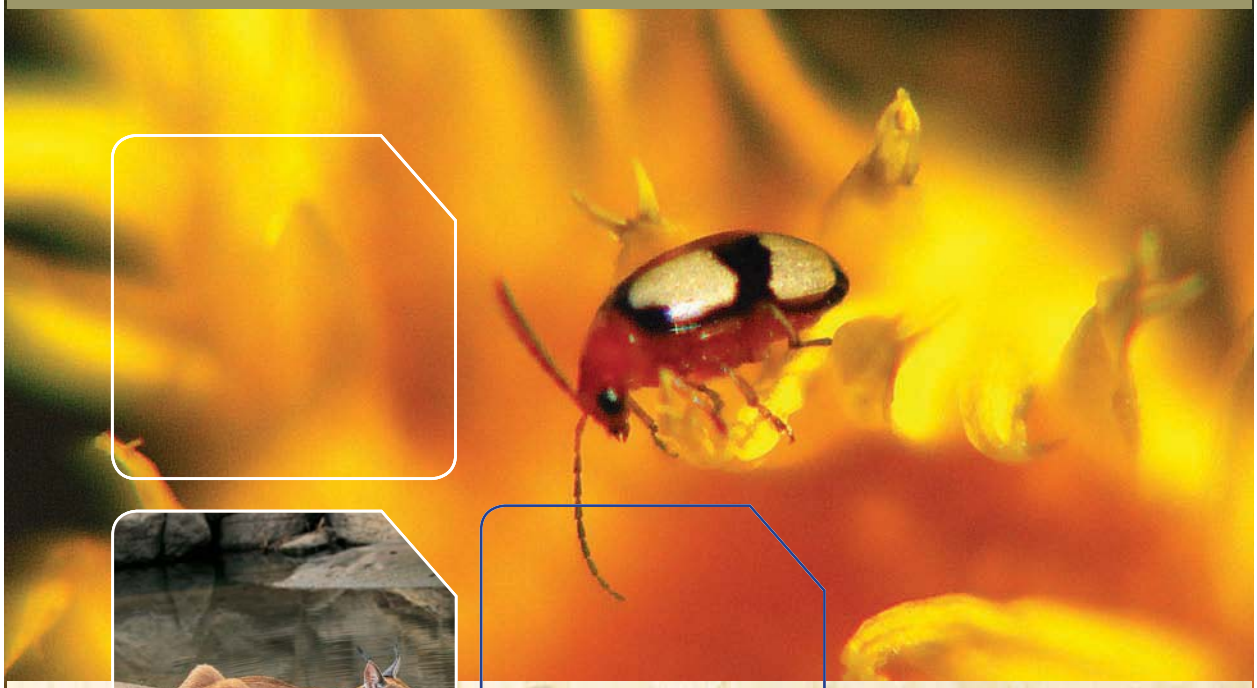

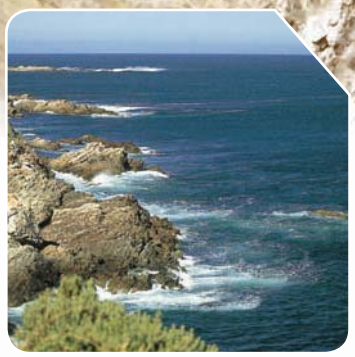

South Africa's trove of natural treasures and beauty is unmatched. Although South Africa accounts for only 2% of the world's surface area, it is home to nearly 10% of the world's plants and 7% of the world's reptiles, birds and mammals. In terms of the number of endemic species of mammals, birds, reptiles and amphibians, South Africa is ranked as the fifth richest country in Africa and the 24th richest in the world.

The overarching vision of the Department of Environmental Affairs and Tourism is a prosperous and equitable society living in harmony with its environment and natural resources. The department manages policies governing four interrelated components: tourism, the fishing industry, conservation management of natural resources and the environment and substantial development.

The department's objective is to maximise economic growth in these sectors while effectively managing the interface between the environment and development. Futhermore, the department also leads the environment and culture sector of the Expanded Public Works Programme (EPWP), and promotes the 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.

Improved environmental conditions include certain fish stocks, which have recovered due to good management measures, and a slowing of habitat loss in some areas of the country.

Programmes to rehabilitate ecosystems while creating jobs have received increased budgets.

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 (1997)*, and multilateral agreements such as the United Nations (UN) Convention on Biological Diversity (CBD), which came into force in December 1993.

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 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 of these. 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, fresh water 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, such as a provincial parks authority. Steps have been taken to ensure that standards are upheld.

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

Regulations pertaining to threatened and protected species came into effect on 1 February 2008. They seek to regulate the hunting of large predators and address illegal and unethical hunting methods and devices.

related to the World Heritage Convention (the other being Australia), which was adopted by the UN in 1972.

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.

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 will incorporate decisions taken by world bodies since the Rio Earth Summit in 1992.

Among the achievements 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.

The eighth International Conference on Environmental Compliance and Enforcement was held in Cape Town in April 2008.

Two days were dedicated to local capacity-building and regional networking events. The subsequent days featured action-oriented thematic workshops, distinguished keynote speakers and networking opportunities for over 150 invited participants. It also included a day for field visits to sites of innovative environmental enforcement initiatives in South Africa.

Established in May 2005 in the Department of Environmental Affairs and Tourism South Africa's Environmental Management Inspectorate, popularly referred to as the "Green Scorpions", has made significant strides in the area of environmental enforcement. The capacity of the Green Scorpions has increased from the initial 26 to a total of 866 inspectors countrywide.

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

- 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 Framework for Sustainable Development (NFSD)

In July 2008, Cabinet approved the NFSD and the intention to develop an in-depth implementation plan for sustainable development in the country.

In the Johannesburg Plan of Implementation (JPoI), negotiated at the WSSD, countries committed to preparing and implementing national strategies for sustainable development.

In line with the WSSD targets, the Department of Environmental Affairs and Tourism led a process towards the development of a single, coherent framework that articulates South Africa's development context, and sets out the common vision and strategic areas of intervention for achieving sustainable development. Phase one of a three-phase process, through a series of dialogues, has culminated in the development of the NFSD.

The NFSD seeks to build on existing programmes and strategies that have emerged in the first 15 years of democracy. It sets the framework for a common understanding and vision of sustainable development, describes the South African context and defines areas for strategic intervention. The NFSD complements current efforts aimed at reducing poverty and growing the economy. It enhances the need for coherence and consideration of natural resource constraints and ecosystem services.

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 (1997)*, over 10 000 plant and animal species – almost 15% of the coastal species known worldwide – are found in South African waters, with about 12% of these occurring nowhere else.

The 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. The Cape Floral Kingdom 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 are 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.

Imporant dates:
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.

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, iSimangaliso Wetlands Park (formerly Greater St Lucia Wetlands Park) and other reserves are located in the Savanna Biome.

Nama-Karoo Biome

This biome includes the Namaland area of Namibia, and the central 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 Augrabies 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

The Grassland Biome covers an estimated 339 237 km of South Africa's landscape and stretches across seven of the country's nine provinces. This biome is a summer-rainfall area with heavy thunderstorms and hail in summer, and frost in winter.

In July 2008, the Grasslands Declaration was signed by the Minister of Environmental Affairs and Tourism, Mr Marthinus van Schalkwyk, and six provincial MECs for environmental affairs. The Grassland Biome is South Africa's significant food source, water purifier and the second-largest biome in the country in terms of size, species richness and heritage. It is also one of the most threatened areas in the country. Thirty percent of this area is already damaged beyond repair and cannot be conserved. Less than 2% of the biome is formally protected.

The grasslands programme was initiated to secure and sustain the biodiversity and ecosystems of the grasslands for current and future generations. One of the aims of the programme is to incorporate biodiversity in food production, urban development and the usage of land, especially for mining and plantation forestry.

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.

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 as well as the new Hantam National Botanical Garden outside Nieuwoudville in the Northern Cape have improved the conservation status of this biome considerably.

The Succulent Karoo Biome includes 2 800 plant species at increased risk of extinction.

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 ever-green 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 loerie, 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.

The Thicket Biome is centred predominantly in the Eastern Cape.

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, game and nature reserves and national botanical gardens. 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 towards maintaining South Africa's unique biodiversity is incalculable.

The publication in 2006 of the National Spatial Biodiversity Assessment (NSBA) by the Department of Environmental Affairs and Tourism and Sanbi, revealed that 34% of South Africa's ecosystems were threatened, with 5% critically endangered; while 82% of the 120 main rivers were threatened and 44% critically endangered. Of the 13 groups of estuarine biodiversity, three are in

The 12th session of the African Ministerial Conference on the Environment (AMCEN) was held in June 2008 at the Sandton Convention Centre, Johannesburg. During the conference, the "Africa: Atlas of our Changing Environment", was launched. The atlas is the first major publication to depict environmental change in Africa's countries using satellite imagery, and is a resource for remedial action at all levels.

South Africa has assumed the chair of AMCEN for the next two years, which will provide an opportunity to raise the profile of global environmental issues in Africa. It will represent Africa at international environmental meetings.

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 policies, plans and programmes.

South Africa's National Biodiversity Strategy and Action Plan (NBSAP) 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 conserves 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.

Mossel Bay's Oystercatcher Trail and the Cape Nature Tierkloof Trail in the Gamkaberg Reserve are among the 30 spectacular walks included in *Unforgettable Walks to Take Before You Die*. The 256-page book is authored by photographers and writers Steve Watkins and Clare Jones and draws on their collective years of international travel experience.

The Oystercatcher Trail is a three- or five-day walk along the largely undisturbed coastline west of Mossel Bay. The trail leads southwards towards the Gouritz River Mouth.

Now a major tourist attraction in Mossel Bay, this popular trail has earned itself a series of local and international accolades. Among these is a place in *Getaway's* Top 10 South African hikes as well as a spot in *National Geographic Traveller's* Top 50 Tours of a Lifetime.

The Gamkaberg Rerserve is situated within the Gamka Mountain in the Little Karoo. The mountain boasts a rugged terrain with deep ravines.

The Tierkloof Trail takes hikers through a deep, forested ravine to a fynbos-rich mountain plateau where hikers can rest in the Oukraal camp and look out on to the Swartberg and Outeniqua mountain ranges.

South African Biodiversity Information Facility (Sabif)

The Global Biodiversity Information Facility (GBIF) is a mega-science facility that aims to make the world's biodiversity data freely and openly available on the Internet.

South Africa became a voting participant of the GBIF in 2003, committing itself to establishing national nodes that are linked to the GBIF.

Sabif represents a partnership of more than four South African data-providers, including other role-players such as the Council for Scientific and Industrial Research, South African Integrated Spatial Information System, South African Society for Systematic Biology, Endangered Wildlife Trust, Biobank South Africa or Wildlife Biodiversity Resources, the Biomap initiative and museums.

Through Sabif, South Africa is able to respond to pertinent biodiversity challenges through innovative applications of information technology.

Sabif intends to create an enabling platform for end users to discover and put to use vast quantities of global biodiversity data to:

- advance scientific research in many disciplines
- promote technological and sustainable development
- facilitate the equitable sharing of the benefits of biodiversity
- enhance the quality of life of members of society.

South African Biosystematics Initiative (Sabi)

Sabi aims to take a leading role in the application of innovative approaches to systematics and taxonomy as fundamental sciences underpinning biological research.

In this way, it plans to unlock the full potential of South Africa's biological and human resources through the enhanced practice of biosystematic science, and to use modern technology to build on an existing rich historical scientific legacy, including indigenous knowledge systems.

Some of Sabi's primary objectives include establishing a framework and strategy to:

- address the diminishing national capacity in biological systematics and taxonomy
- provide leadership and co-ordination to

promote innovative research in the field of biosystematics
- empower South African biosystematists to employ and develop modern scientific technologies and approaches regarding the documentation and use of biological resources
- enhance the ability of South African biosystematists to contribute to the National System of Innovation and the information society, and thus respond to national priorities in agriculture, health, sustainable development and conservation.

South African Environmental Observation Network (SAEON)

The SAEON is a facility of the National Research Foundation (NRF). Its main aim is to establish and maintain environmental observatories, field stations and sites, linked by an information-management network, to serve as research and education platforms for the long-term study of ecosystems. It provides for incremental advances in understanding ecosystems and the ability to detect, predict and react to environmental changes.

The SAEON satisfies the need for public-decision support by generating long-term information relevant to the sustainable management of natural resources and habitats over a spectrum of eco-regions and land uses, ranging from pristine to urbanisation-transformed landscapes.

Wildlife Biodiversity Resources or Biobank South Africa

With the growing global market in biomaterial and biodiversity informatics, developing countries such as South Africa face the enormous challenge of setting up systems for governing access to biodiversity and the sustainable use of their biodiversity heritage.

The biosciences field is recognised as the driving force behind the next revolutionary wave of scientific and technological advancement.

Biobank facilities (genebanks) are increasingly becoming a key strategic research infrastructure for countries worldwide. Their importance in the conservation and sustainable use of biodiversity has, among other things, been emphasised in the Consolidated Plan of Action for Science and Technology.

This has led to the Department of Environmental Affairs and Tourism collaborating with Wildlife Biodiversity Resources or Biobank South Africa to help facilitate, through its member organisations, an integrated and co-ordinated drive to access, collect, enhance and bank a representative range of biomaterial from key South African and African wildlife and indigenous livestock species for conservation, research and biotechnology development purposes.

This facility also provides general custodianship to South Africa's wildlife biomaterial and/or genetic resources.

Genebanks

The Department of Science and Technology and the Agricultural Research Council (ARC) support the maintenance, management and development of national public assets for the benefit of the broader science community.

They are national repositories of genetic information and terrestrial data related to the environment, and include specimens of and facilities that house all insects and support arachnids, nematodes, fungi and various other genebanks.

South Africa has international obligations that compel it to keep reference collections of all agricultural specimens regarding the import and export of agricultural produce.

The national collections and genebanks house these reference collections and make an important contribution to scientific studies, biodiversity replenishment, sustainable development and production, food security and invader-pest identification.

South African National Biodiversity Institute

Sanbi, with its head office based at the Pretoria National Botanical Garden, was established in September 2004. It 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 April 2008, the Norwegian Government pledged R1,2 million to help Johannesburg host a "green" 2010 World Cup. The funds will be used to plant trees and consequently counteract carbon emissions in the city. Norway's government has also committed R750 000 for a feasibility study of a carbon-offsetting programme in partnership with the Department of Environmental Affairs and Tourism.

Sanbi's strategic focus for the medium term will be on:

- providing leadership in biodiversity knowledge management, information-generation and dissemination and highlighting the status and trends in South Africa
- conducting co-ordinated research on South Africa's biodiversity
- managing a national system of bioregional programmes
- implementing priority components of the national biodiversity strategy and action plan
- providing continued support for the Southern African Development Community (SADC) and New Partnership for Africa's Development (Nepad) and multilateral environmental arrangements
- further developing and managing national botanical gardens
- monitoring biodiversity in South Africa
- providing guidelines and best practices on the identification and conservation of threatened species and ecosystems, and the sustainable use of biodiversity.

In addition, Sanbi implements rehabilitation programmes that systematically target threatened ecosystems and continues to support the goals of the EPWP.

To achieve its goals, Sanbi has established five operational divisions, namely, Biosystematics Research and Collections; Applied Biodiversity Research; Climate Change and Bio-Adaptation; Biodiversity Mainstreaming; and Conservation, Gardens and Tourism.

Conservation, Gardens and Tourism

Sanbi manages nine national botanical gardens (classified as "conservation gardens") in six of South Africa's nine provinces. The gardens collectively attract over 1,25 million visitors a year, are signatories to the International Agenda for Botanic Gardens in Conservation, which was launched in 2000 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. Kirstenbosch National Botanical Garden, as part of the Table Mountain National Park (TMNP), was included in the Cape Floral Region World Heritage Site in 2004, becoming the first botanical garden in the world to be included within a natural world heritage site.

Kirstenbosch receives more than 750 000 visitors annually. The Kirstenbosch National Botanical Garden houses the Kirstenbosch Research Centre (KRC), the Rufford Maurice Laing 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 other gardens in the national network managed by Sanbi 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 in Roodepoort/Mogale City, Hantam outside Niewoudtville and the Pretoria National Botanical Garden.

The Pretoria National Botanical Garden houses the National Herbarium of South Africa, the largest herbarium in the southern hemisphere.

The Harold Porter National Botanical Garden boasts Disa uniflora in its natural habitat (flowering from mid-December to the end of January), and 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 hectares (ha) and consists of landscaped and natural areas. All the garden's plants are indigenous to southern Africa.

The Hantam National Botanical Garden outside Nieuwoudtville in the Northern Cape, covers 6 300 ha of land on the Bokkeveld Plateau, which is famous for its range and density of bulbous plants, to the extent that Nieuwoudtville is often referred to as the "Bulb Capital of the World".

Some 40% of the local flora consist of bulbs that create spectacular displays every autumn and spring. The garden also incorporates large natural patches of renosterveld fynbos and succulent Karoo vegetation. Almost a third of the species endemic to the Bokkeveld Plateau are threatened with extinction.

Sanbi operates environmental-education programmes within its national botanical gardens, and outreach greening programmes focused on

promoting indigenous gardening at disadvantaged schools in surrounding areas.

Biosystematics and Collections

Sanbi researches 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. There are also regional herbaria in Durban (KwaZulu-Natal Herbarium) and at the KRC (Compton Herbarium).

Recent products of plant taxonomic research within Sanbi have included a national plant checklist and the first-ever flowering plant checklist for sub-Saharan Africa. There are 50 136 plant taxa recorded for sub-Saharan Africa and some 19 581 indigenous plant species for South Africa. South Africa, with its 11 700 endemic plant species, has the richest temperate flora in the world.

Applied Biodiversity Research

In addition to herbarium and taxonomic research, Sanbi has an Applied Biodiversity Research division. The division's staff is concentrated in the KRC in Cape Town, which is a centre of excellence for biodiversity research. The intention is to expand the research programme to Pretoria and other centres.

The research programme focuses on the impact of climate change, invasive alien species and land-use on biodiversity; understanding the dynamics of species and ecosystems to determine thresholds of sustainable use; and research on species and ecosystems of special concern (including threatened species and ecosystems).

Scientists in the Applied Biodiversity Research Programme have developed a new vegetation map for South Africa and maintain the Protea Atlas Database, one of the most comprehensive plant databases in the world. The division leads the South African component of a global project on the conservation and sustainable use of pollinators as part of an assessment of biodiversity-related ecosystem services.

The facilities at the KRC include the Leslie Hill Molecular Systematics Laboratory, which hosts an active research programme in molecular ecology and evolution. A DNA bank for plants has been established at the laboratory, in collaboration with the Royal Botanic Gardens, Kew, in the United Kingdom (UK). A bank for reptile DNA was established as part of the South African Reptile Conservation Assessment (SARCA). The objectives of the DNA banks are to archive the DNA of at least one species of all 2 200 genera of South Africa's flowering plants, as well as all South Africa's reptile species; to train South African researchers and students in high-profile biotechnologies; and to produce a tree-of-life analysis of South African taxa.

Climate Change and Bio-Adaptation

This division is based at the KRC but is expanding its staffing in Pretoria. It builds on the successes of the Global Change and Biodiversity Research Group and its predecessors that have conducted research on climate change, and facillitated translation of research results into policy relevance since the early 1990s. The group has a strong theoretical basis, having contributed some 100 peer-reviewed scientific publications over the past five years on a broad array of topics, allowing the assessment of key vulnerabilities of southern African ecosystems to ongoing climate change.

The division's scientists conduct physical experimental research under laboratory and natural conditions and also employ computer-simulation approaches to optimise the use of results obtained. Topics of study range from the physiological impacts of rising carbon dioxide and temperature extremes on plant growth and ecosystem change; projections of the responses of bird, reptile, mammal and plant species to shifts in climate; early detection and monitoring of climate-change impacts on wild populations; to understanding the drivers and impact of wild fires on regional, national and global scales. Together, research findings have provided useful insight into the possible range of strategies available to conservationists and land managers under a changing climate. These findings have specifically begun to guide the identification of vulnerable and resilient regions of the country under a range of climate scenarios, which is essential for optimising sustainable conservation planning efforts.

Division researchers have also contributed to key policy-guiding reports on climate-change vulnerabilities and adaptation strategies for the Western Cape Department of Environment and Development Planning and the national Department of Environmental Affairs and Tourism. Members have served on the Intergovernmental Panel on Climate Change, whose contributing scientists collectively won a Nobel Peace Prize for their work in 2007. Division researchers also support national

negotiators at international forums such as the Convention on Biodiversity and UN Framework Convention on Climate Change.

Millennium Seed Bank

The Millennium Seed Bank Project in South Africa is part of a 10-year 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 in the UK 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 conservation facility.

Greening of the Nation

The Greening of the Nation Project, managed by Sanbi, is a government-funded programme that has been initiated in various provinces 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 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.

Working for Wetlands

Sanbi also manages the Working for Wetlands Programme, with its offices based at the Pretoria National Botanical Garden. In 2007, Working for Wetlands rehabilitated 83 wetlands in all nine provinces and in the process employed 2 265 people and used 250 small businesses, some created specifically for wetland rehabilitation. The programme provided more than 36 000 training days to its beneficiaries.

Funding is provided by the Department of Environmental Affairs and Tourism and the Department of Water Affairs and Forestry through the EPWP. It uses a labour-intensive approach, thus creating jobs, both temporary and permanent, and small businesses.

Biodiversity planning and assessment

Sanbi has assessed the contribution of municipal nature reserves to meeting national biodiversity targets, which has highlighted the crucial role that municipal nature reserves play in conserving biodiversity, and the need for supporting the development of municipal capacity to manage them effectively.

Sanbi has supported the initiation of provincial biodiversity plans in the Eastern Cape and North West. These plans will form the basis for publishing bioregional plans in terms of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004). North West and the Eastern Cape join Gauteng, KwaZulu-Natal and Mpumalanga as provinces that have systematic spatial biodiversity plans that identify priority areas for biodiversity, using the best available science.

Bioregional programmes

Sanbi co-ordinates a suite of bioregional programmes that focus on partnership projects to mainstream biodiversity in socio-economic development.

The most recent addition to the suite is the Marine Biodiversity Programme, initiated in partnership with the World Wide Fund for Nature South Africa (WWF-SA) and Marine and Coastal Management of the Department of Environmental Affairs and Tourism. The programme focuses on facilitating the establishment of a network of offshore marine protected areas (MPAs) in South Africa's waters, and engaging with the fisheries and mining sector.

The Grasslands Programme focuses on mainstreaming biodiversity in production sectors. Demonstration projects underway include rehabilitating river ecosystems in the Free State, wetland mitigation banking with the coal-mining industry

The Cabinet-mandated Long-Term Mitigation Scenario (LTMS) study, which will set the pathway for South Africa's long-term climate policy, will eventually inform a legislative, regulatory and fiscal package that will give effect to the policy at a mandatory level.

The LTMS lays a firm basis for a progressive National Policy on Climate Change. It culminated in the National Climate Summit and Science Conference early in 2009. During this summit, the department launched the policy process that translated the LTMS into fiscal, regulatory and legislative packages as well as sectoral implementation plans. The national summit involved key government departments, industry, labour and non-governmental organisations.

in Mpumalanga, securing priority biodiversity sites within urban areas in Gauteng, biodiversity stewardship on farms in the Wakkerstroom area in Mpumalanga, working with the forestry industry to secure 35 000 ha of high biodiversity priority forestry-owned land and ensuring that expansion of small-grower plantation forestry is underpinned by biodiversity considerations.

The Succulent Karoo Ecosystem Programme (Skep) has established innovative partnerships with De Beers on the Namaqualand coast and with Anglo American Base Metals as part of the Bushmanland Conservation Initiative in the Northern Cape, securing mine-owned land in conservation agreements that contribute to national biodiversity targets.

In partnership with the Development Bank of Southern Africa (DBSA), Conservation International and the Critical Ecosystem Partnership Fund, Skep has established Skeppies, the first-ever small grant fund enabling synergy between conservation and local economic development activities.

The Subtropical Thicket Ecosystem Programme (Step) focuses on integrating maps of biodiversity priorities into municipal planning and land-use decision-making in the Eastern Cape, including publishing a fully revised Step handbook and mapbook.

Step has initiated four biodiversity-related integrated development plan (IDP) projects in municipalities in the Fish River valley.

Cape Action for People and the Environment (Cape) closed off its US$6-million investment from the Critical Ecosystem Partnership Fund, having funded 65 civil-society-led projects in the Cape Floral Region over a five-year investment period. It continues to roll out the Biodiversity Conservation and Sustainable Development Project with an investment of US$11 million from the Global Environment Facility (GEF), with a key focus on strengthening co-operative governance for improved biodiversity management in this global biodiversity hotspot.

Sanbi gave extensive input into the development of the Woolworths Biodiversity Strategy, through the Cape, Skep, Step and Grasslands programmes.

Assessing and monitoring indigenous fauna and flora

Since 2004, Sanbi has responded to its new mandate through the initiation of a suite of projects that will assess and monitor the status of South Africa's indigenous fauna. As part of its Threatened Species Programme, Sanbi co-ordinates several atlas projects, which capture records of species occurrences across the country through the participation of hundreds of volunteer members. Highlights include the following:

- SARCA, launched in May 2005, is a four-year conservation-assessment programme aimed at identifying and conserving reptile species threatened by extinction in South Africa. Funded and developed by Sanbi, the project is driven by experts from South African universities, museums, conservation agencies and the Herpetological Association of Africa. The University of Cape Town's Animal Demography Unit (ADU) is co-ordinating the project, which involves gathering thousands of records of reptile sightings from all over South Africa, Lesotho and Swaziland. Some 20 volunteers joined the field team on outings and 4 540 photographic records from more than 100 amateur photographers have been submitted to the burgeoning online virtual museum (see *www.sarca.adu.org.za*).
- The launch of the *South African National Survey of Arachnida* took place in September 2006. This collaboration between the ARC and Sanbi is progressing well and has garnered much attention and support from the public and conservation and scientific communities.
- The Southern African Butterfly Conservation Assessment (Sabca), was launched in May 2007. Sabca is a four-year conservation project aimed at determining the distribution and conservation priorities of all butterfly species in the southern African region, especially those threatened with extinction. This project was made possible through a partnership between Sanbi, the Lepidopterists' Society of Africa (LepSoc) and the ADU. The project is co-funded by the Norwegian Ministry for the Environment and Sanbi through its Environment Co-operation Programme. Sabca is the first major project on insects to be undertaken by Sanbi. Already over 1 820 photographic records from more than 100 amateur photographers have been submitted to the project's online virtual museum (see *www.sabca.adu.org.za*)
- Sanbi's Custodians of Rare and Endangered Wildflowers (Crew) has been so successful in its aim to involve local communities in monitoring and conserving their rare and threatened plants that it has now established offices in Pretoria and Pietermaritzburg.

- Sanbi's Birds and Environmental Change in South Africa Programme has progressed with its aim of using birds as indicators of ecosystem change and human well-being. In June 2007, the programme launched the four-year Southern African Bird Atlas Project 2 (Sabap2). Sabap2 is a major public-participation project to learn more about how birds respond to changes in their environment – be it climate change, urbanisation, invasive species, wetland drainage, fragmented habitats, pollution, conservation protection or other habitat changes. Sabap2 is a partnership project of the ADU, BirdLife South Africa, and Sanbi, and is carried out across South Africa, Lesotho and Swaziland.

Knowledge and information management

Sanbi's strategic objectives include being the preferred source for biodiversity knowledge and information management in South Africa. Sanbi is actively consolidating its information resources and services, with the aim of supporting research, planning, implementation and monitoring by a range of partners and stakeholders.

Sanbi's Biodiversity Geographical Information System Unit is expanding its services to provide easy access to biodiversity planning and related information for all South Africa's biomes.

Conservation areas

The CBD, to which South Africa is a signatory, requires that 10% of the terrestrial and 20% of marine biodiversity be conserved by 2010. There are a number of management categories of protected areas in South Africa, which conform to the accepted categories of the International Union for Conservation of Nature (IUCN). By May 2008, about 5,9% of South Africa's land surface area was under formal conservation through the system of national and provincial protected areas.

The Department of Environmental Affairs and Tourism has committed significant financial resources towards the expansion of formal protected areas, bringing the number of national parks to 22, and the total formal conservation estate to four million hectares. Since 2004, the department declared four new MPAs, thus increasing the total coastline under protection to 20%.

The NSBA confirmed that the current protected area network does not conserve a true representative sample of South Africa's biodiversity. Because of historical reasons, formal protected areas were often established with limited consideration to biodiversity and the maintenance of ecological processes. A large proportion of biological diversity and critical ecosystem processes are therefore found outside of terrestrial MPAs.

This has led to the development of the National Protected Areas Expansion Strategy. This strategy sets out a framework for the expansion of the protected areas network in South Africa so that a more representative sample of biological diversity may be conserved and managed.

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 Cederberg Wilderness Area and Dassen Island in the Western Cape, and the Baviaanskloof Wilderness Area in the Eastern Cape.

Marine protected areas

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.

In October 2008, Stilbaai MPA became the 20th such protected area.

National parks and equivalent reserves

SANParks manages several national parks throughout South Africa, excluding in Gauteng, North West 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 Environmental Management: Protected Areas Act, 2003, 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.

South Africa's national parks are:

- Addo Elephant National Park
- Agulhas National Park
- Augrabies Falls National Park
- Bontebok National Park
- Blyde River National Park
- Camdeboo National Park
- Golden Gate Highlands National Park
- Groenkloof 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
- Mapungubwe National Park
- Mokala National Park
- Mountain Zebra National Park
- Namaqua National Park
- Ai-Ais/Richtersveld Transfrontier National Park
- TMNP (which incorporates the Cape of Good Hope, Table Mountain and Silvermine nature reserves)
- Tankwa Karoo National Park
- Tsitsikamma National Park
- Wilderness National Park
- West Coast National Park
- Wild Coast National Park.

On 14 August 2008, the TMNP celebrated its 10th birthday. One of the key successes achieved has been the delivery of social benefits through the park's poverty-relief programme, which enabled the TMNP to use over R40 million worth of funds from the Department of Environmental Affairs and Tourism's Social Responsibility Programme to upgrade 250 km of the footpath network, build "Touch the Earth Lightly" tourist accommodation, and provide training opportunities to previously unemployed people.

The programme employed 600 people a year for the past five years and included the training of world-class Hoerikwaggo mountain guides and the development of and support for small, medium and micro-enteprises from within the communities bordering the TMNP.

In May 2008, the Kruger National Park celebrated 110 years of existence by holding several events to mark its status as a world leader in conservation policies and management principles.

On 31 May, the South African Mint officially launched the 2008 set of Krugerrand gold coins.

From 31 August to 2 September 2008, the Department of Environmental Affairs and Tourism held the People and Parks Conference in Mafikeng, North West. The conference looked at the role protected areas play in local economic development and poverty alleviation.

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 as follows:

- Ai-Ais/Richtersveld TFCA

In May 2008, the Department of Environmental Affairs and Tourism and South African National Parks completed the second year of implementation of the Infrastructure Development Programme for which a total amount of R541 million was made available over a four-year period.

By May 2008, the programme had employed 1 357 people. Some 50 small, medium and micro-enterprises were empowered and transformation in the construction industry was actively supported. Under this programme:

- 145 tourism-accommodation units were upgraded and many new accommodation units constructed in various national parks
- 89 upgraded and new staff accommodation units were put in place in various national parks.

Construction work has also started on important initiatives that include the following:

- a new transfrontier park entrance gate at Twee Rivieren in the Kgalagadi Transfrontier Park
- conference centres in Mopani and Skukuza rest camps in the Kruger National Park
- a world-class centre in Mapungubwe National Park that will celebrate the rich heritage of this world heritage site.

- Kgalagadi Transfrontier Park
- Limpopo/Shashe TFCA
- Great Limpopo Transfrontier Park
- Lubombo Transfrontier Conservation and Resource Area
- Maloti-Drakensberg Transfrontier Conservation and Development Area

"Boundless Southern Africa", the consolidated TFCA brand was officially launched by nine southern African countries at the Tourism Indaba in Durban in May 2008.

Angola, Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe unanimously showed their support for the brand as a means of showcasing the TFCAs in the SADC region.

The development of the joint brand is based on the motivation that the 2010 Soccer World Cup tournament will not only benefit South Africa alone but the SADC region and Africa as a whole.

The purpose of the TFCA development strategy for 2010 and beyond is to increase the tourism potential of southern Africa by consolidating the market, infrastructure-development and investment-promotion efforts of existing transfrontier conservation initiatives.

The brand is a reflection of the values of the TFCAs and it will form the basis for awareness-raising campaigns and for the active marketing of TFCAs.

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, including 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 covers 376 900 ha that include a number of threatened vegetation types and important bird-breeding sites
- Waterberg Biosphere Reserve in Limpopo, which covers 1,4 million ha that include the Marakele National Park and the Nylsvlei Ramsar Site
- Kruger-to-Canyons Biosphere Reserve, which covers more than 3,3 million ha that span the boundary between Limpopo and Mpumalanga.

The core areas of the Kruger-to-Canyons Biosphere Reserve 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 September 2008, there were 878 world heritage sites in 145 countries. A total of 174 were natural sites, 679 were cultural sites and 25 were mixed sites.

The South Africa World Heritage Convention Committee is responsible for identifying possible world heritage sites in South Africa and co-ordinating 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

On 22 September 2008, the South African National Parks (SANParks) officially launched the 2008 week-long celebration of access to parks by South Africans, namely the SANParks Week. Access to most parks was free from 22 to 26 September.

This concept was launched in 2006 to encourage all South Africans to visit national parks.

The objective of SANParks Week is to cultivate a culture of pride in all South Africans in their relationship with the country's natural, cultural and historical heritage, under the established theme *"Know Your National Parks"*. The feature element of the project is free access to all South African day visitors during this week (especially people from communities around the parks) carrying an official identity document, while scholars and young persons under 16 years of age are allowed entry without proof of identity.

in a culturally and environmentally responsible way.

South Africa has eight world heritage sites proclaimed by Unesco, namely Robben Island; the iSimangaliso Wetlands Park; 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; the Vredefort Dome; and the Richtersveld Cultural and Botanical Landscape.

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 across.

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 past 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 Provincial 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.

The Richtersveld Cultural and Botanical Landscape was declared a world heritage site in June 2007. It covers an area of 160 000 ha of dramatic mountainous desert in the north-west part of South Africa. It is the only area where the Nama still construct portable rush-covered domed houses, or Iharu oms.

Southern Africa's transfrontier conservation areas (TFCAs) have packaged 53 investment opportunities in the various countries. They range from small and medium lodge type developments to multimillion rand developments such as the Kavango-Zambesi Waterfront Development.

The Department of Environmental Affairs and Tourism hosted an investment conference on behalf of the nine Southern African Development Community (SADC) countries (Angola, Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe) in October 2008. The key objective of the conference was to market a portfolio of uniquely packaged tourism investment opportunities in the seven existing TFCAs to potential investors.

The conference provided a platform for potential investors to meet and network with product owners, government authorities and decision-makers. It was aimed at private and institutional investors, property developers, investment-holding companies, hotel-management groups, commercial and investment banks, conservation agencies and donor organisations focusing on the:

- overview of the current investment climate, specifically pertaining to southern Africa
- investment opportunities in the TFCAs
- tender processes for each of the countries.

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

Through the *National Wetland Inventory*, South Africa has identified 120 000 wetlands, which cover 7% of the country's surface area.

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 Nylsvley 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, the Orange River Mouth Wetland and the Makuleke Wetland.

The IUCN identifies wetlands as the third most important support system on Earth.

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 in 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 SMMEs; and transfer of skills to the beneficiaries of the programme's projects.

The programme contributes directly to the objectives of the EPWP and constitutes a partnership between the departments of environmental affairs and tourism, of water affairs and forestry, and of agriculture. It is managed by Sanbi.

World Wetlands Day marks the date of the signing of the Convention of Wetlands on 2 February 1971 in the Iranian city of Ramsar. The theme for World Wetlands Day 2008 was *Healthy Wetlands, Healthy People*.

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 African Association of Zoological Gardens, the International Union of Zooculturists and the International Association of Zoo Educators.

The NZG of South Africa is a proud facility of the NRF. The NRF is a government agency responsible for supporting and promoting research, and providing research facilities to encourage the creation of knowledge, innovation and development in all fields of science and technology. (See chapter 17:*Science and technology*.) The 85-ha zoo in Pretoria houses 3 117 specimens of 209 mammal species, 1 358 specimens of 202 bird species, 3 871 specimens of 190 fish species, 388 specimens of four invertebrate species, 309 specimens of 93 reptile species, and 44 specimens of seven amphibian species. These figures comprise the animals housed at the zoo in Pretoria as well as at the two biodiversity-conservation centres in Lichtenburg, in the North West, and Mokopane, in Limpopo, and the satellite zoo and animal park at the Emerald Animal World complex in Vanderbijlpark.

The NZG is the largest zoo in the country. More than 600 000 people visit the zoo annually. The total length of its walkways in the zoo in Pretoria is about 6 km.

An aquarium and reptile park also form part of the zoo facility in Pretoria. The aquarium is the largest inland marine aquarium in the country.

The third-largest collection of exotic trees can be found at the zoo.

In 2001, the NZG established the 203-ha Emerald Animal World housed at the Emerald 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, giraffe, various antelope and reptile species, and Cape fur seals. Most of the animals were provided by the national zoo's

Many wetland plants have great medicinal value. In South Africa, traditional medicine is the preferred primary healthcare choice for about 70% of people. Wetlands provide some of the 19 500 tons of medicinal plant material, which are used by 28 million South Africans every year.

biodiversity conservation centres in Lichtenburg and Mokopane.

The Johannesburg Zoological Gardens, or Johannesburg Zoo, 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 more than 2 000 animals from 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 Biodiversity Conservation Centre, which covers an area of some 6 000 ha, and the Makopane Biodiversity Conservation Centre, covering an area of 1 333 ha.

The two centres supplement the zoo's breeding programme for various endangered animals, and the zoo's own animal collection.

The Lichtenburg Biodiversity Conservation 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 serve as a natural haven for waterbirds such as spoonbills, kingfishers, ibises and herons.

The Mokopane Biodiversity Conservation Centre is home to an abundance of exotic and indigenous fauna such as lemur, the rare tsessebe, roan antelope and black rhino.

The world's oldest map of Africa was commemorated in Cape Town on 25 August 2008. The Montalboddo Fracan map of Africa is 500 years old. It was first published in Milan in 1508 and is the first known map of Africa printed as a separate continent. It was first printed in a book compiled by Italian monk Fracanzano Montalboddo. While modern-day maps are much more accurate and contain more information, it is through the Montalboddo Fracan map that Africa as a continent was first recognised and given an identity.

The 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 breeding and releasing 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 white-backed, hooded, whiteheaded and lappet-faced vultures. The centre is also known for its wild-dog-breeding programme.

The Hoedspruit Research and Breeding Programme also includes the rare black-footed cat, 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 NZG 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 and two larger tanks that display sharks and stingrays. East London has a smaller aquarium.

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 along 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 in 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 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.

The Integrated Coastal Management Bill will replace the Seashore Act, 1935 (Act 21 of 1935). The Bill also replaces the Dumping at Sea Control Act, 1980 (Act 73 of 1980), and introduces, for the first time, a comprehensive national system for planning and managing South Africa's spectacular and valuable coastal areas.

The purpose of the National Coastal Management Bill is to:

- provide a legal and administrative framework that will promote co-operative, co-ordinated and integrated coastal development
- preserve, protect and enhance the status of the coastal environment as the heritage that belongs to all
- ensure coastal resources are managed in the interest of the whole community
- ensure there is equitable access to the opportunities and benefits derived from the coast
- give effect to certain of South Africa's international legal obligations.

This Bill declares the seashore, coastal waters (including estuaries) and South Africa's territorial seas to be coastal public property. It therefore also requires the State to act as the trustee of coastal public property.

New fisheries

The Department of Environmental Affairs and Tourism has completed the allocation of long-term commercial fishing rights of eight to 15 years in 20 fishing sectors. Out of more than 8 000 applicants for fishing rights, 2 480 were granted long-term fishing rights, with 59% of these being Black Economic Empowerment-compliant. By mid-2008, a performance review process of the commercial fishery rights allocation was underway and draft policies on the transfer of commercial fishing rights and allocation of large pelagics had been published. To complete the allocation process, the department is working on a revised Policy on Subsistence/Small-Scale Fisheries.

Aquaculture

Marine aquaculture is an integral part of the department's strategy to diversify the fishing industry. In 2007, the department published the first-ever marine aquaculture policy for South Africa. The policy aims to create an enabling environment that includes transforming and broadening participation in the industry through small, medium and micro-enterprise (SMME) initiatives and facilitating finance and skills development.

The policies are also intended to improve the management and control of environmental impacts and increase the resource base to include a more diverse suite of species.

Poaching and environmental changes have led to declines in the natural abalone population. This has led to the closure of the wild abalone commercial fishery. The Department of Environmental Affairs and Tourism has identified that abalone ranching can play an important role in enhancing depleted abalone stocks. Furthermore, jobs could be created within the communities adjacent to areas identified to be suitable for ranching.

Over the past couple of years, abalone farming has developed rapidly and production levels are now in the order of about 1 000 tons. With the increase in the availability of abalone spat, various ranching experiments have been initiated, mainly near Port Nolloth along the West Coast and, on a smaller scale, at Cape Recife along the East Coast.

Areas for abalone ranching have been identified from Port Nolloth in the Northern Cape to Hamburg in the Eastern Cape. The department has therefore developed guidelines on abalone ranching and stock enhancement.

In February 2008, regulations concerning diving restrictions were gazetted. These regulations form part of a suite of actions aimed at protecting wild abalone resources.

These regulations indicated the department's intention to ban diving in five areas of the coastline, comprising three islands (Robben Island, Dyer Island and Bird Island) and two coastal areas, from Gansbaai to Quoin Point and at Cape Point. The proposal for a diving ban is an essential component of the strategy to protect abalone in certain key areas where the stock is most likely to recover. The proposed areas were also assessed in terms of their importance to recreational users, in particular scuba divers and scuba-diving businesses, spear fishers and recreational West Coast rock lobster fishers.

Furthermore, any person who wishes to undertake any of the following activities can apply for a permit to engage in diving or be in possession of prohibited gear in the listed areas:

- scientific research and monitoring
- white shark-cage diving
- commercial kelp harvesting
- sea ranching
- salvage operations
- maintenance of legal underwater infrastructure
- any other activity authorised in terms of legislation.

The gazetting of the regulations coincided with the implementation of the emergency suspension of the abalone fishery on 1 February 2008.

4x4 regulations

Following the successful implementation of the 4x4 regulations that provide for the controlled use of off-road vehicles in coastal zones, the monitoring of certain stretches of coast has indicated that the banning of off-road vehicles has enabled several shore-breeding birds, especially Damara tern and the African black oystercatcher, to breed successfully on beaches once more.

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.

The Department of Environmental Affairs and Tourism approved the final policies for boat-based whale watching (BBWW) and white shark-cage diving (WSCD), which were gazetted in June 2008. The gazetting will also serve as a call for applications for the allocation of permits during 2008. These are fast-growing industries that have the potential to generate considerable socio-economic benefits for coastal communities and operators, while providing educational benefits for the participants.

There are nine authorised BBWW operators and 12 authorised WSCD operators who are each restricted to operating one vessel. The department intends to increase this in the new rights-allocation process. Permits will be allocated from Port Nolloth to Sodwana Bay in the BBWW sector while the attraction of white sharks for the purposes of cage diving and surface viewing will be limited to Seal and Dyer Island, Quoin Point, Seal Island in Mossel Bay and Algoa Bay in the Port Elizabeth area. The overall goal of these policies is to provide a proper regulatory framework, to grow these industries and to advance transformation and Black Economic Empowerment.

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 (2000)*. 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.

The Blue Flag beaches for 2008/09 were:

In the Eastern Cape:

- Dolphin Beach, Jeffrey's Bay
- Humewood Beach, Port Elizabeth
- Hobie Beach, Port Elizabeth
- Kelly's Beach, Port Alfred
- King's Beach, Port Elizabeth
- Wells Estate, north of Port Elizabeth

In KwaZulu-Natal:

- Hibberdene Beach, south coast
- Margate Beach, south coast
- Marina / San Lameer Beach, south coast
- Ramsgate Main Beach, south coast

In the Western Cape:

- Bikini Beach, Gordon's Bay
- Camps Bay Beach, Cape Town
- Clifton Fourth Beach, Cape Town
- Grotto Beach, Hermanus
- Hawston Beach, near Hermanus
- Lappiesbaai Beach, Stilbaai
- Mnandi Beach, Cape Town
- Muizenberg Beach, Cape Town
- Strandfontein Beach, Cape Town

According to the Department of Environmental Affairs and Tourism, a further 16 South African beaches are piloting the Blue Flag programme with the aim of achieving full accreditation in 2009 or 2010.

Contracting parties to the Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region, the Abidjan Convention, met in South Africa on 10 June 2008 to strengthen strategies in response to increasing challenges marine and coastal environments are faced with.

The Abidjan Convention area covers some of the most productive coastal and marine ecosystems in the world, rich in oil, gas and mineral resources and with a great potential for tourism. The coastal zones of the convention area are hubs for intense socio-economic activities, centres of human settlements, transport and industrial and commercial activities. New threats have emerged, in particular invasive alien species and climate change and with it ocean acidification.

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 Danish-funded 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 made towards improving environmental quality in South Africa. Five key municipalities have been chosen as pilots for this programme, namely Cape Town, Durban, Ekurhuleni,

South African waters are of global importance for conserving seabirds. With a total of over 28 albatross and petrel species recorded caught by South African fisheries, the South African seas are an important feeding ground for many albatrosses and petrels. Thirteen of these recorded species are currently threatened with extinction, resulting from several factors, such as the deterioration of breeding habitats targeted hunting and fishing operations.

South Africa's sub-Antarctic Prince Edward islands hold 44% of the world population of wandering albatrosses and 21% of the global population of Indian yellow-nosed albatrosses. Surveys show that the numbers of African penguins breeding in the Western Cape have decreased by about 70% in the past four years, and the overall population of the species is presently at its lowest recorded level.

It is within this context that South Africa launched the National Plan of Action for reducing the incidental catch of seabirds in longline fisheries (NPoA seabirds) at the official opening of the international meeting of the Agreement on the Conservation of Albatrosses and Petrels. Launching the NPoA seabirds demonstrates South Africa's continued commitment to conservation and management of seabirds in a sustainable and responsible manner.

Johannesburg and Sedibeng (Vaal Triangle). The three provincial partners are Gauteng, Western Cape and KwaZulu-Natal.

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 IDPs. The professional development of environmental health officers will also receive special attention.

Climate and atmospheric change

The South African Government launched its Long-Term Mitigation Scenario (LTMS) process on climate change in 2006. Findings and policy recommendations based on the LTMS were presented by stakeholders from government, business, civil society and labour, to the Cabinet at its Lekgotla held in July 2008.

Government's vision and the implementation of this policy framework will be the insurance policy current and future generations will have against the potentially devastating impacts of climate change. By adopting this strategic direction, South Africa takes a leading position in the developing world and demonstrates it is ready to shoulder its fair share of responsibility as part of an effective global response.

The international negotiations on strengthening the climate regime after 2012 gained significant momentum at the talks in Bali in December 2007.

This process will conclude in Copenhagen at the end of 2009. South Africa's LTMS process also establishes parameters for its post-2012 negotiating positions.

Government has outlined its vision for climate policy in the following terms:

- in designing the policy for the transition to a climate-resilient and low-carbon economy and society, the mitigation and adaptation response will be balanced
- the climate response policy, built on six pillars, will be informed by what is required by science, namely to limit global temperature increase to 2°C above pre-industrial levels.

The six policy-direction themes are:

- greenhouse gas emission (GHG) reductions and limits
- building on, strengthening and/or scaling up current initiatives
- implementing the Government's "Business Unusual" Call for Action in 2008
- preparing for the future
- vulnerability and adaptation
- alignment, co-ordination and co-operation.

Milestones will include a national summit in February 2009, the conclusion of international negotiations at the end of 2009 and a final domestic policy to be adopted by the end of 2010 after international negotiations have been completed.

The process will culminate in the introduction of a legislative, regulatory and fiscal package to

South Africa's national environment campaign, Indalo Yethu, was lauched in 2007. Meaning "Our Environment, Our Place and Our Future", Indalo Yethu is a legacy project of the World Summit on Sustainable Development, which was held in South Africa in 2002.

give effect to the strategic direction and policy from now up to 2012.

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, to among other things, foster scientific and technological co-operation.

The country has introduced legislation such as the Biodiversity Act, 2004 to promote the conservation of biodiversity, and fight desertification and land degradation.

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 2008, the National Environment Management: Waste Bill was put before Parliament.

Government aims to reduce the amount of "big five" wastes – plastics, cans, paper, glass and tyres – that reach landfills by 70% by 2022 and to minimisie and treat 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 a Memorandum of Understanding (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 were allowed to continue using their existing machinery to make bags of 24-micron thickness for the following 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 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.

The National Radioactive Waste Management Agency Bill was approved by Cabinet in April 2008.

During the processing of the Bill, it was agreed between the department and the Parliamentary Portfolio Committee that the title of the National Radioactive Waste Management Agency be changed to the National Radioactive Waste Disposal Institute (NRWDI).

The objects of the Bill are to:

- provide for the establishment of the NRWDI
- manage radioactive waste disposal nationally
- manage its functions effectively
- regulate staff matters
- manage all relevant functions.

The establishment of the institute will allow the operators/generators to focus on their core business. However, the generators will remain financially responsible for the disposal of the waste.

This institute will be solely responsible for handling radioactive waste disposal, predisposal management and storage at the disposal site.

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, developing, implementing and administering water-quality management policy; authorising 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. 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 22: *Water affairs and forestry*.)

Air pollution

The National Environment Management: Air Quality Act, 2004 (Act 39 of 2004), was promulgated in 2005. The Act, which repealed the Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965), gives effect to an integrated pollution and waste-management policy to ensure that all South Africans have access to clean air.

In 2007, as part of implementing the Air Quality Act, 2004, registration certificates issued in terms of the Atmospheric Pollution Prevention Act, 1965 were reviewed.

To this effect, it has prioritised the key sectors whose permits require review. These include the petrochemical sector (seven operations); primary steel manufacture (nine operations); primary aluminium production (two operations); ferro-alloy industries, specifically chromium, vanadium and manganese (ferro-silicon) production (27 to 30 operations); pulp and paper industries (nine operations); and coal-fired power stations (national grid) (20 operations).

The Department of Environmental Affairs and Tourism has made significant strides in addressing air-pollution problems. In addition to the Durban Multipoint Plan for Air-Quality Management, it has declared the Vaal Triangle air-shed as a priority area requiring urgent intervention by government and all stakeholders. It has established an air-quality monitoring system in the area, and six air-quality monitoring stations have been procured and installed to generate data. Air-quality monitoring stations were also launched in the Highveld Priority Area in August 2008.

Marine pollution 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 of Environmental Affairs and Tourism 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 disposing, recovering or stabilising the spilt oil and rehabilitating the environment.

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.

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

From a total of 50 commercially exploitable line fish species in South Africa, 19 have collapsed. South Africa has over 200 species with a substantial number of species endemic, which places even greater responsibility to ensure the sustainability and survival of the species.

Scientists estimate that globally, 75% of global fish stocks are either exploited at maximum levels or are overexploited. It takes up to 10 years for a single fish to mature reproductively.

Protecting South Africa's seas

To counter illegal activities along the 3 000-km coastline, as well as the country's 1 155 000-km^2 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 FCO Policy. The department has 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. The vessels also conduct multilateral patrols in the SADC coastal states.

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 have signed an MoU that will allow them to share information about the movement of licensed boats along the southern African coast.

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 JPoI, the department has begun to explore implementation of the EAFM.

The purpose of the 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 the negative effects of fisheries on the ecosystem.

Transboundary research collaborations

The Department of Environmental Affairs and Tourism 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 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 Nepad initiatives, and are supported by SADC as regional projects.

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

The WIO-LaB Project deals with the protection, prevention and management of marine pollution from land-based activities.

Commitment was given to this project by the main donors, the United Nations Environmental Programme (UNEP) and the GEF. The Department of Environmental Affairs and Tourism 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, aimed at 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.

South Africa has joined several countries across the world in promoting the "eco-village" idea, which focuses on low-impact and sustainable living.

The idea is the vision of One Planet Living – a joint venture between the World Wide Fund for Nature and the British environmental organisation BioRegional.

South Africa's first eco-village will be situated in Sibaya, north of Durban in KwaZulu-Natal. The village will be built on a 885-ha site owned by one of the largest developers in South Africa, Tongaat Hulett Developments. Five thousand homes will be built on this land.

The eco-village concept is based on 10 guiding principles of sustainability, which include eradicating carbon-dioxide emissions; energy efficiency; recycling; sustainable transport systems, which cut dependency on fossil fuels; making use of locally sourced materials and food to boost local economies; adhering to fair trade relationships; promoting biodiversity and preserving local cultural heritage; and endorsing physical, mental and spiritual well-being.

Research observer scheme

The Department of Environmental Affairs and Tourism 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, the influence these fisheries have on the ecosystem.

Chemicals

Although relatively small by international standards, the chemical industry is a significant player in the South African economy.

Several steps have been taken to align current legislation with the Constitution of the Republic of

South Africa, 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 department 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

The Department of Trade and Industry held a recycling study consultative workshop in Midrand in September 2008. The purpose of the workshop was to:

- better understand business-related challenges
- provide guidance about the current and potential size of the industry
- design SMME incentives
- create employment opportunities.

The project was in line with the department's responsibility of meeting the Accelerated and Shared Growth Initiative for South Africa (AsgiSA) objective to halve poverty and unemployment by 2014 through recycling.

The Deputy Minister of Environmental Affairs and Tourism, Rejoice Mabudafhasi launched the Cleaner Fires Campaign, "Basa Njengo Magogo" in Sebokeng in July 2008. Communities using coal as a primary energy source who live near national priority areas that emit hazardous gases, particularly the Vaal Triangle Air-Shed Priority Area, will acquire the new cleaner fire-making methodology called Basa Njengo Magogo, which will drastically reduce coal-induced monozide. This is a joint multistakeholder campaign featuring participants such as the Department of Minerals and Energy, the Department of Health, Sasol, Eskom, Anglo Coal, City of Johannesburg, Ekurhuleni Municipality, Sedibeng District Municipality and the Central Energy Fund.

Since Collect-a-Can was established in 1993, the recycling company has supported Earth Day, with more than 750 000 tons of used beverage cans being recovered and recycled. Collect-a-Can is a joint venture between ArcelorMittal South Africa, which is Africa's major steel producer and producer of tinplate for food and beverage cans and Africa's largest packaging company and beverage can producer, Nampak.

Collect-a-Can annually embarks on various projects which run throughout the year. The biggest project is the schools' competition, a project which aims to encourage, educate and inform children on the importance of a clean environment and how such an environment can be achieved through recycling waste like used beverage cans. The company works within the community to support recycling initiatives and has a strong commitment to socio-economic empowerment.

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. The South African Government has undertaken the following to address the asbestos issue:

- 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.

The Regulations for the Prohibition of the Use, Manufacturing, Import and Export of Asbestos and Asbestos Containing Materials, which form part of the Environment Conservation Act, 1989 (Act 73 of 1989), were promulgated on 28 March 2008. A grace period of 120 days was allowed for any person or merchant dealing in asbestos or asbestos-containing material to clear their stocks.

The objectives of the new regulations are to prohibit the use, processing and manufacturing, of any asbestos or asbestos-containing product unless it can be proven that no suitable alternative exists. The regulations do, however, provide for asbestos to be used for research purposes. Exposure to asbestos in the workplace, including

mining, industrial, commercial, retail and public workplaces, as well as the maintenance of building material, is still controlled by the Asbestos Regulations of 2001 published by the Department of Labour. These require employers to draw up a register of all asbestos-containing material, conduct a risk assessment, educate and inform employees, protect employees from exposure to asbestos and conduct regular dust and health surveillance.

International co-operation

The Department of Environmental Affairs and Tourism 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).

United Nations Framework Convention on Climate Change (UNFCC)

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 of climate change 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 became a signatory to the Montreal Protocol in 1990 and 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 (ODS), 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 ODS 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)
- ODS 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 the 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 ODS 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 have reduced 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
- WWF-SA.

Acknowledgements

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