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Environmental management

In terms of its biological heritage, South Africa is recognised as one of the richest nations in the world.

The Department of Environmental Affairs and Tourism's mission is to lead the sustainable development of South Africa's environment by:

- conserving the country's natural resources
- protecting and improving the quality and safety of the environment
- promoting a global sustainable-development agenda.

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

Policy and legislation

The National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), provides a regulatory framework to protect South Africa's valuable species, ecosystems and its biological wealth. It implements the *White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity*, and multilateral agreements such as the Convention on Biological Diversity (CBD).

South Africa is a signatory to the CBD, which provides the framework, norms and standards for the conservation, sustainable use and equitable benefit-sharing of South Africa's biological resources.

The Act facilitated the transformation of the National Botanical Institute (NBI) into Sanbi.

The National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003), provides for the protection and conservation of ecologically viable areas that are representative of South Africa's biological diversity, its natural landscapes and seascapes, and the management thereof. The Act envisages a national register of protected areas, with a simplified classification system of special nature reserves, national parks, nature reserves and protected environments.

It also introduces the concept of biological-diversity protection and ecosystem management. Biodiversity, conservation and ecosystem management are noted as important aims in policy and legislation that govern marine and coastal resources, freshwater and natural forests.

The Act also proposes a new system of protected areas, linking various kinds of protected environments to replace the existing fragmented system.



In addition, the Act enables the Minister of Environmental Affairs and Tourism to acquire private land by purchasing land rights for the creation of protected areas.

Based on experience with biosphere reserves, and informed by the new bioregional approach to conservation (linking the protected-area network along mountains, rivers, wetlands, the coastline and other areas of natural vegetation), the Act will result in an interlocking system of protected areas that explicitly encourages the inclusion of private land.

It recognises that people are the custodians of the land, that they need to be involved in the management of the protected land, and that they should benefit from it.

The Act caters for concurrent competence in the management of protected land. For example, an area with national-park status can now be managed by another agency, for example, a provincial parks authority. Steps have been taken to ensure that standards are upheld.

It further addresses issues of co-operative governance with provincial and local governments. It empowers the department to conclude fair negotiations with communities and private landowners for the inclusion of some of their land in South Africa's protected areas.

Regulations in terms of the National Environmental Management: Protected Areas Amendment Act, 2004 (Act 31 of 2004), provide for the proper administration of specific nature reserves, national parks and world heritage sites.

South Africa is one of only two countries in the world to have promulgated legislation specifically related to the World Heritage Convention (the other being Australia). The country's World Heritage Convention Act, 1999 (Act 49 of 1999), stipulates that all world heritage sites must have an integrated management plan in place to ensure cultural and environmental protection and sustainable development of the site.

State of the environment

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 resources. This can only be achieved through a healthy natural environment that supplies raw material; absorbs and treats waste products; and maintains water, soil and air quality.

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

To this end, the United Nations (UN) General Assembly Conference on Environment and Development adopted 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.

World Summit on Sustainable Development (WSSD)

Johannesburg hosted the WSSD in September 2002. The agreements reached in Johannesburg are a guide to action that will take forward the UN Millennium Summit Declaration's goal of halving world poverty by 2015, and incorporate decisions taken by world bodies since the Rio Earth Summit in 1992.

Among the victories of the WSSD was the launch of over 300 partnerships, including 32 energy initiatives, 21 water programmes and 32 programmes for biodiversity and ecosystem management.

The biggest success was getting the world to turn the UN Millennium Declaration into a concrete set of programmes and to mobilise funds for these programmes. The WSSD focused on the most marginalised sectors of society, including women, the youth, indigenous people and people with disabilities.

The Implementation Plan includes programmes to deliver water, energy, healthcare, agricultural development and a better environment for the world's poor. It also incorporates targets for the reduction of poverty and the protection of the environment.

Targets set at the summit will have an enormous impact, including:

- the number of people without basic sanitation and access to safe drinking water will be halved by 2015
- biodiversity loss is to be reversed by 2010, and collapsed fish stocks restored by 2015
- chemicals with a detrimental health impact will be phased out by 2020
- energy services will be extended to 35% of African households over the next 10 years.

National Strategy for Sustainable Development (NSSD)

South Africa is committed to meeting the agreements reached at the WSSD, including the development of the NSSD.

The Department of Environmental Affairs and Tourism was expected to publish its NSSD in 2006 for public comment. It is intended to be a powerful tool for addressing important issues such as water quality and quantity, climate change, waste management, soil loss and pollution, food production and strategic biodiversity management, while attending to development priorities associated with tackling poverty and basic human needs.

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.

Although the country covers only 2% of the world's land area, nearly 10% of the world's plants and 7% of its reptiles, birds and mammals are found here.

The three internationally recognised biodiversity hotspots in South Africa are the Cape Floral Region in the south, the Succulent Karoo that the country shares with Namibia, and that of Maputoland-Pondoland in the east, which extends into Swaziland and Mozambique.

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

 World Wetlands Day: 2 February
National Water Week: 19 to 25 March
Earth Day: 20 March
World Water Day: 22 March
World Meteorological Day: 23 March
World Environment Day: 5 June
World Oceans Day: 8 June
World Desertification Day: 17 June
National Arbour Week: 1 to 7 September
International Day for the Protection of the Ozone Layer: 16 September
World Tourism Day: 27 September
World Habitat Day: 4 October
National Marine Day: 20 October

known worldwide – are found in South African waters, with about 12% of these occurring nowhere else.

The country's natural heritage is best described according to a systematic classification of regions, or biomes. A biome is a broad ecological unit representing a major life zone, which extends over a large area, and contains relatively uniform plant and animal life closely connected with environmental conditions, especially climate.

The White Paper states that South Africa is one of six countries in the world with 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 eight major terrestrial biomes, or habitat types, in South Africa, which can, in turn, be divided into 70 veld types.

The degree to which each of these biomes is threatened varies, depending on the fertility of the soil, the economic value derived 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 Limpopo, 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 galpinii*), mopani (*Colophospermum mopane*) and wild fig (*Ficus spp.*) In the valley bushveld of the south, euphorbias and spekboom trees (*Portulacaria afra*) dominate.

Abundant wild fruit trees provide food for many birds and animals in the savanna biome.

Grey loeries, hornbills, shrikes, flycatchers and rollers are birds typical of the northern regions. The subtropical and coastal areas are home to Knysna loeries, purple-crested loeries 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.

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

Celebrating the Age of Hope by Protecting Our Environment was the theme to commemorate National Environment Week from 5 to 11 June 2006.

National Environment Week has become an annual feature on the South African calendar, with a range of important activities scheduled countrywide. On World Environment Day on 5 June 2006, the Minister of Environmental Affairs and Tourism, Mr Marthinus van Schalkwyk, launched South Africa's National Environmental Awareness Campaign – Indalo Yethu. This campaign is a legacy project of the World Summit on Sustainable Development, which was hosted in Johannesburg during 2002. Indalo Yethu intends to reinforce the role of environmental protection within the context of the country's economic and social-development programmes.

By June 2006, the Department of Environmental Affairs and Tourism had created over 16 800 job opportunities, 254 permanent jobs and almost 103 000 training days in the preceding year with its social-responsibility projects and programmes.

It planned to launch a social impact study in 2006 to evaluate these programmes, and aimed to create 12 500 more job opportunities, 300 more permanent jobs and over 130 000 training days.

The Thubaleth' Elihle (our good community) community craft group, involving 80 rural women, is one of the initiatives launched to help local communities who are under increasing social and economic pressure to make sustainable use of the environmental resources available to them. The women of Thubaleth' Elihle produce goods made from fabric woven from an indigenous water-loving sedge called 'ikhwane', which is the most abundant plant in the 400-hectare Mbongolwane wetland.

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 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 Au-grabies national parks are the largest.

Overgrazing and easily eroded soil surfaces are causing 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 in summer, and frost in winter. A number of perennial rivers such as the Orange, Vaal, Pongola, Kei and Umzimvubu originate in, and flow through, the area. Trees are scarce and are found mainly on hills and along riverbeds. Karee (*Rhus lancea*), wild currant (*Rhus pyroides*), white stinkwood (*Celtis africana*) and several acacia species are the most common.

The grassland biome has the third-largest number of indigenous plant species in the country.

Eight mammal species endemic to South Africa occur in a wild state in this biome. Two of these, namely the black wildebeest and the blesbok, occur mainly in the grassland biome.

The area is internationally recognised as an area of high species endemicity as far 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 multicoloured carpet (from August to October, depending on the rainfall).

This is a winter-rainfall area with extremely dry and hot summers. Succulents with thick, fleshy leaves are plentiful. Most trees have white trunks to reflect the heat.

The quiver tree (*Aloe dichotoma*) and the human-like elephant's trunk (*Pachypodium namaquanum*) are prominent in the Richtersveld. Grass is scarce.

The 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 is found mainly in the Western Cape. This is 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 those in the Erica family). It is made up mainly of the protea, heathers and restio, and incorporates a diversity of plant species (more than 8 500 kinds, over 6 000 of which are endemic).

The fynbos biome is famous for 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 Table Mountain and Agulhas national parks.

This biome is not very rich in bird and mammal life, but does include the endemic Cape grysbok, the geometric tortoise, Cape sugarbird and the protea seed-eater. The mountains are the habitat of the leopard, baboon, honey-badger, caracal, rhebuck and several types of eagle and dassies.

Forest biome

South Africa's only significant forests are those of Knysna and Tsitsikamma in the Western and Eastern Cape, respectively.

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

Thicket biome

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

It is often impenetrable and has little herbaceous cover. Roughly 20% of the species in the thicket biome are endemic to it.

Desert biome

True desert is found under very harsh environmental conditions, which are even more extreme than those found in the succulent Karoo and the Nama-Karoo biomes. The climate is characterised by summer rainfall, but also by high levels of summer aridity. Rainfall is highly variable from year to year. Desert is found mostly in Namibia, although it does occur in South Africa in the lower Orange River Valley.

The vegetation of the desert biome is characterised by the dominance of annual plants (often annual grasses). This means that after a rare season of abundant rain, the desert plains can be covered with a sea of short annual grass, whereas in drier years, the plains appear bare with the annual plants persisting in the form of seeds.

Perennial plants are usually encountered in specialised habitats associated with local concentrations of water. Common examples of such habitats are broad drainage lines or washes. Nearer the coast, the role of coastal fog also governs the distribution of certain species commonly associated with the desert.

The desert biome incorporates an abundant insect fauna, which includes many tenebrionid beetles, some of which can use fog water. There are also various vertebrates including reptiles, springbok, ostrich, gemsbok, snakes and geckos.

Some areas in the desert biome are formally protected in the Richtersveld National Park.

Preserving biodiversity

Biodiversity plays a crucial role in sustainable development and poverty eradication. Fundamental

changes to the legislative, policy and institutional framework for natural resource management have resulted in a shift in focus from an elitist conservation approach to a management approach based on South Africa's recognition of the contribution of biological resources to food security, science, economy, cultural integrity and well-being.

The country's conservation areas contribute to job creation and socio-economic upliftment, and continue to serve as a foundation of the tourism industry.

South Africa is a very popular tourist destination. The main attractions are nature-based tourism facilities such as national parks and private game reserves. There are some 9 000 privately owned game ranches in South Africa, covering about 13% of the country's total land area. The contribution of these areas in maintaining South Africa's unique biodiversity is incalculable.

The publication in 2006 of the National Spatial Biodiversity Assessment by the Department of Environmental Affairs and Tourism and Sanbi revealed that 34% of South Africa's ecosystems are threatened, with 5% critically endangered; while 82% of the 120 main rivers are threatened and 44% critically endangered. Of the 13 groups of estuarine biodiversity, three are in critical danger and 12% of marine biozones are under serious threat.

Because of the geographic spread and diversity of South Africa's plant and animal species – up to 80% of significant biodiversity lies outside existing protected areas – a traditional approach to conservation is inadequate. Biodiversity priorities have to be integrated with all citizens' policies, plans and programmes.

The Minister of Environmental Affairs and Tourism, Mr Marthinus van Schalkwyk, launched South Africa's National Biodiversity Strategy and Action Plan (NBSAP) in June 2006. It aims to guide conservation and the management of biodiversity to ensure sustainable and equitable benefits for all communities.

The NBSAP highlights five strategic objectives, such as the need for a network of protected areas that conserve a sample of all South Africa's biodiversity, specifies how these are to be realised, and sets five- and 15-year targets for each.

The NBSAP also provides for the entrenchment of biodiversity concerns in production sectors such as mining and forestry, by focusing on the inclusion

of biodiversity priorities in guidelines and codes of best practice, and on measures to encourage sustainable production practices.

The NBSAP informs the creation, in law, of the National Biodiversity Framework to ensure an integrated, co-ordinated and consistent approach to biodiversity management by organs of state in all spheres of government, non-governmental organisations (NGOs), the private sector, local communities, other stakeholders and the public.

Conservation areas

South Africa is committed to meeting the World Conservation Union (IUCN) target of 10% of land area under protection.

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

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 underdeveloped, and access is strictly controlled with no vehicles 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 the Baviaanskloof Wilderness Area in the Eastern Cape.

Marine protected areas (MPAs)

The department promulgated four new MPAs in 2004, bringing the total of MPAs to 23, which cover almost 19% of the coastline.

The promulgation of the MPAs follows South Africa's commitment (at the World Parks Congress in 2003) to expand the country's MPAs. The congress recommended that by 2012 a global system of effectively managed MPAs be implemented. The accepted target is to protect 20% of each habitat.

MPAs conserve natural environments and assist in the management of fisheries by protecting and rebuilding economically important stocks. Many of the new MPAs will be used to further develop and regulate coastal ecotourism opportunities.

National parks and equivalent reserves

SANParks manages several national parks throughout South Africa's provinces, excluding Gauteng and KwaZulu-Natal. The system of national parks is representative of the country's important ecosystems and unique natural features.

Commercial and tourism-conservation development and the involvement of local communities are regarded as performance indicators. These areas include national parks proclaimed in terms of the National Parks Act, 1976 (Act 57 of 1976), provincial parks, nature reserves and indigenous state forests.

Some of these natural and scenic areas are extensive and include large representative areas of at least one of the country's biomes. Since 1994, five new national parks have been established and 379 000 ha have been added to the parks system.

The national parks are:

- Addo Elephant National Park
- Agulhas National Park
- Au-grabies Falls National Park
- Bontebok National Park
- Camdeboo National Park
- Golden Gate Highlands National Park
- Kalahari Gemsbok National Park (part of the Kgalagadi Transfrontier Park)
- Karoo National Park
- Knysna National Lake Area
- Kruger National Park
- Marakele National Park



The Department of Environmental Affairs and Tourism hosted the first-ever Environmental Enforcement Conference in Durban in February 2006.

Role-players from the various spheres of government and the international arena met under the theme of *Stepping Up Environmental Enforcement: New Powers, Tools and Networks*.

The conference aimed to provide a platform for participants to showcase success stories, obstacles and innovations in environmental enforcement. The Enforcement Work Programme with the Environmental Agency of England and Wales was launched during the conference.

- Mapungubwe National Park
- Mountain Zebra National Park
- Namaqua National Park
- Richtersveld National Park
- Table Mountain National Park (TMNP) (which incorporates the Cape of Good Hope, Table Mountain and Silvermine nature reserves)
- Tankwa Karoo National Park
- Tsitsikamma National Park
- Vaalbos National Park
- Wilderness National Park
- West Coast National Park.

In June 2006, Minister van Schalkwyk announced that in terms of priorities identified in the NBSAP, another 230 000 ha would be added to the national parks to ensure the inclusion of underrepresented biomes, such as grasslands. Among others, the Knysna forests and Soetkraal would become part of Tsitsikamma National Park and the QwaQwa Nature Reserve would be added to the Golden Gate Highlands National Park.

The Department of Environmental Affairs and Tourism has invested about R120 million in social responsibility-funding for infrastructure development in Mapungubwe National Park, and a further R30 million has been spent on land acquisition.

During 2006/07, portions of the new Wild Coast National Park, located in a globally recognised biodiversity hotspot with more than 1 500 plant species alone, were declared. It is expected to draw more than 245 000 tourists by 2008 and 270 000 by 2013, creating some 3 260 direct and indirect new jobs.

The new Blyde River National Park was declared on Heritage Day, 24 September 2006. It lies in an area with over 2 000 plant species (of which 163 are Red Data plants), which is more than in the entire Kruger National Park. The park is in the Blyde River Canyon, which has one of the richest troves of plants and animals in southern Africa. Some R18 million has been allocated for infrastructure for the park over the next three years, starting with a R10-million luxury hiking trail. The park is expected to boost the local economy by R500 million over the next decade.

Transfrontier conservation areas (TFCAs)

A TFCA is a cross-border region. The conservation status of the areas within it ranges from national parks, private game reserves and communal

natural-resource management areas to hunting-concession areas. Although fences, highways, railway lines or other barriers separate the constituent areas, they are managed jointly for long-term sustainable use of natural resources. Unlike in transfrontier parks, free movement of animals between the components of a TFCA is not always possible.

TFCAs aim to facilitate and promote regional peace, co-operation and socio-economic development. The success of TFCAs depends on community involvement. In turn, TFCAs are likely to provide local communities with opportunities to generate revenue.

TFCAs are expected to allow tourists easy movement across international boundaries into adjoining conservation areas.

The six identified TFCAs are the:

- Ais-Ais/Richtersveld Transfrontier Conservation Park
- Kgalagadi Transfrontier Park
- Limpopo-Sashe TFCA
- Great Limpopo Transfrontier Park
- Lubombo Transfrontier Conservation and Resource Area
- Maloti-Drakensberg Transfrontier Conservation and Development Area.

On 5 April 2006, over 120 biodiversity scientists from across the globe, including academics, experts and students met in Cape Town for a two-day science symposium. The Department of Science and Technology, in conjunction with the Copenhagen-based Global Biodiversity Information Facility (GBIF), organised the event.

South Africa is the first African country to host this symposium since its inception four years ago. This pays tribute to the country's vast biodiversity wealth and its technological research contributions towards the globally sustainable use of natural resources.

The annual science symposium forms part of the GBIF's ongoing global efforts to find ways of slowing down and eventually curbing the loss of biodiversity through long-term conservation and the sustainable use of biological biodiversity.

In June 2006, a memorandum of understanding (MoU) between South Africa, Botswana and Zimbabwe was signed for the establishment of the Limpopo/Shashe TFCA.

The proposed Limpopo/Shashe TFCA is 1 950 km² in extent, 270 km² in South Africa, 720 km² in Botswana and 960 km² in Zimbabwe.

Biosphere reserves

The National Environmental Management: Protected Areas Amendment Act, 2004 protects South Africa's biosphere reserves, which are generally formed around existing core conservation areas.

Biosphere reserves include outstanding natural beauty and biological diversity, exist in partnership with a range of interested landowners, and can incorporate development, as long as it is sustainable, while still protecting terrestrial or coastal ecosystems.

South Africa's four biospheres are the:

- Kogelberg Biosphere Reserve, which was registered with the United Nations Educational, Scientific and Cultural Organisation (Unesco) in 1998.
- Cape West Coast Biosphere Reserve, which was listed in 2000. It covers 376 900 ha that include a number of threatened vegetation types and important bird-breeding sites.
- Waterberg Biosphere Reserve in Limpopo, which was listed in 2001. It covers 1,4 million ha that include the Marakele National Park and the Nylsvlei Ramsar Site.
- Kruger-to-Canyons Biosphere Reserve, which was also listed in 2001, and covers more than 3,3 million ha that span the boundary between Limpopo and Mpumalanga. The core areas comprise 13 declared protected areas, with a major portion of the Kruger National Park as the largest core area.

National and cultural monuments

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

World heritage sites

By June 2005, there were 788 world heritage sites in 134 countries. Africa had 63 sites. A total of 154 were natural sites, 611 were cultural sites and 23 were mixed sites.

In May 1997, South Africa ratified the World Heritage Convention. The South Africa World Heritage Convention Committee is responsible for the identification of possible sites in South Africa and the co-ordination of the convention.

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. 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.

South Africa has seven world heritage sites proclaimed by Unesco, namely Robben Island; the GSWLP; the hominid sites at Swartkrans, Sterkfontein and Kromdraai (known as the Cradle of Humankind); the Ukhahlamba-Drakensberg Park (a mixed natural and cultural site); the Mapungubwe Heritage Site; the Cape Floral Kingdom; and the Vredefort Dome.

The Vredefort Dome is an ancient extraterrestrial impact site spanning the Free State and North West provinces. Formed two billion years ago, it is the world's most ancient meteorite impact site and the third-largest, measuring 140 km wide. It was declared a world heritage site at the 29th World Heritage Committee meeting held in Durban in July 2005.

Achieving world heritage site status has added to Vredefort's economic and tourism potential. Consequently, the Department of Environmental Affairs and Tourism has allocated R18 million from its poverty-relief programme for tourism and infrastructural development at the Vredefort Dome site.

The world heritage status of Sterkfontein's fossil hominid sites was extended in July 2005 to include the Taung skull fossil site in North West and the Mokopane Valley in Limpopo.

The Cradle of Humankind has one of the world's richest concentrations of hominid fossils, evidence of human evolution over the last 3,5 million years.

Found in Gauteng and North West, the fossil sites cover an area of 47 000 ha. The remains of ancient forms of animals, plants and hominids are captured in a bed of dolomite deposited around 2,5 billion years ago.

Although other sites in south and east Africa have similar remains, the cradle has produced more than 950 hominid fossil specimens.

The R347-million Cradle of Humankind development, initiated by the Gauteng Government, is the first public-private partnership of its kind in South Africa. The aim is to develop and manage the World Heritage Site as a premier tourist destination. Other partners include the University of the Witwatersrand, which owns the Sterkfontein caves and is the major excavator of the cradle site.

On 7 December 2005, President Thabo Mbeki launched a state-of-the-art visitors' facility named Maropeng, Setswana for 'the place where we once lived', at the cradle. The centre is designed to help tourists, schoolchildren and others explore the history of humankind.

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 sustainable use of protected areas such as the Kosi Bay Lake System in KwaZulu-Natal. Nature areas in private ownership are proclaimed and are managed to curtail undesirable development in areas with high aesthetic or conservation potential.

Conservancies are formed to involve the ordinary landowner in conservation. 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 to

midland marshes, swamp forests and estuaries, linked by green corridors of streambank wetlands.

South Africa became a contracting party to the Ramsar Convention in 1975. The country's Ramsar sites include Nylsvlei Nature Reserve, Blesbokspruit, Barberspan, Seekoeivlei, 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 the 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 ensures that South Africa's obligations in terms of the Ramsar Convention are met.

The programme aims to protect wetlands in South Africa against degradation and destruction, while striving for the ideal of wise and sustainable use of resources, to ensure that the ecological and socio-economic functions of wetlands are sustained for the future.

South Africa is a member of Wetlands International, an international body dedicated to conserving the world's wetlands.

The Working for Wetlands Programme focuses on wetland restoration, while maximising employment creation; support for small, medium and micro enterprises (SMMEs); and transfer of skills to the beneficiaries of the programme's projects.

The programme contributes directly to the objectives of the Expanded Public Works Programme (EPWP) and is a partnership between the departments of environmental affairs and tourism, of water affairs and forestry, and of agriculture.

World Wetlands Day marks the date of the signing of the Convention of Wetlands on 2 February 1971 in the Iranian city of Ramsar.

Botanical gardens

Sanbi was established on 1 September 2004 with the renaming of the NBI in terms of the National Environmental Management: Biodiversity Act, 2004. Sanbi, with its head office at Kirstenbosch National Botanical Garden in Cape Town, is an autonomous state-aided institute whose vision is to be the leading institution in biodiversity science in Africa, facilitating conservation and the sustainable development of living resources and human well-being. In addition to new biodiversity-related

initiatives linked to the Act, traditional activities undertaken by Sanbi include:

- collecting, displaying and cultivating plants indigenous to South Africa
- undertaking and promoting research into indigenous plants and related matters
- studying, researching and cultivating threatened plant species
- promoting the utilisation of the economic potential of indigenous plants
- running environmental-education programmes.

Sanbi manages eight national botanical gardens in five of South Africa's nine provinces. The gardens collectively attract over a million visitors a year, are signatories to the International Agenda for Botanic Gardens in Conservation, and are founding members of the African Botanic Gardens Network. The largest garden is Kirstenbosch, situated on the eastern slopes of Table Mountain in Cape Town. It displays 5 300 indigenous plant species, and was voted one of the top seven botanical gardens in the world at the International Botanical Congress held in Missouri Botanical Garden, United States of America (USA), in 1999. Kirstenbosch National Botanical Garden, as part of the TMNP, was included in the Cape Floral Region World Heritage Site in 2004, the first botanical garden in the world to be included within a natural world heritage site.

Kirstenbosch gets more than 750 000 visitors annually. The Kirstenbosch National Botanical Garden houses the Kirstenbosch Research Centre, the Centre for Biodiversity Conservation, Gold Fields Environmental Education Centre, the Botanical Society Conservatory, two restaurants, a conference venue, gift shops, a coffee bar, concert venues, sculpture exhibits and the Centre for Home Gardening, which includes an indigenous plant retail nursery.

 The Kirstenbosch-South Africa exhibit at the 2006 Chelsea Flower Show in the United Kingdom won a gold medal – the 28th out of 31 annual entries by South Africa to the show.

Co-ordinated by the South African National Biodiversity Institute, the exhibit featured 2 500 kg semi-precious stones and flowers, and had a waterwise theme. It was sponsored by First National Bank.

The other gardens in the national network are the Karoo Desert in Worcester, Harold Porter in Betty's Bay, Free State in Bloemfontein, KwaZulu-Natal in Pietermaritzburg, Lowveld in Nelspruit, Walter Sisulu (formerly Witwatersrand) in Roodepoort/Mogale City, and the Pretoria National Botanical Garden.

The Pretoria National Botanical Garden houses the National Herbarium of South Africa, the largest in the southern hemisphere. The evolution, diversity, distribution and relationships of southern Africa's 24 000 species of plants, based on the Sanbi collection of over 1,8 million specimens in its three herbaria, are researched. There are also regional herbaria in Durban (KwaZulu-Natal Herbarium) and at the Kirstenbosch Research Centre (Compton Herbarium).

The Harold Porter National Botanical Garden boasts *Disa uniflora* in its natural habitat (flowering from mid-December to the end of January), as well as South Africa's national flower, the king protea (*Protea cynaroides*).

The Walter Sisulu National Botanical Garden accommodates more than 600 naturally occurring plant species, over 230 bird species, and a number of reptiles and small mammals. These include jackal and antelope, which occur in the natural areas of the garden. This garden receives some 180 000 visitors annually and is the fastest-growing of the Sanbi-managed gardens. It covers over 275 ha and consists of landscaped and natural areas. All the garden's plants are indigenous to southern Africa.

During 2005, Sanbi completed new environmental-education, restaurant and visitor facilities at the Lowveld, Pretoria, Walter Sisulu and Free State national botanical gardens. Many of these capital projects were co-financed by the EPWP within the department. Sanbi now operates environmental-education programmes within its national botanical gardens, and outreach greening programmes focused on promoting indigenous gardening in disadvantaged schools in surrounding areas.

The Greening of the Nation Project, managed by Sanbi, is a new government-funded programme that has been initiated in various provinces of South Africa for community and school greening projects. Its activities include the greening of towns (road islands and entrances), schools, crèches, day-care centres, community parks, cemeteries, police stations, and cultural villages, and the development of community nurseries.

Many projects include the development of indigenous gardens and vegetable gardens. The programme works closely with Food and Trees for Africa, the first national non-governmental, non-profit, greening organisation in South Africa, established in 1990.

Sanbi is the management agency for the US\$20-million Cape Action Plan for People and the Environment Project, which aims to conserve biological diversity within the Cape Floral Kingdom. From 1996 to 2005, Sanbi served as the implementing agency for the US\$5-million Southern African Botanical Diversity Network Project that aimed to upgrade facilities and strengthen the level of botanical expertise throughout the subcontinent. The project, which was funded by the Global Environmental Facility (GEF), United Nations Development Programme, United States Agency for International Development, and the IUCN regional office for southern Africa was completed in 2005.

Sanbi also manages the Working for Wetlands Programme, with its offices based at the Pretoria National Botanical Garden.

In addition to herbarium and taxonomic research, the Kirstenbosch Research Centre in Cape Town is a centre of excellence for biodiversity research. The research programme focuses on the impact of climate change, invasive alien species and land-use on biodiversity, as well as the development of conservation plans for threatened ecosystems and species. The centre has developed a new vegetation map for South Africa and maintains the Protea Atlas Database, one of the most comprehensive plant databases in the world.

The Leslie Hill Molecular Systematics Laboratory is one of the facilities at the Kirstenbosch Research Centre. A DNA-bank has been established at the laboratory, in collaboration with the Royal Botanic Gardens, Kew, in the United Kingdom (UK). The objectives of the bank, which is funded by the UK-based Darwin Initiative, are to archive the DNA of at least one species of all 2 200 genera of South Africa's flowering plants, to train South African researchers and students in high-profile biotechnologies, and to produce a tree of life of South African plants.

The Millennium Seed Bank Project in South Africa is part of a 10-year (2000 to 2010) international programme that aims to collect and conserve 10% of the world's seed-bearing plant species (some 24 000 species) in the Millennium

Seed Bank facility of the Royal Botanic Gardens in Kew by 2010. Sanbi joined the Millennium Seed Bank International Programme in 2000. The South African collaboration aims to contribute by collecting the seed of about 2 500 plant species indigenous to the region for storage in this long-term *ex situ* conservation facility.

Some municipalities have botanical gardens that are not controlled by Sanbi. These include the Wilds and Melville Koppies in Johannesburg, the Johannesburg Botanic Garden, the Grahamstown Botanical Garden (managed by Rhodes University) and the municipal Durban Botanic Gardens.

Other botanical gardens in South Africa not controlled by Sanbi include the Manie van der Schijff Botanical Garden (University of Pretoria), University of Stellenbosch Botanical Garden, North West University Botanical Garden (Potchefstroom Campus), University of KwaZulu-Natal Botanical Garden (Pietermaritzburg Campus), the Lost City Gardens (near Sun City, North West) and the Garden Route Botanical Garden in the southern Cape.

Zoological gardens

Founded in 1899, the National Zoological Gardens (NZG) of South Africa in Pretoria is the only zoo in South Africa with national status and membership of 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.

The NZG, considered one of the 10 best in the world, extends over an area of about 80 ha. In 2005, the zoo attracted more than 600 000 visitors.

On 1 April 2006, the zoo's collection included 2 889 specimens of 213 mammal species, 1 418 specimens of 221 bird species, 4 639 specimens of 217 fish species, 118 specimens of 12 invertebrate species, 529 specimens of 113 reptile species, and 90 specimens of seven amphibian species.

These figures comprise the animals housed at the NZG in Pretoria, the two game-breeding centres in Lichtenburg and Mokopane, and the satellite zoo and animal park at the Emerald Animal World in Vanderbijlpark.

In April 2004, the NZG was declared a national research facility, subject to the provisions of the National Research Foundation (NRF).

The NRF is a government agency responsible for supporting and promoting research, and providing research facilities to facilitate the creation of knowledge, innovation and development in all fields of science and technology. (See Chapter 18: *Science and technology*.)

In 2001, the NZG established the 203-ha Emerald Animal World housed at the Emerald Safari Resort and Casino in Vanderbijlpark. The facility comprises a 189-ha game park and a 14-ha zoo.

The Emerald Animal World facility houses more than 760 animals representing 127 species of mammals, birds and reptiles. Animals that can be viewed there include white rhinoceros, hippopotamus, lion, cheetah, various antelope and reptile species, and even bats. All the animals were provided by the national zoo's satellite facilities in Lichtenburg and Mokopane.

The Johannesburg Zoological Gardens, or Johannesburg Zoo, which houses more than 10 000 animals, celebrated its centenary in 2004.

The core business of Johannesburg Zoo, which is registered as a non-profit company, is the accommodation, enrichment, husbandry and medical care of wild animals.

It is also renowned for its successful breeding programmes involving several endangered South African bird species such as the wattled crane and ground hornbill.

The zoo covers 54 ha and houses 2 070 animals of 365 species.

Breeding centres

There are a number of game-breeding centres in South Africa. The NZG of South Africa is responsible for the management of the Lichtenburg Game-Breeding Centre, which covers an area of some

4 500 ha, and the Game-Breeding Centre in Mokopane, covering an area of 1 334 ha. The two centres supplement the zoo's breeding programme for various endangered animals, and the zoo's own animal collection.

The Lichtenburg Game-Breeding Centre houses, among other animals, Père David's deer, pygmy hippopotamus, white rhinoceros, 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 at 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 Mokopane Game-Breeding Centre is home to an abundance of exotic and indigenous fauna such as lemur, the rare tsessebe, roan antelope and black rhino.

De Wildt Cheetah-Breeding and Research Centre, situated near Pretoria, is best known for its highly successful captive-breeding programme that contributed to the cheetah being removed from the endangered list of the *South African Red Data Book – Terrestrial Mammals* in 1986.

De Wildt also breeds a number of rare and endangered African species. The most spectacular of these is the magnificent king cheetah, which is a true cheetah, but with a variation of coat patterns and colouring. De Wildt also plays a major role in the breeding and release of wild dogs. It has donated breeding nucleuses of the highly endangered riverine rabbit and suni antelope to the Kruger National Park.

The De Wildt Vulture Unit is a rehabilitation and holding facility for injured, poisoned and disabled vultures.

The Hoedspruit Endangered Species Centre in Mpumalanga was initially established as a breeding programme for the then endangered cheetah. Following the success of the cheetah-breeding programme, it has evolved into a breeding programme for other endangered African animal species. The centre caters for, among other things, five species of vulture: Cape griffins, and whitebacked, hooded, whiteheaded and lappetfaced vultures.

The Hoedspruit Centre is also known for its wild dog-breeding programme.

The Hoedspruit Research and Breeding Programme also includes the rare black-footed cat,

February 2006 marked the first anniversary of South Africa's implementation of the Kyoto Protocol.

South Africa is one of the signatories to the protocol, an amendment to the United Nations Framework Convention on Climate Change according to which countries commit to reducing their emissions of carbon dioxide and five other greenhouse gases, or engaging in emission trading if they maintain or increase emissions.

the vulnerable African wild cat, ground hornbills (in co-operation with the NZG in Pretoria), bald ibis and the endangered blue crane. Elephant, white rhino, buffalo, caracal, sable antelope, bushbuck and tsessebe have also been cared for and rehabilitated there.

Aquaria

There are well-known aquaria in Pretoria, Port Elizabeth, Cape Town and Durban.

The Aquarium and Reptile Park of the Pretoria Zoo is the largest 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 one of the city's major attractions. Exhibits include an underwater observation area, a dolphin-research centre, various smaller tanks of 40 different species of bony fish, as well as two larger tanks that display sharks and stingrays.

East London has a smaller aquarium, which is also well worth visiting.

At the Two Oceans Aquarium situated at the Victoria and Alfred Waterfront, Cape Town, more than 3 000 specimens represent some 300 species of fish, invertebrates, mammals, birds and plants supported by the waters in and around the Cape coast.

UShaka Marine World in Durban incorporates both fresh and sea water, and is the fifth-largest aquarium in the world by water volume. It comprises Sea World, Dolphin World, Beach World, and Wet and Wild World.

Sea World incorporates a unique shipwreck-themed aquarium, a penguin rookery and a 1 200-seater dolphin stadium (the largest dolphinarium in Africa). It also offers edutainment tours and special interactive activities such as snorkelling and scuba diving. In addition, it features a rocky touch-pool, where visitors can touch a starfish or sea cucumber with the help of specially trained guides.

Snake parks

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

The Fitzsimons Snake Park in Durban houses about 250 snakes, including the world's longest (reticulated python), most venomous (boomslang, puff adder and black mamba) and rarest (long-nose tree snake and Madagascar tree boa) snakes. Up to 500 snakes hatch at the park each year. The Adventure Walk enables visitors to view a large variety of snakes that are kept in secure glass-viewing enclosures. The park also offers educational, interactive snake demonstrations, and junior and advanced herpetology (study of reptiles) classes.

The Port Elizabeth Snake Park at Bayworld has a wide variety of South African and foreign reptiles, including tortoises, boa constrictors, pythons, crocodiles, lizards and deadly venomous snakes such as cobras, mambas and rattlers. Rare and threatened species, including the Madagascar ground boa, are housed safely in realistically landscaped glass enclosures.

The Aquarium and Reptile Park situated at the NZG in Pretoria houses 80 reptile species from all over the world.

The Hartbeespoort Dam Snake and Animal Park near Pretoria features one of the finest reptile collections in southern Africa. It offers seal shows and snake-handling demonstrations.

Marine resources

The South African coastline covers more than 3 200 km, linking the east and west coasts of Africa. South Africa's shores are particularly rich in biodiversity with some 10 000 species of marine plants and animals having been recorded.

The productive waters of the west coast support a variety of commercially exploited marine life, including hake, anchovy, sardine, horse mackerel, tuna, snoek, rock lobster and abalone. On the east coast, squid, linefish and a wide range of intertidal resources provide an important source of food and livelihood for coastal communities. Marine life that is not harvested, such as whales, dolphins and seabirds, is increasingly recognised as a valuable resource for nature-based tourism.

The South African fishing industry, which was once concentrated in the hands of a few, largely white-owned companies, has undergone intensive transformation over the past 10 years.

New fisheries

The department is committed to job creation and

economic growth, and to exploring new economic opportunities within the fishing sector.

The termination of South Africa's 25-year-old fisheries agreements with Japan and Taiwan has paved the way for the development of a South African fishery for large pelagic fish, such as tuna and swordfish. The first long-term 10-year commercial fishing rights have been issued in this sector as well as the abalone sector.

In addition, the department is developing nine new fisheries over the next five years, including Eastern Cape abalone, limpets, ornamental fish, East Coast rock lobster, sand soldier and Indian Ocean squid in KwaZulu-Natal. Two experimental fisheries have been opened for the KwaZulu-Natal deepwater rock lobster and octopus fisheries to determine the feasibility of developing both sectors into full-scale commercial fisheries.

Through regular scientific research, the department establishes what the optimal use of each fish species should be. This is done annually and ensures that fish stocks are managed sustainably.

Long-term rights allocations

In March 2005, the Minister of Environmental Affairs and Tourism announced 19 draft fishing policies for the allocation of long-term fishing rights in South Africa. A draft line-fish policy was also published following a series of fishing izimbizo held along the coastline of South Africa, which allowed for input from the public and stakeholders. The policies will guide the process by which the department will allocate fishing rights for periods of between eight and 15 years. This will create more stability and sustainable jobs, while providing an enabling environment for entrepreneurs.

For the first time ever, policy considerations have been codified in significant detail. South Africa is one of only a handful of countries that has codified its fisheries policies, and is perhaps the only country to have done so in such detail.

The allocation of fishing rights is managed in terms of the clustered approach to fisheries management. The 19 different fishing sectors remain grouped into four clusters. This was done in response to the call to simplify and streamline the allocation process.

The clusters allow for the design of processes that suit the different fishers involved. Cluster A comprises the most organised and capital-

intensive fisheries. Cluster B comprises those fisheries that, although fairly well organised, are significantly less capital-intensive. Cluster C comprises large numbers of fishers who are poorly organised, but who have access to valuable fish stocks. Cluster D comprises those fishers who are not only poorly organised, but are also involved in very marginal fisheries.

The four clusters are as follows:

Cluster A

- hake deep-sea trawl
- hake inshore trawl
- horse mackerel
- small pelagics
- patagonian tooth fish
- south coast rock lobster
- KwaZulu-Natal prawn trawl.

Cluster B

- West Coast rock lobster (WCRL) (off shore)
- hake long line
- squid
- tuna pole
- seaweed
- demersal shark.

Cluster C

- hand-line hake
- WCRL (near shore).

Cluster D

- oysters
- white mussels
- net fishing (small nets/gillnets and beach seine/trek-nets)
- KwaZulu-Natal beach seine.

This process followed the allocations of medium-term rights in 2001, when the department moved away from allocating annual permits to the allocation of four-year rights.

By June 2006, 8 028 long-term fishing-rights allocations had been received, about twice the number expected. Rights were awarded to 1 516 successful applicants to catch about 600 000 tons of fish. In allocating these rights, the Department of Environmental Affairs and Tourism achieved real empowerment, in that 29% of the deep-sea hake trawl (14% in 2001), 66% of the pilchard catch (64% in 2001), and 61% of the offshore WCRL catch (51% in 2001) is now black-controlled.

In June 2006, Minister van Schalkwyk announced the allocation of 392 additional long-term fishing rights in the WCRL near-shore fishery sector, nearly doubling the total number of

allocations from 418 to 812. These rights will be valid for a period of 10 years.

The area where WCRL rights are allocated stretches from Port Nolloth to Gansbaai.

Aquaculture

Aquaculture production in South Africa is in the region of 4 000 t a year, of which much is attributable to abalone and mussel production.

Since 2002, abalone farms on the south coast have collectively produced more abalone products for export than wild abalone fishery has.

These farms are creating a substantial demand for fresh kelp fronds, which are fed to cultured abalone. The department is undertaking research into seaweed cultivation to establish whether the nutrient-rich wastewater from abalone farms can be effectively used to cultivate seaweeds for abalone feed. If this proves to be feasible, it would have the added benefit of purifying the wastewater that is pumped out of abalone farms into the sea.

The success of the abalone farming industry has prompted new interest in the culture of fin fish in South Africa. One of the most exciting local species for the aquaculture industry is the dusky kob. Research carried out in land-based tanks and cages at Rhodes University showed that this species is easily kept in captivity, growing from fingerlings to over one kilogram in less than a year. Subsequently, a number of fishing companies and other interested parties have taken up the challenge of farming dusky kob and are following their own paths to the commercialisation of the species.

The coast

The *White Paper for Sustainable Coastal Development in South Africa* recognises that the co-ordination between the lead department in each province, and other departments and role-players whose work forms part of the overall coastal-management effort, is essential. In accordance with the *White Paper*, a coastal committee was established in each of the four coastal provinces. Progress has been made towards the establishment of a national coastal committee.

It was envisaged that the Coastal Management Bill, which was drafted in 2002, would be tabled in Parliament in 2006. The Bill provides for important interventions that will regulate, enhance, preserve or rehabilitate sensitive or overexploited coastal areas. It also ensures equitable access to South Africa's

coastline, and aligns South African legislation with international laws and conventions.

During 2004/05, a number of initiatives were strengthened and implemented under the Coastcare banner. These included the formulation of interpretive signage for the coast, the Adopt-a-Beach Programme and the Coastcare Induction Programme.

Mariculture

Research geared at mariculture development resulted in the development of scallop shellfish, kob and white stumpnose finfish mariculture projects and a three-year exploratory tuna-farming project. Another successful mariculture project is the culturing of sea urchins by closing the life cycle and rearing larvae to market size within 12 months.

4x4 regulations

Following the successful implementation of the 4x4 regulations that provide for the controlled use

In February 2006, the Minister of Environmental Affairs and Tourism, Mr Marthinus van Schalkwyk, announced interventions aimed at alleviating the suffering of poverty-stricken coastal communities.

Government had spent more than R270 million over the past two years on repairing and upgrading fishing harbours, and aimed to spend another R127 million in 2006/07 to create local jobs while developing infrastructure that should result in improved economic activities. Shark-cage diving, boat-based whale watching and other non-consumptive tourism activities have been prioritised as means to address communities' social and economic needs. A draft policy on aquaculture was expected to be finalised and released for public comment in 2006.

In addressing the plight of bona fide small-scale fishers from coastal fishing communities, who use low-technology fishing gear to catch fish primarily for local sale or barter, fishers who demonstrate both great need and a historic dependency on fishing will be given access to fish and marine resources in inshore areas.

Fishers could be accommodated within the framework of subsistence fishing. A policy for subsistence fishing was expected to be released in 2006.

of off-road vehicles in coastal zones, monitoring of stretches of coast has indicated that the banning of off-road vehicles has enabled several shore-breeding birds, especially Damara tern and African black oystercatcher, to breed successfully on beaches again.

According to conservationists from Ezemvelo KwaZulu-Natal Wildlife, the number of loggerhead and leatherback turtles hatching successfully on the beaches of northern KwaZulu-Natal has also increased since the ban was enforced.

In 2004, the Department of Environmental Affairs and Tourism amended the Regulations for the Control of Use of Vehicles in the Coastal Zone, and developed a guideline document for these regulations. A socio-economic study was commissioned to determine the effects of these regulations in the St Lucia region. The study was expected to be completed in 2006.

Interpretive and Informative Marine and Coastal Signage Programme

As part of its education and training programme, the department seeks to raise awareness in coastal areas. Following extensive consultation, more than 90 different themed interpretive and informative boards were developed and erected at beaches all along the coastline after the reproduction of more than 1 000 copies. These are valuable tools for increasing coastal and marine-environment awareness among beach visitors.

Adopt-a-Beach

The Adopt-a-Beach Programme was initiated to

encourage groups of people to adopt or help look after a piece of coast in their region and link with others as part of a national project. Adopt-a-Beach is part of the overall Coastcare Programme and contributes towards the implementation of the awareness, education and training goals of the *White Paper for Sustainable Coastal Development in South Africa*. More than 250 groups have been registered and are being supported by the department.

Blue Flag Programme


Blue Flag is an international annual award given to beaches that meet excellence in the areas of safety, amenities, cleanliness and environmental standards. South Africa is the first country outside Europe to win Blue Flag accreditation for its beaches. Since the inception of the programme in South Africa, a 75% growth rate in full status and pilot Blue Flag beaches has been achieved.

The Blue Flag beaches for 2006/07 were:

- Addington Beach, Durban
- Anstey's Beach on the Bluff, Durban
- Bay of Plenty, Durban
- South Beach, Durban
- Umhlanga Rocks Main Beach
- Kelly's Beach, Port Alfred
- Well's Estate, north of Port Elizabeth
- Humewood, Port Elizabeth
- Dolphin Beach, Jeffrey's Bay
- Lappiesbaai Beach, Stilbaai
- Grotto Beach, Hermanus
- Bikini Beach, Gordon's Bay
- Mnandi Beach, Strandfontein
- Clifton 4th Beach, Cape Town
- Lucien Beach, south coast
- Marina/San Lameer Beach, south coast
- Ramsgate Main Beach, south coast
- King's Beach, Port Elizabeth
- Hawston Beach, near Hermanus
- Kleinmond Beach, near Hermanus.

Illegal cottages

The Department of Environmental Affairs and Tourism has embarked on a programme to halt illegal developments along coastal areas that compromise orderly developments and degrade the environment. Creating an environment conducive to the promotion of appropriate development, improving law enforcement and environmental quality, and ensuring that local communities benefit from orderly

 By June 2006, Operation Orca had resulted in the seizure of marine products worth almost R38 million, as well as 35 vehicles, three vessels and other assets. There had been 78 convictions, breakthroughs into four syndicate operations and the first-ever long-term imprisonment of seven years for the possession and transportation of perlemoen.

The environmental protection fleet inspected 714 vessels, undertook 13 rescue operations, secured 25 arrests and issued 50 fines in 510 sea days in 2005. The department aimed to increase the number of sea days to 700 with at least one Southern African Development Community patrol per quarter.

development along the coast are key objectives of this programme.

The department took action against illegal developers along the Eastern Cape coastline after aerial and ground surveys were done, resulting in more than 40 criminal cases and about 60 civil cases against individuals. After court orders and interdicts, 15 houses were demolished. The department is currently expanding legal action against developments in KwaZulu-Natal and the Northern Cape.

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 reform in biodiversity conservation, pollution, waste management and environmental planning.

Urban environmental management

South Africa is an urbanised economy with 58% of the population living in cities and towns. By 2015, it is expected that 68% of the population will live in urban areas due to continued migration from rural areas mainly to the larger cities, which will lead to many environmental challenges in South Africa's cities.

The launch of the five-year Urban Environmental Management Programme (UEMP) in June 2006 marked a milestone in environmental co-operation between Denmark and South Africa. With their latest donation of R275 million, Denmark passed the R1-billion mark in donations towards improving environmental quality in South Africa.

Five key municipalities have been chosen as pilots for this programme, namely Cape Town, Durban, Ekurhuleni, Johannesburg and Sedibeng (Vaal Triangle). Some R85 million has been earmarked for direct support to these cities with a reserve for other 'hotspots' in future. People living in air-pollution hotspots such as the Vaal Triangle and South Durban can expect noticeable improvements over the next five years.

It is expected that the UEMP will lead to an improvement in the quality of life of nearly two million poor households in these five municipalities, whose health is affected by inadequate waste removal, and

poor air quality and planning. It will contribute to economic growth by assisting cities to develop energy strategies and integrated development plans. The professional development of environmental health officers will also receive special attention.

National and provincial departments will receive R68 million to spread the lessons learnt and models developed that could lead to improvements in all municipalities.

Climatic and atmospheric change

In South Africa, climate change is evident and will continue, even if greenhouse gas (GHG) concentrations are stabilised. As such, it will continue to undermine sustainable development. Expanded desertification in the semi-arid areas of the country is already a feature of the South African landscape. Climate-change modelling suggests a reduction of the area covered by the current biomes in South Africa by 35% to 55% in the next 50 years.

The Energy Research Centre at the University of Cape Town has estimated that the yearly cost to South Africa of not acting to adapt to the effects of climate change now will be about 1,5% of gross domestic product (GDP) by 2050.

Achieving the 2013 additional renewable energy target of 10 000 giga watt hours could have a positive impact on GDP of more than R1 billion, lead to additional government revenue of almost R300 million, provide additional income to low-income households of R128 million, and produce water savings of up to 16,5 million kilolitres per year, while creating just over 20 000 new jobs simultaneously.

National Climate-Change Response Strategy

The strategy provides a comprehensive framework for dealing with climate-change issues in South Africa. The approach used in developing this strategy was to ensure, as far as possible, that climate-change response actions in South Africa facilitate sustainable development.

Government approved accession to the Kyoto Protocol of the UN Framework Convention on Climate Change (UNFCCC) in March 2002, demonstrating South Africa's commitment to further enhancing the effectiveness of environmental legislation.

The Kyoto Protocol, which entered into force on 16 February 2005, is a legally binding instrument whereby developed countries undertake to reduce GHG emissions by at least 5% of their 1990 levels.


One of the protocol's features is the incorporation of market-based mechanisms designed to allow developed countries to achieve their required emission reductions at the lowest possible cost.

The South African National Conference on Climate Change was held in October 2005 in Midrand near Johannesburg to address the growing challenge of climate change and to prepare for its implications. This was South Africa's first national conference on the topic. Attended by more than 600 representatives from government, the business sector, scientific and academic communities and civil society, the conference reflected South Africa's commitment and determination to act on climate change and to shape policy informed by the best available scientific knowledge.

In December 2005, envoys from more than 180 countries, including South Africa, attended the UNFCCC, held in Montreal, Canada, to discuss the Kyoto Protocol. More than 40 decisions that would strengthen global efforts to fight climate change were taken.

In December 2005, at the fourth Municipal Leaders Summit in Montreal, more than 190 mayors agreed to reduce emissions of GHGs by 20% before 2020, and by 80% by 2050, in support of the Kyoto Protocol.

South Africa is introducing the first carbon-development mechanism projects that use cleaner development to generate revenue from developed nations, to support the country's actions in response to climate change. Government also intends implementing the agreement it has with Business Unity South Africa on emissions, and using the National Environment Management: Air Quality Act, 2004 (Act 39 of 2004), to regulate the reporting of GHG gas emissions, and encourage cleaner production.

 In June 2006, ministers and heads of delegations from 22 countries met at Kapama Lodge, South Africa, for the Ministerial Indaba on Climate Action. The indaba provided ministers with the opportunity to consider key issues for the climate-change agenda for the long term, as well as for the next round of talks under the United Nations Framework Convention on Climate Change and its Kyoto Protocol scheduled in Nairobi, Kenya, in 2006.

Erosion and desertification

Most South African soil is unstable. The country loses an estimated 500 mt of topsoil annually through erosion caused by water and wind.

About 81% of the total land area of South Africa is farmed. However, only 70% of this area is suitable for grazing.

Overgrazing and erosion diminish the carrying capacity of the veld and 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 being 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 its consequences. These countries support one another at technical and scientific level, as they share similar climatic conditions.

South Africa also acts as co-ordinator 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, among other things, to foster scientific and technological co-operation.

Waste management

The Department of Environmental Affairs and Tourism has prioritised four projects within the framework of the National Waste Management Strategy. They are:

- recycling
- a waste information system
- healthcare waste
- capacity-building.

Central to these are pilot projects that are being set up countrywide. The department welcomes partnerships with business to ensure that these projects are successful and become a core of better waste management in South Africa.

In 2006, the new National Integrated Waste Management Bill, which ensures that waste is dealt with according to agreed norms and standards, was published for comment.

Government aims to reduce the amount of 'big five' waste – plastics, cans, paper, glass and tyres – that reaches landfills by 70% by 2022, and has plans for minimising and treating the remaining 30%. National initiatives embarked on to realise the goal of zero waste, include agreements signed by government and members of priority waste-stream sectors such as the manufacturers of plastic bags and the waste-glass industry, and an MoU with the waste-tyre sector.

An agreement containing regulations governing plastic shopping bags was signed in September 2002 by the Minister of Environmental Affairs and Tourism and representatives from various labour and business organisations.

The agreement, which came into effect on 9 May 2003, stipulates that the thickness of plastic bags be 30 microns. However, manufacturers will be allowed to continue using their existing machinery to make bags of 24-micron thickness for the next five years before having to comply with the 30-micron standard.

The agreement states that printing will only be allowed on 25% of the surface area of plastic bags if the ink is not environmentally friendly. In situations where the ink is acceptable, this area can be increased to 50%. The department has a toll-free line to deal with queries about plastic bags.

The plastic bags agreement and supporting regulations have dramatically decreased the environmental impact of this highly visible waste stream, with a 50% reduction in the consumption of plastic bags since the introduction of the regulations.

As part of the implementation of the plastic bag regulations, Buyisa-e-Bag, a non-profit-making company was set up to promote waste minimisation and awareness initiatives in the plastics industry. The company is expected to expand collector networks and to create jobs, as well as to kick-start rural collection SMMEs and create additional capacity in NGOs.

Work is in progress to follow this success with targeted and customised agreements in respect of other problem waste streams, including tyres and glass.

The compliance and enforcement of the regulations have been assigned to the South African Bureau of Standards.

The Radioactive Waste Management Policy, which assures citizens that there is a nuclear waste-management plan and strategy, is being implemented, starting with the creation of the National Committee on Radioactive Waste Management.

Water-quality management

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

Water-quality management involves maintaining water resources for use on a sustained basis, by achieving a balance between socio-economic development and environmental protection. From a regulatory point of view, water-quality management entails the ongoing process of planning, development, implementation and administration of water-quality management policy; the authorisation of water-uses that have, or potentially have, an impact on water quality; as well as the monitoring and auditing of the aforementioned.

The National Water Act, 1998 (Act 36 of 1998), further enables the Department of Water Affairs and Forestry to manage water quality through source-directed and resource-directed measures.

Following the Department of Justice's closure of all specialised courts in July 2006, all environmental cases now have to be heard in their own districts.

The departments of environmental affairs and tourism and of justice and constitutional development established a dedicated unit as from 1 August 2006 to deal with all cases in the Western Cape. The Department of Environmental Affairs and Tourism seconded officials to a unit that would prosecute cases in district and regional courts, and in the High Court.

By the end of 2006, over 100 prosecutors had completed specialised training in prosecuting marine-, wildlife- and pollution-related environmental crimes.

Source directed measures include the issuing of licences to water users with a potential impact on the resource.

The Act requires that all significant water resources be classified in accordance with the prescribed classification system. (See Chapter 23: *Water affairs and forestry*.)

The department is introducing a comprehensive drinking-water management programme to help municipalities ensure that the quality of drinking water is managed appropriately. Municipalities submit monthly reports on the quality of their drinking water to the department to enable it to lend speedy assistance when necessary.

Air pollution

The National Environment Management: Air Quality Act, 2004 was promulgated in 2005. The Act, which repealed the Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965), gives effect to the integrated pollution and waste-management policy to ensure that all South Africans have access to clean air.

In 2006, government introduced the first-ever South African National Standards for Ambient Air Quality. These are specifically aimed at protecting peoples' right to air that is not harmful to health and well-being, and at defining specific levels of air pollution like benzene, sulphur dioxide and particulate matter that are considered harmful. The department also hosted the first annual National Air Quality Governance Lekgotla in October 2006 to address air-quality issues and to help ensure cleaner air in all communities.

Marine pollution, poaching and sustainability

South Africa has one of world's busiest shipping routes and has experienced many oil spills over the years. It is estimated that 80% of the world's tanker

traffic passes South Africa's coast. The department developed the National Contingency Plan for the Prevention and Combating of Pollution from Ships, in consultation with the South African Maritime Safety Authority and the Department of Transport. This includes disposal, recovery or stabilisation of the spilled oil and the rehabilitation of the environment.

The department successfully responded to several pollution incidents, which included, among others, the *Sea Elegance*, *Sealander Express*, *Cape Africa*, and *BBC China*. The department established the National Ballast Water-Management Task Group to develop measures aimed at regulating discharges of ballast water in South Africa's marine and coastal waters.

Sustainable Coastal Livelihoods Programme (SCLP)

The SCLP seeks alternative livelihood options for communities along the South African coast to minimise pressure on marine resources. By mid-2006, 14 SCLP coastal-development projects were being implemented with a total budget of R13,4 million.

Subsistence fishing


The implementation of the Marine Living Resources Act, 1998 (Act 18 of 1998), has facilitated the allocation of formal rights to fishers in this sector for the first time. It is an important part of the overall transformation of fisheries in South Africa. A primary goal is to allow subsistence fishers to obtain their food, or food security, through the harvesting of local resources. Consequently, the need to ensure that exploitation is sustainable is vital.

Identifying and working with fisher communities to promote orderly access has been emphasised. Implementation involves co-operation between all spheres of government and civil society.

A policy for subsistence fishing was expected to be released in 2006.

Protecting South Africa's seas

To counter illegal activities along the 3 000-km coastline, as well as the country's 1 155 000 km² Exclusive Economic Zone (EEZ), the Department of Environmental Affairs and Tourism has boosted its compliance unit with the appointment of more than 80 fishery control officers (FCOs) and 100 honorary FCOs, after the implementation of the Honorary Fishery Control Officers Policy. The department has

 At the Reduce, Reuse and Recycle Ministerial Conference in 2005, South Africa agreed to manage waste in a holistic manner, and became one of seven countries to sign a grant agreement on the African Stockpile Programme with the World Bank worth US\$1,7 million. The country is also developing guidelines for the implementation of the Globally Harmonised System of Classification and Labelling of Chemicals.

also taken delivery of four new environmental-protection vessels as part of measures to protect marine and coastal resources.

Three of the four new protection vessels, *Lillian Ngoyi*, *Ruth First* and *Victoria Mxenge*, have been built to patrol up to the 200 nautical mile limit from the shore. A fourth vessel, *Sarah Baartman*, patrols the most remote reaches of the EEZ and around the Prince Edward islands in the Southern Ocean regions. The vessels also conduct multilateral patrols in the Southern African Development Community (SADC) coastal states.

Lillian Ngoyi was launched in November 2004, followed by *Sarah Baartman* on 10 January 2005, *Ruth First* on 18 May 2005 and *Victoria Mxenge* on 23 September 2005.

In addition to performing fishery-protection duties, the vessels are equipped to conduct oil-spill countermeasure operations. The vessels are further equipped for search-and-rescue work, fire-fighting and limited towing duties.

They monitor a wide variety of resources, including rock lobster, abalone, line fish and squid, and carry out inspections of the demersal and pelagic fleets.

Three of the vessels are 47 m long and 8 m wide and can reach a top speed of about 25 knots (about 40 km per hour), which is roughly twice the speed necessary to catch most poachers.

The much-larger *Sarah Baartman* carries 18 crew members, four cadets and seven fishery inspectors.

Her top speed exceeds 20 knots. Equipped with a helicopter deck and refuelling facilities, *Sarah Baartman* can accommodate a fully laden Super Puma or Oryx helicopter. It also has hospital facilities and capacity for six 20-foot containers, which can be loaded and discharged by the vessel's own crane.

The patrol vessels are named after women who, through their courage, dedication and commitment, made a significant contribution to South Africa's liberation.

The *Florence Mkhize* speed-vessel was introduced in June 2006 to assist in combating poaching. The vessel is extremely fast (with speeds in excess of 60 knots) and consists of twin 820 kilowatt engines. It is certified as less than 25 ton and is 14 metres in length. The total cost of the vessel was R3,8 million.

The department launched the Preventative Enforcement Strategy in November 2005.

In the Eastern Cape alone, the number of abalone confiscated declined dramatically during the period from October 2005 to January 2006. In October 2005, 52 336 abalone were confiscated and at the end of November 2005 this figure had dropped to 6 926, representing a decrease of about 600%.

The figure for December 2005 and January 2006 combined was 3 216, representing a further 100% decrease. A total of 1 200 alleged poachers were prevented from diving.

Inspections were also carried out at restaurants, fish factories and shops, and commercial fishing boats at landing sites.

International co-operation

International alliances are essential for encouraging regional and international compliance with marine fisheries legislation. South Africa has played a positive role in responding to international requests to help when dealing with alleged illegal, unreported and unregulated vessels. The request at the end of 2003, from Australia, to assist in the pursuit of the *Viarsa I* is the most prominent example of this kind. The vessel was alleged to have been involved with illegal harvesting of Patagonian toothfish in Australia before she fled to the high seas in the direction of South Africa.

Vessel monitoring

The department is making it obligatory for fishing vessels to have satellite technology on board so that it can monitor their movements. Five coastal nations in the SADC have taken the innovative step of linking their vessel-monitoring systems. South Africa, Namibia, Angola, Mozambique and Tanzania

In March 2006, the Deputy Minister of Environmental Affairs and Tourism, Ms Rejoice Mabudafhasi, launched the International Year of Deserts and Desertification. She announced that the Madibaneng Soil Conservation Project (MSCP) would receive R5 million in funding. The MSCP is an innovative project that aims to rehabilitate agricultural land while introducing measures for controlling soil erosion and improving the management of grazing.

have signed an MoU that will allow them to share information about the movement of licensed boats in southern Africa.

Partnerships

To further counter illegal fishing and corruption, the department entered into partnerships with a broad spectrum of agencies, including national, provincial and local government, as well as NGOs. Co-operation ensures that resources are used more effectively, resulting in a number of high-profile prosecutions and convictions.

Other important partnerships have been forged with specialised units of the South African Police Service. In addition, SANParks and a number of provincial nature-conservation agencies conduct monitoring, control and surveillance activities within the MPAs.

Ecosystem Approach to Fisheries Management (EAFM)

In line with the Johannesburg Plan of Implementation, the department has begun to explore implementation of the EAFM. The purpose of an EAFM is to plan, develop and manage fisheries in a manner that addresses the multiplicity of societal needs and desires, without jeopardising the options for future generations to benefit from the full range of goods and services (including fisheries and recreational opportunities) provided by marine ecosystems.

Good progress has been made through national and regional initiatives in implementing practical measures to mitigate against the negative effects of fisheries on the ecosystem.

Transboundary research collaborations

The department has launched a project (as part of a regional initiative) to investigate the feasibility of an EAFM in the Benguela Current Large Marine Ecosystem (BCLME) region, by examining the existing issues, problems and needs related to EAFM, and developing different management and options to achieve sustainable management of resources at an ecosystem level. The BCLME Programme is a management-orientated programme aimed at boosting the infrastructure necessary to address cross-boundary problems associated with fishing, mining, oil exploration, coastal development, biodiversity and pollution.

Another programme implemented by the department is the scientific arm of BCLME, the Benguela Fisheries Interaction Training (Benefit) Programme. Benefit is a joint initiative between South Africa, Namibia and Angola to address fisheries and other marine scientific investigations of important living-marine resources and their interactions with the environment. Training staff to undertake research and to achieve the levels of expertise necessary to provide advice to fisheries' management is also an important objective of Benefit. Both the BCLME and the Benefit programmes are seen as New Partnership for Africa's Development (Nepad) initiatives, and are supported by SADC as regional projects.

West Indian Ocean Land-Based Activities Project (WIO-LaB)

WIO-LaB was launched at Robben Island on 5 November 2004. The WIO-LaB Project deals with the protection, prevention and management of marine pollution from land-based activities.

The commitment given to this project by the main donors, the United Nations Environmental Programme (UNEP) and the GEF, resulted in the appointment of a regional project manager in February 2000.

The department is assessing the effect that litter from rivers has on the oceans, is raising awareness of and educating communities about the importance of protecting the marine environment from pollution resulting from land-based activities, and has created task teams to deal with municipal water and the physical alteration and destruction of habitats.

National Policy for Seals and Seabirds

The National Policy for Seals and Seabirds in South Africa, and the National Plan of Action for Seabirds,



At the end of 2005, marine scientists from the Department of Environmental Affairs and Tourism were among a group of international scientists following a great white shark crossing the Indian Ocean from South Africa to Australia (within 99 days) and back. A device was temporarily attached to the shark that communicated information to a satellite. This research demonstrates the first link between two of the most important and widely separated populations of great white sharks. It also highlights the first-known round trip by an individual shark, and the fastest return trip across an ocean by any marine organism.

for reducing the incidental catch of seabirds in longline fisheries, have been finalised.

This follows growing concern over the numbers of seabirds, especially albatrosses, being killed by longline vessels in southern Africa. The plan sets out the required mitigation measures to reduce mortality of seabirds to below an interim target level of 0,05 birds/thousand hooks by South Africa's longline fisheries for hake, tuna, swordfish, Patagonian toothfish and sharks.

South Africa ratified the Agreement on the Conservation of Albatrosses and Petrels (ACAP) in November 2003. It is a multilateral agreement that seeks to conserve albatrosses and petrels by co-ordinating international activity to mitigate known threats to albatross and petrel populations. South Africa played a key role in negotiating the ACAP, and is home to many important populations of these seabirds, including those on the sub-Antarctic Prince Edward islands.

Research observer scheme

The department introduced a formal research observer scheme for the following fisheries: deep sea hake trawl; inshore hake trawl; hake longline; pelagic purse seine; South Coast rock lobster; KwaZulu-Natal prawn trawl; large pelagics (experimental); horse mackerel midwater trawl; and deep sea experimental fisheries. This observer scheme provides valuable research data on, among other things, these fisheries' influence on the ecosystem.

Chemicals

Although relatively small by international standards, the chemical industry is a significant player in the South African economy, contributing about 5% to GDP and providing employment to about 200 000 people. The industry produces 1 301 t of primary and secondary process chemicals annually, making it the largest of its kind in Africa.

Several steps have been taken to align current legislation with the Constitution of the Republic of South Africa 1996 (Act 108 of 1996), as well as with global chemicals management:

- A special unit has been set up in the Department of Environmental Affairs and Tourism to implement a system aimed at preventing major industrial accidents, as well as systems for emergency preparedness and response.
- The minister has initiated an integrated safety, health and environment approach for the

management of chemicals in South Africa. This government-level initiative, funded by the UN Institute for Training and Research, will involve a multistakeholder forum, including labour representatives, aimed at integrating legislation.

South Africa has signed the Stockholm Convention on Persistent Organic Pollutants and the Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. It also played a part in the process of developing guidelines for the implementation of the Globally Harmonised System of Classification and Labelling of Chemicals.

Recycling

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

Collect-a-Can celebrated its 13th birthday in April 2006. Thanks to its efforts, the recycling of cold drink cans increased from 18% in 1993 to 66% in 2003. This is higher than the recycling rate in the USA and the European Union.

According to a survey conducted by Collect-a-Can, more than 37 000 people earn a living by picking up cans for recycling.

The glass industry in South Africa has taken a proactive stance in driving glass recycling by agreeing on a model of self-regulation. This will involve a section 21 company being established and managed according to guiding principles laid down in the Glass MoU, signed on 19 May 2005.

The MoU evolved from extensive research, consultation and negotiation, and enjoys the support of the National Glass Recycling Forum, which includes the entire waste-glass value chain, as well as consumer groups. The initiative aims to increase glass-recycling levels from 20% to 50% a year in less than five years.


The official signing of the MoU also marked the launch of a comprehensive national recycling campaign aimed at addressing the challenges posed by waste glass in the environment.

Environmental injustices

The negative effect of asbestos on the environment and other environmental-injustice issues are a priority for the Department of Environmental Affairs and Tourism.

Efforts being undertaken by the South African Government to deal with the asbestos problem include:

- eradicating mine-dumps
- developing occupational health and safety regulations on asbestos
- developing safety standards and establishing a single compensation office
- formulating a code of best practice for the maintenance, demolition and disposal of asbestos-containing material
- abolishing the use of asbestos in road construction
- gradually phasing out asbestos-use in housing.

 In 2006, the draft Threatened and Protected Species Regulations, and the draft National Norms and Standards for the Regulation of the Hunting Industry, concerning the breeding, trade, transport and hunting of threatened and protected species in South Africa were introduced, establishing uniform national systems that will apply the same standards countrywide.

This improves on the management of environmental resources according to provincial ordinances, which is often inconsistent, and ends activities such as canned hunting, illegal trade and unethical breeding.

The Department of Environmental Affairs and Tourism now issues lists of nationally threatened and protected species, and requires that permits be obtained for all breeding, hunting, trade and transport of listed species, thus effectively banning intensive breeding of listed large predators such as the wild dog, cheetah, lion and leopard for hunting or sale for hunting, and requires that all captive-breeding facilities, nurseries, scientific institutions, sanctuaries and rehabilitation facilities be formally registered. The Scientific Authority was also established in 2006 to help regulate and restrict trade in specimens of protected species.

Hunting by humane methods and in accordance with strict fair-chase principles by hunters registered with recognised hunting bodies is permitted. For better management of protected species, the South African National Biodiversity Institute maintains the National Hunting Register of animals that have been hunted, for what purpose, where and by what method.

International co-operation

The department promotes South Africa's interests by participating in a number of international commissions, such as the International Commission for the Conservation of Atlantic Tunas, the Commission for the Conservation of Antarctic Marine Living Resources, and the International Whaling Commission.

The following important instruments have been acceded to, or ratified:

- Agreement for the Implementation of the Provisions of the UN Convention on the Law of the Sea on 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (Straddling Stocks Agreement)
- ACAP
- Convention for the Protection, Management and Development of the Marine and Coastal Environment of the East African Region and Related Protocols (Nairobi Convention)
- Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region and Related Protocol (Abidjan Convention)
- SADC Protocol on Fisheries.

United Nations Framework Convention on Climate Change

South Africa ratified the UNFCCC in 1997. The convention is a global commitment to take collective responsibility for climate change, and is a mandate for action to address the problem.

The convention was signed at the Rio Earth Summit in 1992 by heads of state and other senior representatives from 154 countries (and the European Community), and came into effect on 21 March 1994. Since mid-1998, some 175 states have ratified or acceded to the convention.

The objective of the convention is to stabilise GHG concentrations in the atmosphere at a level that will not have an adverse effect on the climate.

The convention aims to control this level over a period of time, to:

- allow ecosystems to adapt naturally to climate change
- ensure that food production is not threatened
- enable economic development to proceed in a sustainable manner.

All countries that have ratified the convention are required to:

- develop, update and publish national inventories of anthropogenic emissions by sources, and removals by sinks of GHG (the GHG excludes those listed in the Montreal Protocol)
- formulate, implement and update national and regional programmes containing measures to mitigate climate change
- promote and co-operate in the development and transfer of technology that controls, reduces or prevents anthropogenic emissions of GHG
- promote sustainable management, conservation and enhancement of sinks and reservoirs of GHG
- co-operate in preparing for the adaptation to the impact of climate change
- take climate-change considerations into account where feasible, in relevant social, economic and environmental policies and actions, to minimise the adverse effects on the economy, on public health and on the quality of the environment
- promote and co-operate in the timeous and transparent exchange of information, including scientific, technological, socio-economic and legal information and research
- promote and co-operate in education, training and public awareness
- report to the Conference of the Parties.

Convention on International Trade in Endangered Species (Cites)

Cites, also known as the Washington Convention, was negotiated in 1973 when it was realised that international trade in wildlife and wildlife products could lead to the overexploitation of certain species, thereby threatening them with extinction.

Cites came into force in South Africa on 13 October 1975. South Africa, together with the other 149 member countries, acts by regulating and monitoring international trade in species which are, or may be, affected by this trade.

Montreal Protocol

South Africa, as a signatory to the Montreal Protocol, has a national obligation to safeguard the ozone layer from depletion.

South Africa has phased out chlorofluorocarbons (CFCs), halons, methyl chloroform and carbon tetrachloride – making it the only developing country in the world that has achieved so much in line with

the phase-out schedule for developed countries. Although South Africa is classified as a developing country, its consumption of these substances is equal to that of some developed countries.

To demonstrate the country's commitment towards the phasing out of ozone-depleting substances (ODSs), the following control measures constitute the overall position of South Africa on the Montreal Protocol:

- working groups were constituted to assist government in implementing the protocol
- regulated ODSs can only be imported or exported after applying for an import/export permit through the Department of Trade and Industry under the Import and Export Control Act, 1963 (Act 45 of 1963)
- ODSs can only be imported after an environmental levy of R5 per kg of CFC has been paid
- information is disseminated to interested and affected parties
- Africa network meetings, as arranged by UNEP, are attended, where views, experiences and problems are shared to improve co-operation within the region and as per Nepad requirements.

Obligations include:

- ensuring that South Africa, as a party to the protocol, protects human health and the environment against harm from human activities that modify or are likely to modify the ozone layer
- ensuring the protection of the ozone layer by taking precautionary measures to equitably control total global emissions of substances that deplete the ozone layer, with the ultimate objective of totally eliminating them
- reporting and sending to the Ozone Secretariat data on production, imports, exports and consumption of regulated ODSs as collected from dealers and relevant departments.

The Department of Environmental Affairs and Tourism has embarked on a national project to establish methyl bromide consumption trends, and a database of suitable, feasible and economically viable alternatives to methyl bromide. This document will form the basis for an intensive research/evaluation project to phase out, in the short term, 20% of methyl bromide usage, mainly in the agricultural sector.

As of 1 January 2005, all developing countries were to reduce their respective methyl bromide consumption by 20%, as per the phase-out timetable.

Private-sector involvement

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

- BirdLife South Africa
- Botanical Society of South Africa
- Centre for Rehabilitation of Wildlife
- Conservation International
- Delta Environmental Centre
- Dolphin Action Protection Group
- EcoLink
- Endangered Wildlife Trust
- Green Trust
- Keep South Africa Beautiful
- National Conservancy Association of South Africa
- Peace Parks Foundation
- South African National Foundation for the Conservation of Coastal Birds
- Trees and Food for Africa
- Wildlife and Environment Society of South Africa
- Worldwide Fund for Nature South Africa.

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National Zoological Gardens of South Africa

South African National Biodiversity Institute

South African National Parks

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