site of the 630 sites world-wide that currently have World Heritage Site status.

The Ukhahlamba-Drakensberg Park has a number of outstanding natural features linked to the geomorphic history of the sub-continent, including the high altitude and unique southern African alpine-tundra vegetation and its associated endemic palaeo-invertebrates. In addition to these natural assets and located within its original natural setting and ecosystems is one of the world's greatest rock art collections. The art represents a uniquely coherent tradition that embodies the beliefs and cosmology of a single people now extinct in the region, and is of outstanding cultural value.

The Gauteng Provincial Government will provide approximately R200 million over the next three years in order to

- preserve the hominid sites at Sterkfontein, Swartkrans and Kromdraai
- provide capital investment that will allow for the leveraging of private investment in the area
- contribute a key site for tourism
- add value to local development, tourism and job creation strategies.

Information

The Natural Heritage Programme, initiated by the Department of Environmental Affairs and Tourism and sponsored by private enterprise, is designed to register and conserve important natural sites in private ownership.

Areas such as special plant communities, sensitive catchment areas, good examples of aquatic habitats, habitats of endangered species and outstanding natural features qualify for such registration.

Ownership is not affected, and the owner of a natural site may request financial and technical assistance to manage the site.

To date, 325 sites have been registered, comprising a total of 460 293 ha.

As part of the restructuring of the State's forest assets, 12 000 ha of land currently under commercial forestry on the western and eastern shores of St Lucia is to be transferred to the GSWLP under the World Heritage Convention Act, 1999. The land will be incorporated into the conservation area and restored to its natural state. The land comprises 10 000 ha of forest on the western shores of the lake, and about 2 000 ha on the eastern shores where commercial forestry is to be phased out within two to five years. The western shores will be incorporated into the conservation area falling under the World Heritage Site.

Major strides have been taken in 2000 through the Lubombo Spatial Development Initiative process with key agencies to implement the Government's development strategy for the area. These are:

- in terms of the World Heritage Convention Act, 1999, draft regulations to establish an Authority for the area have been published
- an Interim Authority for the GSLWP to oversee the first phase of tourism tenders and establish the Park has been established
- in October the Government launched the tender of several key investment opportunities in the GSLWP, calling for expressions of interest
- a regional malaria programme was implemented in October with a spraying programme starting in southern Mozambique.

Through the process, more than R640 million is being invested in infrastructure and other development. Significant numbers of short-term jobs are being created that will translate into long-term job opportunities in tourism and supporting industries.

In August 2001, Deputy President Jacob Zuma released six elephants into the GSLWP as part of a long-term plan to turn the World Heritage Site into a 'Big Five' game reserve and international tourism destination. The return of elephants to St Lucia is the first step towards reinstating an ancient migration route for the Tembe elephants. The Park will become one of the few places on the globe

where tourists and locals will be able to see the largest water and land mammals – whales and elephants – at the same time.

Habitat and wildlife management areas

These areas are subject to human intervention, based on research into the requirements of specific species for survival. They include conservancies, provincial, regional or private reserves created for the conservation of species habitats or biotic communities, marshes, lakes, and nesting and feeding areas.

Protected land and seascapes

These areas are products of the harmonious interaction of people and nature, and include natural environments protected in terms of

the Environment Conservation Act, 1989 (Act 73 of 1989), scenic landscapes and historical urban landscapes.

Sustainable use areas

These areas emphasise the utilisation of products on a sustainable basis in protected areas such as the Kosi Bay Lake system in KwaZulu-Natal. Nature areas in private ownership are proclaimed and managed to curtail undesirable development in areas with high aesthetic or conservation potential.

Conservancies are formed in order to involve the ordinary landowner in conservation. One or more landowners can establish a conservancy where conservation principles are integrated with normal farming activities.

Wetlands

Wetlands include a wide range of inland and coastal habitats – from mountain bogs and fens and midland marshes to swamp forests and estuaries, linked by green corridors of streambank wetlands.

Wetlands were previously regarded as unproductive and even unhealthy wastelands. Today it is realised that, if well managed, they are essential in meeting the needs of a growing population.

South Africa became a contracting party to the Ramsar Convention in 1975, and the country's Ramsar sites include the Nylsvlei Nature Reserve, Blesbokspruit, Barberspan, Seekoievlei, the uKhahlamba-Drakensberg Park, Ndumo Game Reserve, the Kosi Bay System, Lake Sibaya, the turtle beaches and coral reefs of Tongaland, the St Lucia System, Wilderness Lakes, De Hoop Vlei, De Mond State Forest, Langebaan, Verlorenvlei and Orange River Mouth Wetland.

The Directorate: Biodiversity Management of the Department of Environmental Affairs and Tourism is responsible for the South African Wetlands Conservation Programme. The Programme has been developed to ensure that South Africa's obligations are met in terms of the Ramsar Convention and the aspects concerning aquatic ecology under the Convention on Biological Diversity.

Information

The South African Weather Service was officially launched on 17 September 2001 by the Minister of Environmental Affairs and Tourism.

The Weather Service will deliver public good services, mainly for the protection of life and property, as well as commercial services to the private sector as stipulated in the Weather Service Act, 2001 (Act 8 of 2001).

The Act provides for two distinct services, namely public good services which will be funded by government, and commercial services for which the user-pay principle will apply.

Public good services include weather and climate forecasting, a weather disaster warning system for the public good, services to subsistence farmers and fishers, the provision of information and advice to government, meeting regional and international treaty and agreement obligations, maintaining a national meteorological library, technical and scientific training in meteorology, and undertaking research to improve services.

Commercial services include the provision of specialised weather forecasting and climate information services, the provision of services to the maritime and aviation industry that are not included in international obligations, the provision of meteorological services, weather and climate-related publications, meteorological consultations including advice to the legal and insurance industries, contracted weather and climate-related research, research to improve commercial services, the dissemination of weather and climate information, the manufacturing and selling of meteorological equipment to government departments and users from the private sector, the provision of specialised services to the media, and commercial services provided on an *ad hoc* basis to government departments.



The Programme is aimed at building on past efforts to protect wetlands in South Africa against degradation and destruction, while striving for the ideal of wise and sustainable use of resources in such a way that the ecological and socio-economic functions of wetlands are sustained for now and the future.

South Africa is a member of Wetlands International, an international body dedicated to conserving the world's wetlands. In 2001, World Wetlands Day coincided with the 30th anniversary of the Signing of the Ramsar Convention on 2 February 1971. The worldwide theme for Wetlands Day 2001 was Wetlands World – A World to Discover. South Africa, through a partnership initiative between the departments of Water Affairs and Forestry and Environmental Affairs and Tourism, has engaged in a programme to rehabilitate and conserve this heritage. It was estimated that in parts of South Africa, up to half the wetlands, and the benefits they provided, had been lost in the past 40 years.

The partnership generated R18 million worth of job creation projects for the 2000/01 financial year. The money spent on the rehabilitation of wetlands will be increased to R30 million in the 2001/02 financial year. This will provide jobs, skills and opportunities for the poor and disadvantaged, and raise awareness about the wetlands.

Botanical gardens

The NBI, with its head office at Kirstenbosch National Botanical Garden in Cape Town, is an autonomous State-aided institute, which collects, displays and cultivates plants indigenous to South Africa; undertakes and promotes research into indigenous plants and related matters; studies and cultivates endangered plant species; promotes utilisation of the economic potential of indigenous plants; and runs environmental education programmes.

The NBI manages eight botanical gardens in five of the nine provinces. The largest, and the site of the Institute's headquarters, is

Kirstenbosch on the east slopes of Table Mountain in Cape Town. It houses 5 300 indigenous plant species, and was voted one of the top seven botanical gardens in the world at the International Botanical Gardens Congress in 1999.

The other gardens are: the Desert Karoo in Worcester, Harold Porter in Betty's Bay, Free State in Bloemfontein, Natal in Pietermaritzburg, Lowveld in Nelspruit, Witwatersrand in Roodepoort and the Pretoria National Botanical Garden. The latter houses the National Herbarium of South Africa, the largest in the southern hemisphere. Here research is conducted on 750 000 specimens of southern African plants, 150 000 tropical African specimens, 50 000 others from around the world and 25 000 cultivated specimens. There are also regional herbaria in Durban and at the Kirstenbosch Research Centre.

The NBI has two main libraries, the Mary Gunn Library in Pretoria and the Harry Molteno Library at Kirstenbosch, which are valuable sources for information on southern African flora and related topics.

Some municipalities have botanical gardens which are not controlled by the NBI. These include The Wilds and Melville Koppies in Johannesburg, and the Municipal Botanical Gardens in Durban.

The Johannesburg Botanical Garden owns one of the biggest collections of lithops in the world. These are found only in the southern regions of Africa.

Zoological gardens

The National Zoological Gardens of South Africa in Pretoria, or Pretoria Zoo, celebrated its centenary in October 1999. It is the only zoo in South Africa with national status and is a member of the American Zoo Association, the World Association of Zoos and Aquariums, the Pan-African Association of Zoological Gardens, Aquaria and Botanical Gardens, the International Union of Zooculturists, and the International Association of Zoo Educators.

Pretoria Zoo, considered to be one of the 10 best in the world, extends over an area of about 80 ha. In 2000, the Zoo attracted 470 183 visitors.


It has breeding centres in Potgietersrus in the Northern Province and Lichtenburg in the North-West, where especially endangered animal species are bred.

The Zoo's collection includes 650 specimens of 105 mammal species, 1 197 specimens of 166 bird species, 2 430 specimens of 215 fish species and 345 specimens of 79 reptile species. The animal collections at the two game-breeding centres include 1 500 specimens of 40 mammal species and 120 specimens of 28 bird species.

The National Zoological Gardens of South Africa undertook the creation of a zoo and animal park at the Emerald Safari Resort and Casino in Vanderbijlpark. Animal World, which comprises 314 ha consisting of a game park and zoo houses, among others, rhino, buffalo, hippo, wild dog and a variety of bird and animal species. All the animals were provided by the National Zoo and its two satellite breeding centres.

The Johannesburg Zoological Gardens, covering some 54 ha, has an animal collection which includes about 300 species represented by some 1 900 specimens. The animals are kept in open-air enclosures separated from the public by dry or water moats. The enclosures include the internationally acclaimed gorilla complex, the pachyderm section and the section for large carnivores.

Information



AngloGold opened a R7,2-million lion enclosure for the Johannesburg Zoo's three families of tawny and white lions late in 2000. The enclosure has three camps separated from one another and the public by moats, rather than fences or walls. Inside accommodation includes specially designed night rooms and cubbing areas. To ensure that the enclosure is sustainable, AngloGold has built a boardroom facility which can be let out for business functions to generate funds to maintain the enclosure and further develop the white lion breeding programme.

A camera has been mounted in the gorillas' outside enclosure and the animals can be seen moving about during the day.

Of particular interest are the African elephants, golden lion tamarins and sitatunga.

The Zoo is assisting the Wildlife Breeding Research Centre in a unique three-year project to produce disease-free buffalo by artificial insemination and *in vitro* fertilisation. The aim of the project is not only to produce disease-free animals, but also to aid in the genetic management of small populations of animals.

The Johannesburg Zoo has gained international recognition for animal-breeding programmes with numerous species, including the red panda, African wild cats and grysbok.

The Zoo has also scored a world-first by breeding an eland calf through artificial insemination. It has recently embarked on a breeding programme to help save the cheetah from extinction.

Two female Siberian tigers joined the male tiger at the Zoo. A pair of snow leopards, the only snow leopards in Africa, are also on exhibit. A pair of breeding red pandas from Australia were added to the Zoo's pandas.

Breeding centres

There are a number of breeding centres in South Africa. The National Zoological Gardens of South Africa is responsible for the management of the Lichtenburg Game Breeding Centre in the North-West, which covers an area of some 6 000 ha, and the Potgietersrus Game Breeding Centre in the Northern Province, covering an area of 1 500 ha. The main aim of the two centres is to supplement the Zoo's breeding programme for various endangered animals, and to supplement the Zoo's own animal population.

The Lichtenburg Game Breeding Centre houses, among other animals, Père David's deer, pygmy hippopotamuses, white rhino, the endangered addax, and scimitar-horned and Arabian oryx. Large herds of impala, springbok, zebra, blesbok and red hartebeest also roam the area.



About 32 ha of the wetland area in the Centre have been developed into a system of dams and pans, which serves as a natural haven for waterbirds such as spoonbills, kingfishers, ibises and herons.

The Potgietersrus Game Breeding Centre is home to an abundance of exotic and indigenous fauna such as lemurs, rare tsessebe, roan antelope, cheetah and black rhino.

The world-renowned De Wildt Cheetah Breeding and Research Centre, situated near Pretoria, is best known for its highly successful captive-breeding programme. De Wildt also breeds a number of rare and endangered African species, the most spectacular of which is the magnificent king cheetah. It also plays a major role in the breeding of the wild dog.

The Hoedspruit Research and Breeding Centre for Endangered Species in Mpumalanga is another well-known breeding centre. The Centre caters for, among other animals, five species of vulture: Cape griffins, white-backed, hooded, whiteheaded and lappet-faced vultures.

Aquaria

There are famous aquaria in Pretoria, Port Elizabeth, Cape Town and Durban.

The Aquarium and Reptile Park of the National Zoological Gardens exhibits valuable king penguins. It is the biggest inland aquarium in Africa, with the largest collection of freshwater fish. It is also the only aquarium in South Africa that exhibits a large variety of marine fish in artificial sea water.

The Port Elizabeth Oceanarium is the home of seal, dolphin and fish families indigenous to the Eastern Cape coastline. East London also has a smaller aquarium, which is worth visiting.

At the Two Oceans Aquarium situated at the Cape Town Waterfront, more than 3 000

specimens represent some 300 species of fishes, invertebrates, mammals, birds and plants supported by the waters in and around the Cape coast.

Sea World, comprising a dolphinarium and aquarium, is situated on the beach front at Marine Parade in Durban. The aquarium has a shark and reef tank with large turtles and a variety of fish, including kingfish and stingrays.

Snake parks

The Hartbeespoort Dam Snake and Animal Park on the northern shore of the Hartbeespoort Dam near Pretoria has a fine reptile collection.

The Transvaal Snake Park at Midrand, between Pretoria and Johannesburg, houses up to 150 species of snake, and other reptiles and amphibians from southern Africa and elsewhere. The emphasis is on the development of programmes for the breeding of animals in captivity.

In Durban, the Fitzsimons Snake Park houses more than 100 exotic and indigenous species of snake.

The Port Elizabeth Snake Park has a wide variety of South African and foreign reptiles, including boa constrictors, pythons, crocodiles, lizards and deadly venomous snakes such as cobras, mambas and rattlers.

The Aquarium and Reptile Park complex situated within the Pretoria Zoo houses 86 reptile species from all over the world.

Marine resources

South Africa's coastline covers some 3 000 km. Of this, only a very small portion is protected in terms of areas closed to certain activities.

Man, including but not limited to the fishing industry, poses the greatest threat to the marine environment.

The Chief Directorate: Marine and Coastal Management of the Department of Environmental Affairs and Tourism is the central government agency primarily responsible for the administration of marine fisheries in South

Information

Gerald Hinde won the Agfa Wildlife Photographer of the Year Award for 2000. His winning photograph was that of a stalking lioness, and was chosen from more than 4 000 slides from local and overseas photographers.

Africa. This includes marine research, exploitation control, formulating policy advice and managing a fleet of research ships, including the *MV SA Agulhas*. This ship also serves as a replenishment ship for the South African Antarctic base and various Southern Ocean islands.

The research component of Marine and Coastal Management advises on the utilisation of living marine resources and the conservation of marine ecosystems by interacting with decision-makers, those involved in fishing, interest groups, and the local and international scientific communities.

Inland fisheries fall under the jurisdiction of the provincial administrations or the national Department of Agriculture. Some aspects of estuarine research and management as well as all aspects of mariculture (aquaculture in the sea) fall under the control of Marine and Coastal Management.

South Africa's commercial fishery industry is valued at more than R2,5 billion annually

and employs 27 000 people directly, while recreational fishing attracts some 750 000 enthusiasts, employs over 130 000 people and generates more than R1,7 billion in revenue to direct and indirect participants each year. The subsistence sector is being evaluated and formalised, but true subsistence fisherfolk are few.

South Africa's most valuable commercial fishery is the demersal fishery, dominated by deep-sea trawling for Cape hake (hake contributes more than 65% of the deep-sea trawl catch).

The inshore trawl fishery operates along the south coast and lands only 6% of the national hake catch but almost all of the sole catch.

The midwater trawl fishery is relatively small and targets exclusively adult horse mackerel, which are also caught by the inshore and deep-sea trawlers.

The pelagic fishery is South Africa's largest in terms of volume landed. Pelagic catches fluctuate because anchovy dominated the catch from the sixties until 1996, when pilchard reassumed dominance. Used for the manufacture of fish-meal and oil, anchovy was the single most important species for 30 years, after the sixties, when over-fishing caused the pilchard stock to collapse. Round herring also makes up a significant part of the pelagic catch, and juvenile horse mackerel and lanternfish occasionally yield a few thousand tons to the purse-seine fishery.

Information

At the end of July 2001, the Minister of Environmental Affairs and Tourism announced the allocation of medium- and long-term commercial fishing rights in South Africa.

The Minister intends to allocate rights for periods of up to four years (15 years in respect of mariculture and fish processing), which will greatly enhance opportunities for investment and the promotion of stability in the fishing industry. In the case of abalone, the rights will be allocated for a period of two years only to allow the industry, together with other stakeholders and the Department, to develop a plan that will lead to better management of the resource and significantly address the issue of overexploitation and poaching.

The new application fee for a right to undertake commercial fishing is R6 000. This fee merely covers the immediate costs associated with processing the applications, assessing them and the allocation of rights. The new system also makes provision for applicants who seek a right which in quantum is below a certain level to pay an application fee of R500 only. This fee will apply to the following commercial activities:

- harvesting less than 60 000 oysters per annum
- harvesting white mussels for bait purposes
- harvesting less than 850 kg of abalone
- harvesting 1,5 t or less of west coast rock lobster
- harvesting linefish traditionally with no more than four crew members
- harvesting by means of small nets (beach seine for mixed shoal fish, drag, gill/drift, cast and shove).

Policy

The amendment to the Marine Living Resources Act, 1998 which allows for a maximum two-year extension of current fishing rights in order to facilitate the restructuring of the system of allocating fishing rights, has been signed.

The industry is complicated and conflict-ridden, which has been exacerbated by past economic and social imbalances in South Africa. Furthermore, interest in the fishing industry has increased in recent years. While 500 applications were received before 1998, more than 11 000 applicants apply for fish-



ing rights annually, placing an unbearable pressure on both the resources of the Department and those of the marine environment.

So-called 'paper' and 'cardboard' quota holders will be systematically weeded out of the system. This will give greater opportunities to genuine fisherfolk and especially coastal communities whose livelihood depends on these resources for survival and poverty alleviation.

Further measures, including tax compliancy and significant increases of fisheries compliance officers, will also be introduced in 2002.

The following core issues are addressed in the regulatory framework:

- Establishing a dedicated Rights Allocation Unit. This will deal with the question of capacity of the Department to service the industry more efficiently.
- Issuing of long-term rights (instead of annual renewal of rights) for all species by the year 2002. This will boost confidence in the industry, and is an important building-block for stability and crucial for new entrants who can only acquire credit if longer-term rights are issued.
- Rooting out malpractices in the industry through a verification unit. The unit will cross-check the veracity of applications to unmask fictitious claims and companies, fraudulent conduct fronts and other related issues. Offenders will be prosecuted and/or disqualified from taking part in the industry.
- Establishing a proper fee structure for the payment of rights. A new revenue system

will introduce a fee structure concomitant with the value of the catch and also take into account the size of the participant.

- Moving the industry towards greater self-regulation and co-management. The vision is a scenario where the industry participates in both setting the criteria for rights allocation and participating in the awarding of such rights within an approved structure.
- Implementing a new management model for subsistence and artisanal fisheries. The vision is for a decentralised system that relies more on co-management.

A Subsistence Fisheries Task Group was commissioned to undertake a comprehensive nation-wide study of the subsistence fisheries to provide recommendations for the management of this sector. Some of the recommendations of this task team have already been implemented. This includes establishing a dedicated Subsistence Fisheries Management Unit, convening a subsistence fisheries resource, and the appointment of regional/provincial extension staff structures.

Staff will effect liaison with fishing communities; handle permit application, verification and issue; monitor compliance; and facilitate relevant research.

Primary objectives of the Government's fisheries policy are the upliftment of impoverished coastal communities through improved access to marine resources and the sustainable management of those resources. The Marine Living Resources Act, 1998 provides for the conservation of the marine ecosystem, the long-term sustainable utilisation of marine living resources, and the protection of and orderly access to exploitation of certain such resources.

The Act states that no fishing whatsoever is allowed without a permit. Licences are required for commercial fishing by subsistence and recreational fisherfolk and mariculture entrepreneurs. Commercial fishing is subject to allowable catches or quotas. The Act also gives powers to fishery control officers to act beyond South African waters, in accordance with international law. Fines of up

Information

According to the *Marine Biodiversity Status Report*, compiled by the National Research Foundation in conjunction with Marine and Coastal Management and the South Africa Network for Coastal and Oceanic Research, the South African coastline and marine resources have been degraded by development, poaching and over-fishing to such an extent that some marine species may never recover. The Report, released in September 2000, says that excessive and increasing exploitation of keystone species by sophisticated industrial, recreational and subsistence users has resulted in radical and perhaps irreversible changes.

to R5 million for transgressors are provided for, and any person convicted of an offence could have his or her fishing and transport equipment seized.

The Act provides for the establishment of the Consultative Advisory Forum for Marine Living Resources to advise the Minister of Environmental Affairs and Tourism on matters such as total allowable catch (TAC), resource management and legislation and administration of the marine living resources fund (a fund contributed to by users of the resources dedicated to supporting marine fisheries management). Provision is also made for a system whereby fisherfolk are invited to apply for and obtain long-term transferable rights to catch quota species such as hake, abalone and rock lobster. In future, such rights might be extended to species not managed by a quota system, such as some species of line fish. Quotas bought will then likely be a percentage of the TAC, which will be set for each year. Existing companies will have to apply for rights, which will also be open to new and previously disadvantaged companies and fisherfolk who can prove that they can develop fishing capacity or who have contributed to the industry.

Information

Between August 2000 and April 2001, 900 persons were arrested, 68 701 abalone worth R8 million confiscated, 13 030 rock lobster confiscated, R121 000 in spot fines issued, and 39 vehicles confiscated.

Information

The South African and Norwegian governments committed themselves to co-operation in the marine fisheries sector by signing a business plan in November 2000. The business plan intends to ensure the enhancement of effective research and management related to marine fisheries and mariculture. Aspects addressed in the business plan relate to six projects, namely:

- mariculture sectoral development assistance
- scientific capacity-building
- scholarship and training
- fisheries management and sector development support (fishing rights allocation process)
- legislation development for fisheries
- subsistence fisheries management.

This project was to be funded to a tune of about R10,6 million for 2000 to 2001.

The Minister of Environmental Affairs and Tourism is developing strict controls for the subsistence and recreational fishing sectors. The plan to assist subsistence fisherfolk includes the setting aside of tonnages within the TACs and allocation of subsistence permits for rock lobster and abalone. The latter are allocated to appropriate impoverished fisherfolk who are entitled to catch and sell either or both of four rock lobster or four abalone a day during specified seasons. Recreational permits for both seasons are now strictly curtailed and controlled. The daily bag limit for recreational fishers remains the same, provided fishers are in possession of a valid permit.

The Government follows a strict conservation policy in a fisheries zone of 200 square nautical miles.

The only foreign vessels licensed to fish off the South African coast are Japanese and Taiwanese tuna boats. South Africa also has a bilateral agreement with Mozambique where, through joint ventures, Mozambican fisherfolk may benefit from 1 000 t of South African hake in exchange for allowing modest exploitation of prawns in Mozambican waters. The agreements with foreign countries are subject to occasional renegotiation.

The Maritime Zones Act, 1994 (Act 15 of 1994), gives South Africa the rights over internal and territorial waters, contiguous and exclusive economic zones (EEZs) and the continental shelf of the sea within a specific zone. Around Marion Island there are 213 000 square nautical miles of territorial waters, an additional 234 000 square nautical miles of contiguous zone, 320 000 square nautical miles of EEZ and a further 603 000 square nautical miles of continental shelf.

False Bay in the Western Cape is an example of internal and territorial waters, as are the areas inshore between Cape Deseada north of St Helena Bay and Bird Island in Algoa Bay.

This is where South Africa has total sovereignty, but innocent passage by foreign ships is allowed. In the contiguous zone, South Africa has rights to national legislation



regarding customs, immigration, emigration, and sanitary and fiscal matters. In the EEZ and on the continental shelf, South Africa may explore, exploit and protect resources found in the sea.

A partnership between the South African Network for Coastal and Oceanic Research, the National Research Foundation and the Department of Environmental Affairs and Tourism develops, coordinates and funds a large and applied research programme to acquire information appropriate for marine and coastal resource management.

Fishery sectors

In the pelagic fishery, anchovy and pilchard catches are limited by quota and they, plus catches of round herring, are mainly processed into fish-meal, fish body oil and canned fish.

The major purse-seine fishing areas are near Walker Bay and St Helena Bay, up to 25 km offshore. Because of the high local demand for fish-meal and the small catches of canning fish (for which the biggest market is local), this branch of the industry exports very small quantities at present.

Economically, demersal fishing remains the dominant fishery, with hake constituting on average more than 65% of landings. Hake catches in offshore and midwater trawls, and hake and sole catches in inshore trawls, are however, regulated by quota.

Hake was traditionally caught using large bottom trawlers off the west coast and over the Agulhas Bank off the Western Cape, but international trends towards the payment of higher prices for line-caught hake prompted the Government to give the go-ahead for the establishment of a small hake long-line fishery in June 1998. Some 15 000 t of the hake TAC of just over 155 000 t for 2000 was caught by the long-line method.


About 90% of the annual catch of commercial rock lobsters is exported. The minimum size of rock lobster is a carapace length of 75 mm.

South Africa's commercial abalone fishery remained relatively stable for many years, at a whole mass quota of some 600 t. Regrettably, environmental changes, as well as a large increase in poaching activity, have lowered stock levels, and TACs have recently been severely reduced. There are seven fishing zones, with a TAC set for each zone.

The catching of squid (*Loligo vulgaris reynaudii*) by the jigger method off the Cape South Coast began in 1983 and peaked in 1989 at nearly 9 800 t. Important line-fishing species include snoek (*Thysites atun*), kob (*Argyrosomus* spp.), silverfish (*Argyrozona argyrozona*), geelbek (*Atractoscion aequidens*), yellowtail (*Seriola lalandi*) and hottentot (*Pachymetopon blochii*).

The South African Bureau of Standards maintains compulsory standards for the seafood processing industry, while the Fishing Industry Research Institute (part of the Council for Scientific and Industrial Research's FoodTech) does research on processing technology. Besides the commercial line-fishers, some 500 000 recreational anglers fish from the shore and small craft. They are barred from selling their catches. In terms of the Marine Living Resources Act, 1998, they have to be registered and licensed. The linefish


Information



On 23 June 2000, the bulk ore carrier *MV Treasure* sank off the western coast of South Africa and Dassen and Robben islands, which supports the largest and third-largest colonies of African penguins (*Spheniscus demersus*). As a result, more than 19 000 penguins were oiled, almost twice the previous highest number of seabirds oiled during a single event in southern Africa (10 000 penguins after the sinking of the *Apollo Sea* in June 1994). About 150 oiled adults died in the wild. Some 19 500 penguins were relocated to Port Elizabeth, 800 km to the east, to remove them from oil-affected waters. Of all penguins caught, which amounted to 20% of the total species population, less than 2 000 died within the first month, considerably less than in the 1994 spill.

It is considered the world's largest ever rescue of any seabirds from an oiling event.

Information



In May 2001, Walker Bay in Hermanus, Western Cape, was declared South Africa's first whale sanctuary. The use of private boats and jet-skis in the Bay is strictly prohibited.

resources are further protected by size restrictions as well as bag limits, and a linefish management protocol has been developed in an attempt to stimulate recovery of the stocks, most of which are overexploited and/or have

collapsed. A total ban has been placed on the catching of the great white shark, the Natal wrasse, and the potato and brindle bass.

Other exploited renewable resources along the South African coast include prawns, lan-

Multilateral agreements and treaties concerning environmental affairs to which South Africa is party

- Convention Relative to the Preservation of Fauna and Flora in Their Natural State, 8 November 1933 (London)
- International Convention for the Regulation of Whaling (as amended), 2 December 1946 (Washington)
- Convention of the World Meteorological Organisation with Related Protocols, 6 March 1947 (Washington)
- Convention on the International Maritime Organisation, 6 March 1948 (Geneva)
- International Plant Protection Convention, 6 December 1951 (Rome)
- Convention on the Territorial Sea and Contiguous Zone, 29 April 1958 (Geneva)
- Convention on the Continental Shelf, 29 April 1958 (Geneva)
- Convention on Fishing and Conservation of the Living Resources of the High Seas, 29 April 1958 (Geneva)
- Convention on the High Seas, 29 April 1958 (Geneva)
- The Antarctic Treaty, 1 December 1959 (Washington)
- International Convention on the Protection of New Varieties of Plants, 2 December 1961 (Paris)
- Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water, 5 August 1963 (Moscow)
- Agreement Concerning Rivers of Mutual Interest between Portugal (Mozambique), Swaziland and the Republic of South Africa, 13 October 1964
- International Convention for the Conservation of Atlantic Tunas, 14 May 1966 (Rio de Janeiro)
- Treaty on the Non-Proliferation of Nuclear Weapons, 1 July 1968 (Washington, London, Moscow)
- Convention on the Conservation of the Living Resources of the South-east Atlantic, 23 October 1969 (Rome)
- International Convention on Civil Liability for Oil Pollution Damage, 29 November 1969 (Brussels)
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 29 November 1969 (Brussels)
- Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and the Ocean Floor and in the Subsoil Thereof, 11 January 1971 (London, Moscow, Washington)
- Convention on Wetlands of International Importance especially as Waterfowl Habitat, 2 February 1971 (Ramsar)
- Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxic Weapons and their Destruction, 10 April 1972 (London, Moscow, Washington)
- Convention on the Conservation of Antarctic Seals, 1 June 1972 (London)
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 29 December 1972 (London, Mexico, Moscow, Washington)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora, March 1973 (Washington)
- International Convention for the Prevention of Pollution from Ships, 2 November 1973 (London)
- Safety of Life at Sea Convention (Solas), 1974 (Sections applicable to meteorology)
- Convention on the International Maritime Satellite Organisation plus Operating Agreement, 3 September 1976 (London)
- Convention on the Conservation of Migratory Species of Wild Animals, 1979 (Bonn)
- Convention on the Conservation of Antarctic Marine Living Resources, 20 May 1980 (Canberra)
- Protocol to Amend the Convention on Wetlands of International Importance especially as Waterfowl Habitat, 3 December 1982 (Paris)
- Convention for the Protection of the Ozone Layer, 22 March 1985 (Vienna)
- Convention on Early Notification of a Nuclear Accident, 26 September 1986 (Vienna)
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, 26 September 1986 (Vienna)
- Protocol on Substances that Deplete the Ozone Layer, 16 September 1987 (Montreal)
- Protocol on Environmental Protection to the Antarctic Treaty, 4 October 1991 (Madrid)
- Convention on Biological Diversity, 11 June 1992 (Rio de Janeiro)
- Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, 13 January 1993 (Paris)
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 3 August 1994
- United Nations Framework Convention on Climate Change, 21 March 1994
- Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, June 1994 (Paris)
- United Nations Convention on the Law of the Sea, 23 December 1997 (Montego Bay)
- World Heritage Convention, July 1997



goustine (*Nephrops andamanicus*), red crab (*Chaceon* spp.), mullet (*Liza richardsoni*), elephant fish (*Callorhinchus capensis*), oyster (*Crassostrea margaritacea*), mussels (*Donax*, *Mytilus*, *Choromytilus*, *Perna*), red-bait (*Pyura stolonifera*), sea-bird guano gathered from islands and artificial platforms, and several different types of seaweed.

For decades, mariculture in South Africa was confined to oyster-farming at Knysna. However, black mussels (*Mytilus galloprovincialis*) are now grown in Saldanha Bay.

Interest in mariculture has increased in recent years, and permits have been granted for the farming of abalone, prawns and seaweed. There is also serious interest in certain fin fish species.

Since 1998, the number of permitted mariculture establishments has grown from 19 to 40. Over the next year it will grow by a further 20. The first permit for the establishment of a salmon farm was expected to be issued in June 2001.

South Africa, a member of the International Whaling Commission, has not done any whaling since 1975, and does not regard it as ethically acceptable to kill whales for commercial purposes. For this reason, it has agreed to the retention of the moratorium on whaling, which was introduced in 1982. South Africa also voted in favour of establishing the Southern Ocean Whale Sanctuary, which links up with the existing sanctuary in the Indian Ocean to provide protection for whales over a larger area.

Southern Africa has a population of between 1,5 and two million fur seals (*Arctocephalus pusillus pusillus*). No sealing has taken place since 1989 because of worldwide opposition to the utilisation of wild mammals in the fur trade, and to sealing methods.

Fishing methods

Fishing methods include purse-seining (pelagic shoaling fish); bottom and mid-water trawling (demersal fish and shrimps); hoopnet and trap fishing (rock lobsters); hand-lining (various line-caught fish); long-lining and Madeira pole-fishing (tuna); jigging (squid);

beach-seining; set and stake-netting (mullet and other migratory coastal fish); diving (abalone); and collecting, harvesting and cultivating (seaweed, guano, oysters, mussels and abalone).

Harbours

The Chief Directorate: Marine and Coastal Management supervises harbour facilities and provides marine conservation inspectors at 12 proclaimed fishing harbours. These are Lambert's Bay, the mouth of the Berg River, St Helena Bay, Saldanha Bay, Hout Bay, Kalk Bay, Gordon's Bay, Hermanus, Gans Bay, Struis Bay, Arniston and Still Bay. Other harbours such as Port Nolloth, Cape Town, Mossel Bay, Knysna, Port Elizabeth, East London and Durban are also used. Most of this latter group are controlled by Portnet, a division of Transnet. (See Chapter: *Transport*.)

Fleet

In 2000, the commercial fishing fleet consisted of 4 477 vessels, licensed by the Department of Environmental Affairs and Tourism. These included 315 craft larger than 20 m, 383 between 12 m and 19,9 m, 255 between 8 m and 11,9 m, 1 613 between 5 m and 7,9 m, and 1 911 craft smaller than 4,9 m.

Line-fishing vessels are divided into two classes: commercial (class A) and semi-commercial (class B). In 2000, class A permits were issued to 417 vessels and class B permits to 2 314.

A total of 480 tuna permits was issued to 5 150 fisherfolk. The squid-jigging fishery had 183 catchers and a further 154 craft that could both catch and process.

Owners of vessels have to apply for licences each year and also obtain a permit for each fishing sector in which they are active.

Conservation challenges

South Africa faces many of the problems experienced by developing countries in which rapid industrialisation, population growth and urbanisation pose a threat to the quality of the environment.

The Department is reforming environmental law to introduce reforms in biodiversity conservation, pollution, waste management and environmental planning.

Climatic and atmospheric change

According to the *State of the Environment Report*, South Africa is sensitive to climate change, and contributed about 1,2% to global warming in 1990.

The levels of sulphur dioxide, nitric oxide and ozone are on average within the accepted South African guidelines for human health and the prevention of direct ecosystem damage. The measured concentrations at ground level are not currently showing an upward trend.

The Report states that there are occasions, especially in the major urban areas, when the concentrations of sulphur dioxide, nitric oxide, ozone and smoke particles could lead to further health problems in people who are already experiencing respiratory problems. No trend is apparent in the number of times these levels are exceeded, but with more people living in urban areas, the impact is likely to increase.

Indoor air quality constitutes a health hazard in poorly ventilated dwellings without chimneys, where coal, wood, paraffin or dung are used as fuel. The electrification of

houses will improve this situation, as will the general improvement in housing design and construction brought about by the national housing policy.

According to the Report, susceptible terrestrial and freshwater ecosystems are likely to show adverse effects of acid deposition in a few decades if the current emission rates of sulphur dioxide and nitric oxide are continued or increased.

Erosion and desertification

Most of South Africa's soils are unstable. The country loses an estimated 500 million t of topsoil annually through erosion caused by water and wind.

Approximately 81% of the total land area of South Africa is farmed. Only 70% of this area is suitable for grazing. Overgrazing and erosion diminish the carrying capacity of the veld and also lead to land degradation. This process has already claimed more than 250 000 ha of land in South Africa.

The Department of Agriculture administers the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983), in terms of which various measures are implemented to prevent or contain soil erosion.

In January 1995, South Africa signed the Convention to Combat Desertification, which was ratified on 30 September 1997. The main objectives of the Convention include co-operation between governments, organisations and communities to accomplish sustainable development, especially where water resources are scarce. The Convention aims to support member countries in Africa to prevent desertification and all its consequences. These countries support one another at technical and scientific level as they share similar climatic conditions. South Africa also acts as coordinator for the Valdivia Group for Desertification. The Group consists of countries in the southern hemisphere, namely Australia, New Zealand, Argentina, Chile, Uruguay, South Africa and Brazil, whose aim it is, *inter alia*, to foster scientific and technological co-operation.

Information

In January 2001, Cape Town hosted an international conference on the conservation of seabirds threatened by long-line fishing. Over 50 delegates and observers from 17 countries attended the seven-day gathering, which was sponsored by the governments of South Africa, Australia, New Zealand and the United Kingdom. Birdlife International scientists fear that up to 26 species of albatross and petrel may be in danger of extinction unless firm steps are taken to reverse the destructive effects of long-line fishing.

The Agreement on the Conservation of Albatrosses and Petrels was finalised in early February 2001. The Agreement, which includes an action plan, describes a number of conservation measures to be implemented by signatories to the proposed Agreement. These include research and monitoring, reduction of incidental mortality in fisheries, eradication of non-native species at breeding sites (especially introduced predators such as rats and cats), reduction of disturbance and habitat loss, and reducing pollution.



Pollution control and waste management

According to the *State of the Environment Report*, more than 42 million m³ of general waste is generated every year across the country, with the largest proportion coming from Gauteng (42%). In addition, more than 5 million m² of hazardous waste is produced every year, mostly in Mpumalanga and KwaZulu-Natal (owing to the concentration of mining activities and fertiliser production in these provinces). The average amount of waste generated per person per day in South Africa is 0,7 kg.

According to a recent study investigating the disposal sites for general and hazardous wastes in South Africa, there are 730 existing and future landfill sites across the country. Of these, 49 are closed, 638 are operating and 43 are proposed for the future.

Many of them still require permits, since only 394 permits have been issued. All the

commercial hazardous sites and approximately 95% of the general large sandfill sites are, however, issued with permits under Section 20 (1) of the Environmental Conservation Act, 1989 (Act 73 of 1989). The Department of Water Affairs and Forestry is publishing directions to deal with the backlog of small waste disposal facilities. During 2000, the Ministry of Environmental Affairs and Tourism decided that the Department of Water Affairs and Forestry would remain the landfill permitting authority.

At the current rate of disposal, it is predicted that over the next five years the generation of waste will exceed landfill capacity in five of the nine provinces, by up to 67%.

By far the biggest contributor to the solid waste stream is mining waste (72,3%), followed by pulverised fuel ash (6,7%), agricultural waste (6,1%), urban waste (4,5%) and sewage sludge (3,6%). These high volumes of waste and pollution are cause for concern.

However, what is alarming is the proportion of waste (particularly hazardous waste) that does not receive proper treatment or disposal.

The *White Paper on Integrated Pollution and Waste Management for South Africa* was approved for publication by the Cabinet in February 2000. The policy represents a paradigm shift towards

- prevention and minimisation of waste and pollution at source
- management and minimisation of the impacts of unavoidable waste from its generation to its disposal
- ensuring the integrity and sustained 'fitness for use' of all environmental media (i.e. air, water and land)
- remediation of any pollution of the environment by holding responsible parties accountable
- integration of environmental, social, political and development needs, and the rights of all sectors, communities and individuals.

The goals and objectives of the policy will be implemented through the National Waste Management Strategy, under the auspices of the departments of Environmental Affairs and Tourism and Water Affairs and Forestry.

Information

Delegates from more than 120 countries reached an agreement on the text of a Toxic Chemicals Treaty to curb or ban some of the world's most dangerous pollutants at a meeting in Johannesburg in December 2000. The talks, held under the auspices of the United Nations Environment Programme (UNEP), were the fifth round on the banning of persistent organic pollutants (POPs), 12 of which have been singled out for urgent attention. The Treaty sets out to control measures covering the production, import, export, disposal and use of POPs. An exemption has been granted for DDT, which South Africa and about 25 other countries need for the fight against malaria.

Information

The National Waste Summit was held in the Northern Province at the end of September 2001. The Summit was one of the implementation processes of the National Waste Management Strategy for sustainable development in terms of the *White Paper Policy on Integrated Pollution and Waste Management for South Africa*. The Strategy presents a long-term plan for addressing key issues, needs and problems experienced with waste management in South Africa.

The Summit provided a platform for showcasing government's best practices in waste management as part of a broader awareness and capacity-building initiative.

The Strategy sets action plans, time frames and targets. It is developing hazardous waste information systems and records, and developing mechanisms to promote cleaner technologies. Legislation to implement the White Paper will be phased in over the next three years.

Clean and Green programme

This community-based waste management programme is implemented by the Department of Public Works in partnership with South African Breweries. Small, medium and macro enterprises are contracted to provide clean-ups in areas where no formal refuse removal exists. Clean and Green is a labour-intensive waste management and environmental awareness programme aimed at creating jobs and building local capacity. A total of 454 people were employed in 2000/01.

Water quality management

The management of the quality of the national water resources of South Africa is the responsibility of the Directorate: Water Quality Management of the Department of Water Affairs and Forestry.

Water quality and water resource management in South Africa is increasingly faced with new challenges to protect and manage the country's limited water resources against pollution and overexploitation owing to population growth. There is also the evolution of the South African society and the imperatives for equity of access to water. These challenges served as the driving force behind the water

law reform process, which culminated in the National Water Act, 1998 (Act 36 of 1998).

The Directorate is developing new water quality policies and implementing various regulatory instruments stipulated by the Act to face up to these new challenges.

The National Water Act, 1998 further enables the Department to manage water quality through both source-directed and resource-directed measures. Source-directed measures include the demonstration by potential polluters that they have considered waste minimisation, re-use and recycling before disposal. The Act makes provision for licences for disposal of waste onto land. Duplication with other legislation is prevented through a dispensing clause in Section 22(3) of the Act. It aims at cleaner technology and not only to improve methods of disposal of waste and effluent.


The Act requires that all water resources be classified into four classes. Resource quality objectives must then be set for each class. These include objectives for the instream, riparian habitat and aquatic biota water quality and quantity.

The Department of Water Affairs and Forestry, in partnership with the Department of Environmental Affairs and Tourism, contributed to the completion of the Integrated Pollution Control and Waste Management Policy and the National Waste Management Strategy. It focused specifically on its water quality responsibilities within an integrated pollution control policy model. (See Chapter: *Water Affairs and Forestry*.)

Marine pollution

More than 80% of marine pollution comes from land-based sources such as pipeline discharges, rivers and stormwater runoff. There are 63 pipelines along the coastline, discharging some 800 million litres of effluent per day.

Such effluents include both raw and treated sewage, industrial effluents, and, in many cases, a mixture of the two. In the past, many of these discharges were into the surf zone, or even onto the shore, but the current ten-



Information

According to the UNEP, nearly one billion people in urban areas around the world, including millions in South Africa, breathe air with unacceptable levels of pollution. However, an intensive field study by more than 200 scientists, including ones from Wits University, is expected to contribute to a better understanding of air pollution and its impact on climate change. The study, over a three-year period, known as the Southern African Regional Science Initiative (Safari 2000), was launched in 2000 to look into the complex interaction of air pollution and ecosystems in South Africa, Botswana, Namibia, Zimbabwe, Malawi, Zambia, Lesotho, Mozambique and Swaziland.



gency is to extend the pipelines further offshore. Pipelines operate under permits issued by the Department of Water Affairs and Forestry. Permit conditions generally include the monitoring of adverse effects of such discharges on the marine environment.

An increasing source of concern is non-point source pollution, especially that coming from the burgeoning informal settlements that form part of many coastal cities. Such pollution is generally the result of inadequate sanitation and other infrastructure, and is very difficult to control or monitor.

Shipping also contributes significantly to marine pollution, particularly with regard to specific types of pollutants. For example, of the estimated 6,1 million metric tonnes of oil entering the oceans every year, some 45% comes from shipping activities.

The balance comes from industrial discharges, urban runoff and oil exploration and

production – the latter only 2%. Of that emanating from shipping activities, the majority comes from vessel operations, with only 12% from tanker accidents. Nevertheless, due to the notorious sea conditions along its coastline, South Africa has experienced a number of major oil spills, and, as a consequence, has a well-developed response capability. This includes contingency plans, salvage tugs, dispersant spraying vessels, a reconnaissance aircraft, and a stockpile of oil spill response equipment.

Other pollutants linked to the operational activities of ships include sewage and garbage, ballast water discharges, air pollution, and cargoes which reach the sea as a result of accidents. Sewage, garbage and air pollution are regulated by annexes to MARPOL, an international convention controlling pollution from ships, to which South Africa is a party. New regulations to control ballast water discharges are being developed. The major concern is the translocation of alien species, including pathogens, which may have not only ecological, but also social (public health) and economic consequences. South Africa is involved in an international project aimed at implementing international guidelines on ballast water management in developing countries.

Cargoes range from foodstuffs such as rice and maize, to crude oil, toxic waste and plutonium. Another potential source of marine pollution is the dumping of waste at sea. This activity is regulated under the Dumping at Sea Control Act, 1980 (Act 73 of 1980), and, since 1995, excludes industrial waste. The main categories of waste which are dumped in South Africa are dredged material from the ports, obsolete vessels and, occasionally, spoiled cargoes.

The Department of Environmental Affairs and Tourism appointed a rapid-reaction unit in November 2000 to manage environmental accidents such as spills of hazardous chemicals and pollution from ships. The unit will be required to perform clean-up tasks at short notice to minimise the effect of hazardous spills.

Information

As the closing event of Marine Week 2000, run annually by the Department of Environmental Affairs and Tourism, three hikers, Derek Brown, Robbie Dyer and Raymond Ngubane of the Wildlife and Environment Society of South Africa started a 3 300-km coastal hike (from Kosi Bay on the Indian Ocean to the mouth of the Orange River on the Atlantic coast).

Our coast for life was the theme for National Marine Week, which ran from 16 to 20 October 2000.

Over a seven-month period, the hikers promoted coastal awareness through public participation and media coverage. They visited some of the R14-million Coast Care projects that were launched by the Minister as well as the pilot Blue Flag beach projects at Sodwana, Ballito, Durban (South Beach), Margate (Main Beach), East London (Orient), Port Alfred (Kelly's), Port Elizabeth (Humewood), Jeffreys Bay (Main), Plettenberg Bay (Lookout), Hermanus, South Peninsula (Fish Hoek and Muizenberg) and Cape Town (Strandfontein, Camps Bay and Sea Point).

In June 2001, the Minister of Environmental Affairs and Tourism announced that the 20th General Assembly of the Foundation for Environmental Education allowed South Africa to become an official member country. This enables South Africa to fly the international Blue Flag at environmentally qualifying beaches. The Blue Flag will be managed by the Wildlife and Environment Society of South Africa. The Blue Flag is a well-known quality brand for beaches all over Europe, and tourists choose these as choice holiday destinations as they are ensured of quality standards for bathing water, safety, amenities, access and many other international Blue Flag criteria, offering them a quality visit.

Coastal management

The Department of Environmental Affairs and Tourism's Subdirectorates: Coastal Zone Management is the lead agent for coastal management. This requires empowering coastal users, decision-makers and the people to sustain and manage the coastal zone and its resources appropriately.

The *White Paper on Coastal Management* was launched in June 2000. According to the White Paper, which was thoroughly researched by the Department of Environmental Affairs and Tourism over the last few years, the coast has been a driving force in the national economy. Its products account for about 35% of the country's national gross domestic product, and it has an enormous future development potential.

A number of far-reaching initiatives were undertaken.

These include the

- banning of private vehicles on South African beaches. Draft regulations aimed at prohibiting the driving of 4 by 4 and other private vehicles on beaches were published for comment in May 2001.
- removal/bulldozing of illegal cottages on the Wild Coast.
- declaration of a Whale Sanctuary in Hermanus.
- restructuring of the fishing rights dispensation to control the exploitation of coastal and marine resources.

These measures will supplement the illustrious programme of action already anticipated in the White Paper. Elements of this programme and projects include the following:

- diversifying coastal economies and optimising benefits for local coastal communities
- promoting coastal tourism, leisure and recreational development
- establishing 'one-stop-shops' for development approvals
- improving public access to the coast and coastal resources
- developing ports and harbours
- improving coordination and integration of coastal and marine resource management

- improving coordination of monitoring and the management of coastal pollution
- rehabilitating degraded coastal areas and resources.

The Government will spend R30 million of poverty relief funds on developmental coastal care projects. The projects, which will employ close to 2 000 people, will cover areas such as the management of pollution, the cultivation of subsistence food resources, estuary management, tourism and small-enterprise development.

People employed in the various projects will be involved in clean-up, security and information services. Projects would offer a variety of services ranging from upgrading and maintaining recreational beaches to providing tourism accommodation.

The biggest amount, R14,6 million, went to a project called Coastcare, which was launched in Cape Town's Kommetjie area in October 2000 and will employ at least 1 000 people during its life cycle. Coastcare, which will be coordinated nationally by the Department, will focus on tourism and pollution control. It aims to

- promote optimum awareness of the coastal zone so that its resources can be managed and developed in a sustainable way
- play a dynamic role in the exchange of information amongst all interested parties
- form a bridge of communication between scientists and other role-players
- facilitate the education of the country's diverse coastal communities through projects and training courses
- coordinate relevant associated projects to promote consistency and integration on a national level.

A R2,8-million project, the Buffeljags Sustainable Coastal Livelihood Project was also launched in October 2000. The Buffeljags project

- is a livelihood diversification project
- will develop a resource management plan with communities
- identifies business developments in the fields of tourism, weaving, craftwork, etc.
- immediately created 96 jobs.



Hazardous materials

Hazardous waste includes a wide spectrum of materials with dangerous, explosive, flammable, reactive and toxic characteristics.

South Africa generates less than half a percentage point of the world's total hazardous waste production of about 400 Mt a year. Of the 5 million m³ of hazardous waste generated every year, less than 5% reaches hazardous waste disposal sites. Furthermore, the rate of increase in production of hazardous waste is estimated to be 2,6% per annum over the next 10 years.

There are eight hazardous waste disposal sites in South Africa. Because of public pressure, no further sites have been established since 1992.

The Department of Water Affairs and Forestry has established environmental monitoring committees at hazardous waste disposal sites, which include the relevant authorities, non-governmental organisations (NGOs) and representatives of local communities.

The committees assist the Department with the monitoring of the sites and in ensuring their acceptable operation.

Hazardous substances, which are extensively used in agriculture and industry, are controlled mainly by the departments of Agriculture and Health.

Pesticides are controlled in terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).

There are regulations for the sale and compulsory registration of veterinary remedies as well as for agricultural remedies, while certain standards are set for pesticide residues on export fruit.

Recycling

Almost every type of paper produced in South Africa has a recycled content. Each ton of waste paper recycled saves about 17 pine trees, and a ton of recycled paper saves 3 m³ of landfill space, meaning that South Africa saves 10 million trees annually.

South Africa follows the United States and Japan as the best collectors of used metal

beverage cans in the world. The recovery rate of steel beverage cans sold in South Africa has grown to 63%.

A major role in this regard has been played by the Collect-a-can project, which was founded in 1993 to reduce litter and optimise the recovery of steel beverage cans. In the process, informal employment has been created for an estimated 30 000 people.

In comparison with other countries, South Africa has a high returnable glass-container market: 33% of all glass containers produced are returnable or reusable, and these are also recycled.

Urban conservation

Rapid urbanisation and its concomitant environmental impact is posing serious challenges for South African planners and environmentalists.

Up to 16 000 ha of farmland is lost to urban development each year. Low-density urban sprawl and the rapid growth of informal settlements contribute to increasing competition between urban land-users for diminishing space and resources.

As a result, informal settlements frequently develop on marginal and environmentally sensitive land, posing serious threats to human well-being and to ecosystems.

Environmentally friendly use and development of land can be promoted through official planning processes such as integrated development plans and land development objectives.

New planning and environmental legislation make better provision for environmental concerns in urban planning and development. Regulations making environmental impact assessments compulsory for certain planned developments were promulgated in September 1997.

International co-operation

South Africa is a signatory to a variety of international agreements dealing with environmental issues.

In September 1998, the National Assem-

bly's environment committee approved CITES, paving the way for the promulgation of new legislation to control South Africa's wildlife products industry.

South Africa has been a party to CITES since 1975, but it had never been approved by Parliament.

At the 11th Conference of the Parties (COP) of CITES in Nairobi in April 2000, South Africa's African elephant population was downlisted from Appendix I to Appendix II. Appendix I prohibits all forms of trade.

South Africa views the African elephant, with populations of more than 200 000 in southern African countries, as not endangered. The immediate effect of the decision is that South Africa will be able to sell elephant hides and leather goods, as well as trade in live animals.

All four Southern African Development Community countries (Botswana, Namibia, Zimbabwe and South Africa) withdrew their proposals to sell ivory stocks. South Africa now has an Appendix II listing and a zero quota for ivory. This means that at future COPs, South Africa would not have to campaign for a downlisting but rather an amendment to request a quota.

The issue at stake for South Africa is not just ivory. It is about the sustainable use of

natural resources and its use for poverty alleviation in rural areas.

The agreement on the downlisting of the African elephant would be restricted to the stockpile in the Kruger National Park.

Private-sector involvement

Numerous private bodies are involved in conservation activities. There are more than 400 organisations concentrating on conservation, wildlife and the general environment, and more than 30 botanical and horticultural organisations in the country. Among these are:

- BirdLife South Africa
- Wildlife and Environment Society
- WWF South Africa
- The Green Trust
- Earthlife Africa
- Endangered Wildlife Trust
- Wilderness Trust of Southern Africa
- Environmental Justice Networking Forum
- Dolphin Action Protection Group
- Keep South Africa Beautiful
- Trees and Food for Africa
- South African National Foundation for the Conservation of Coastal Birds
- Rhino and Elephant Foundation
- EcoLink.

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Department of Environmental Affairs and Tourism
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Suggested reading

African Wildlife and Livelihoods: The Promise and Performance of Community Conservation. Editors D. Hulme and M. Murphee. Cape Town: David Philip, 2001.
Bethlehem, L. and Goldblatt, M. *The Bottom Line: Industry and the Environment in South Africa*. Rondebosch: University of Cape Town Press, 1997.
Clarke, J. *Back to Earth. South Africa's Environmental Challenges*. Halfway House: Southern Book Publishers, 1991.



- Ecology and Empire: Environmental history of settler societies.* Editors: T. Griffiths and L. Robin. Pietermaritzburg: University of Natal Press and Keele University Press, 1997.
- Environmental Potential Atlas for South Africa.* Editors: W. van der Riet and others. Pretoria: Van Schaik for the Department of Environmental Affairs and Tourism, 1997.
- Environmental Management in South Africa.* Editors: R.F. Fuggle and M.A. Rabie. Rev. ed. Cape Town: Juta, 1996.
- Fuggle, R.F. and Rabie M.A. *Environmental Management in South Africa.* Cape Town: Juta, 1992.
- Going Green: People, Politics and the Environment in South Africa.* Editors: J. Cock and E. Koch. Cape Town: Oxford University Press, 1991.
- Hosking, S. *Exploring the Case for Increasing Glass Recycling Through Regulation.* Pretoria: Human Sciences Research Council, 2000.
- Koch, E. and others. *Water, Waste and Wildlife: The Politics of Ecology in South Africa.* Johannesburg: Penguin, 1990.
- Kok, P. and Pietersen, J. *Biodiversity.* Pretoria: Human Sciences Research Council, 2000. (National Research and Technology Foresight Project).
- Kok, P. and Pietersen, J. *Environmental management.* Pretoria: Human Sciences Research Council, 2000. (National Research and Technology Foresight Project).
- Nürnbergger, K. *Prosperity, Poverty and Pollution: Managing the Approaching Crisis.* Pietermaritzburg: Cluster Publications, 1999.
- Payne, A.I.L. and Crawford, R.J.M. *Oceans of Life off Southern Africa.* 2nd ed. Cape Town: Vlaeberg, 1995.
- Restoring the Land: Environment and Change in Post-Apartheid South Africa.* Editor: M. Ramphele. London: Panos, 1991.
- Ritchie, J. *The Environment Funding Guide: A Comprehensive Guide to Raising Funds for the Environment.* Cape Town: Papillon Books for Nedbank, c.1997.
- South Africa.* Editor: J. Haape. 2nd ed. Basingstroke (UK): GeoCentre International, 1995. (Insight Guides)
- Van Oudtshoorn, F. *Guide to the Grasses of South Africa.* Photographs by E. van Wyk and F. van Oudtshoorn. Pretoria: Briza, 1999.
- Van Wyk, B. and Gericke, N. *People's Plants: A Guide to Useful Plants of Southern Africa.* Pretoria: Briza, 1999.
- Wildlife of Southern Africa: A Field Guide to the Animals and Plants of the Region.* Editors: V. Carruthers and M. Pearson. Halfway House, Gauteng: Southern Book Publishers, 1997.
- White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity.* Pretoria: Department of Environmental Affairs and Tourism, 1997.
- Whyte, A.V. *Building a New South Africa, Vol 4: Environment, Reconstruction and Development: A Report from the International Mission on Environmental Policy.* Ottawa: International Development Research Centre, 1995.