



# urban environ **biodiversity**

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*A Drakensburg Dwarf Protea (Protea dracomontana). The protea is the national flower of South Africa, and the flagship species of the Cape Floral Kingdom with 92% of all protea species only occurring in this region.*

ISTOCK





The Ekurhuleni Regional Park, was revamped and upgraded as a 'Welcome Centre' for World Cup visitors. The mosaic tiling map directed visitors to the facilities in the park.

THE OBJECTIVE FOR BIODIVERSITY IN THE NATIONAL GREENING FRAMEWORK AND GREEN GOAL WERE BROADLY FOCUSED, RECOGNISING THE FACT THAT THERE ARE CLOSE LINKAGES BETWEEN BIODIVERSITY, LANDSCAPE, CULTURE AND SUSTAINABLE TOURISM

## 8.1 Introduction

IF ANY TOURIST IN SOUTH AFRICA – whether foreign or local – were asked what is the country's primary attraction, they would almost invariably refer to wildlife and natural landscapes. South Africa is blessed with a tremendous diversity of landscape and ecosystems, from the fynbos plant kingdom of the Cape to the "Big 5" game of the Kruger National Park. In fact, South Africa is regarded as one of only five "mega-diverse" countries in the world. It was therefore particularly fitting that the 2010 FIFA World Cup™ would be taking place in South Africa in the year 2010, named by UNEP as the International Year of Biodiversity.

The World Cup itself took place in the country's urban centres (i.e. in the stadiums). Consequently biodiversity was a consideration that came second to others such as energy and water – issues that could be directly addressed through processes like stadium design. In short, opportunities afforded to Host Cities around biodiversity were generally limited. While efforts to increase the profile of biodiversity were given priority in the National Greening programme, the response of Host Cities was, generally, to:

- Focus more broadly on creating, expanding and enhancing green spaces for the public (i.e. urban landscaping and public parks)
- Help the public to connect better with nature (through education projects, and by providing the green public spaces with a focus on indigenous flora for landscaping)
- Enhance cultural heritage (by encouraging the use of these public spaces for arts and cultural activities).

That said, there were some 2010 legacy biodiversity initiatives that deserve to be highlighted. The objectives for biodiversity in the National Greening Framework and Green Goal were broadly focused, recognising the fact that there are close linkages between biodiversity, landscape, culture and sustainable tourism. The South African National Biodiversity Institute (SANBI) was commissioned to manage DEA's public works programme for the National Greening programme (DEA, 2008a), while numerous biodiversity initiatives took place under the scope of other Green Goal initiatives, for example indigenous tree-planting and reforestation for carbon offsetting, and

restoration of wetlands to enhance natural water resources. The actions taken within the various cities around biodiversity and the greening of the urban environment are discussed in the following sections.

## 8.2 Actions taken

**A**CTIONS TAKEN AROUND BIODIVERSITY for the 2010 FIFA World Cup™ generally focused on four sub-themes:

- Restoration of wetlands
- Reforestation, with a focus on indigenous tree species
- Greening of the urban landscape and expanded/enhanced public spaces
- Education of the public on biodiversity and promotion of nature-related tourism.

Wetlands are nature's way of providing clean water to downstream aquatic and marine ecosystems, by filtering out particulates and biologically degrading various pollutants. They are also home to tremendous biodiversity and are often compared to rainforests in terms of their ecological biodiversity and value. Despite this, wetlands are frequently degraded and damaged through inappropriate urban development. Their maintenance and enhancement is a critical element in maintaining biodiversity nationally.

Reforestation through the appropriate planting of indigenous trees enhances water catchment management, supports and enhances natural ecosystems (providing habitats for insects, birds and other small animals), removes carbon dioxide from the atmosphere and stores it in the soil (if managed correctly), helping to reduce the impacts of climate change and minimising soil erosion. By restoring natural habitats to their original state, ecosystems are strengthened and enhanced by providing for a larger and less fragmented habitat.

The greening of urban landscapes and public spaces generally provide only marginal benefits to biodiversity. However there are several 2010 legacy projects that break this mould and achieve more significant biodiversity outcomes.

### 8.2.1 Urban landscaping and city greening

Even where urban landscaping and tree planting are not performed specifically with the objective of maximising biodiversity, the greening of cities generally helps improve the quality of life of their inhabitants and provides numerous health and economic benefits. It could also be argued that it helps city-dwellers feel more connected to nature and fosters an appreciation for biodiversity. Due to the sharp contrasts in urban landscape quality – a legacy of Apartheid-era spatial urban planning – certain areas have been conspicuously neglected in terms of green spaces. Countrywide, municipal and metropolitan governments recognised that the 2010 FIFA World Cup™ offered an opportunity to focus on upgrading the quality of public spaces and improve urban design aspects of city-scapes.

Host Cities undertook significant city greening and beautification initiatives aimed at improving the urban environment of their city centres. In many cases these initiatives were rolled out in townships characterised by a degraded environment. There can be little doubt that the greening of these areas will support education efforts aimed at increasing awareness of and appreciation for South Africa's biodiversity. The use of indigenous plant and tree species was often prioritised within these urban greening programmes.

A prime example is Ekurhuleni Metropolitan Municipality where, despite operating under extreme time pressure, the Parks department managed to roll out a massive city greening programme that included specifications to maximise the use of indigenous plant species, resulting in thousands of indigenous trees being planted.

The City of Johannesburg is another municipality that made commendable strides, particularly through urban greening projects across several of the old Apartheid townships, including Diepsloot Park, Rose Park, Ivory Park, Thokoza Park, Orlando West Regional Park, Diepkloof X-treme Park, Orange Farm Regional Park, Krematart Park,



#### BLOWING THE 'VUVUZELA' FOR BIODIVERSITY

The South African National Botanical Institute (SANBI) has recently named a new plant species commemorating South Africa's hosting the 2010 FIFA World Cup™. The *Moraea vuvuzela* is a species of iris found near Worcester, in the heart of the Cape Floral Kingdom. The pretty little bulb is severely threatened by agricultural development – it is believed that the species has already been wiped out from certain areas through the flooding of the Theewaterskloof Dam, and is currently known to exist in just two localities between Rawsonville and Viliersdorp. The naming of the flower is linked to a conservation programme initiated by the non-profit association Patrons for Biodiversity (BIOPAT), sponsored by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ, the German Technical Development Cooperation Agency), which supported the South African Government in the preparations for the 2010 FIFA World Cup™ on behalf of the German Government.

The epithet "vuvuzela" derives from the raucous air horn, approximately one metre in length, commonly blown by fans at soccer matches in South Africa. The horn became a World Cup icon, and bears a resemblance to the flower with its flared petals.

Source: SANBI website



## GREENING SOWETO: THE 200,000 TREES PROJECT

In April 2010 Johannesburg Mayor Amos Masondo planted the 200,000<sup>th</sup> tree in a celebration of the successful achievement of the 200,000 trees project. The massive greening programme kicked off in 2006 with the aim of correcting environmental imbalances and creating green spaces in southern Johannesburg. The 2010 FIFA World Cup™ provided a critical target for the completion of this programme, another example of how the event motivated agencies and administrations to complete their various legacy projects before the first kick-off.



and Soweto – which saw significant tree-planting and garden creation in previously ‘dead’ open spaces.

Some municipalities went beyond urban greening to actively enhancing the biodiversity value of their urban greening programmes. eThekweni made significant efforts to incorporate principles of biodiversity into several of their keystone urban greening projects, including landscaping around the Moses Mabhida Stadium, which combined indigenous dune, grassland and coastal forest sections within the surrounding park. eThekweni also developed an excellent series of environmental management guides that are available on its website, including a Guide to Green Landscaping (see Communications and Awareness chapter) and an open forum on the greening of buildings and landscapes was held to build local capacity in related disciplines.

## 8.2.2 Protecting, restoring and creating marine and aquatic ecosystems

Several biodiversity legacy projects were undertaken which focused on rivers, wetlands and estuaries. In some cases, these projects were required as part of the environmental impact assessment authorisation process related to a specific 2010 development; in other cases the initiatives were voluntary and associated with an aquatic or marine environment located close to a public viewing area or stadium precinct. Some examples include:

### ETHEKWINI

**Restoration of the Umgeni River Estuary.** The City of eThekweni undertook significant work in this area, including the restoration of the coastal section connecting the main beachfront to the estuary. The foredune zone of the estuary was cleared of alien or inappropriate vegetation and rehabilitated using indigenous species, while ecologically sensitive areas were demarcated to minimise damage from pedestrians. Fifteen hectares of land was cleared.

**The Princess Magogo Stadium, KwaMashu.** The stadium site is located adjacent to a riparian zone (considered to provide wetland functions and services). The environmental authorisation process recognised the importance of these wetland functions and therefore included provisions to minimise damage to the zone. The resulting wetland rehabilitation plan includes “hard” engineering (gabion structures) and other features to minimise erosion and sediment loading into the wetland, as well as “soft” engineering measures such as the clearing of invasive plant species and revegetation with wetland plants endemic to KwaZulu-Natal.

### TSHWANE

**Alien vegetation eradication and river rehabilitation.** The City’s biodiversity action plan placed focus on the removal of alien vegetation and river rehabilitation. Electing to continue its ongoing urban environmental upgrade by selecting river courses for attention, these projects benefited terrestrial and aquatic ecosystems while simultaneously improving freshwater production and quality. A total area of 284 hectares of alien vegetation was cleared throughout Tshwane, mostly along riverbanks. In commemoration of International Biodiversity Day, Tshwane also organised a waste clean-up campaign along the banks of the Hennops River in Centurion adjacent to the 2010 FIFA Soccer World Cup™ fan park site.

### MBOMBELA

**Rehabilitation of Bergvlam Stream.** One of the first projects selected within Host City Nelspruit to respond to the environmental protection clause in FIFA’s Standard Host City Agreement was the rehabilitation of the Bergvlam Stream. The school grounds were selected for use as a fan park due to its accessibility for tourists. Several clean-up campaigns were held along the stream and work is ongoing to restore and preserve this locally important ecosystem. The project included participation by South Africa’s Spar and Miss Earth first princess.

**Restoration of the large Matsafeni wetland upstream of Mbombela Stadium.** Restoration of the Matsefeni wetland was a condition of the water use license issued



### REHABILITATION OF MBOMBELA'S BERGVLAM STREAM

The Bergvlam Stream is a tributary of the Crocodile River, one of SA's biggest rivers, that flows into the world-renowned Kruger National Park. The importance of maintaining healthy river systems, in terms of South African biodiversity, cannot be overstated particularly considering the water-scarce conditions typical of much of the country and the already degraded state of many of its urban river systems.

The drive to rehabilitate the Bergvlam Stream started in 1996 when the Bergvlam Nature Society applied to have the area declared a bird sanctuary. The location of a 2010 public viewing area on the banks of the stream, combined with a renewed focus on water conservation and biodiversity in the National Greening Framework, provided a clear opportunity to identify additional resources for this initiative.

The stream was found to be in poor condition with erosion gullies, alien invasive plants and illegal waste dumping sites. To date, the restoration and rehabilitation of a 5 km (35 ha) portion of the stream has been planned at an estimated cost of over R6 million. The plan commenced in October 2009 with a focus on the removal of alien vegetation (led by Working on Fire) and waste and a re-vegetation programme using trees

and wetland plant species. The waste clearing programme involved numerous local schools. An environmental authorisation process has been initiated for two further planned activities, namely the rehabilitation of the stream with gabions and the stabilising of the river banks. The building of the raised walkways, hiking trails and bird hides are also due to commence following receipt of approval. Local bird guides are presently bringing tourists to this area for bird watching, and these facilities will enhance the tourists' experience of the river.

Following the 2010 FIFA World Cup™, progress is relatively slow due to financial obstacles. However, small steps critical to the programme have been undertaken, including: a bird survey, water quality testing, 1:100 year flood line determination, the collection of 300 trees, in the stream over the next 3 years commencing on Arbour Day 2010, and training of school children on topics such as "What is a Wetland" and on how to identify birds, and the compilation of training manuals. A cornerstone of the project has been the involvement of local schools, local industry, various NGO's (Working for Wetlands, Working for Water, Working on Fire etc.) and the general public.

for the stadium by the Department of Water Affairs. The project is estimated to take three years to complete at a cost of R1,2 million.

#### CAPETOWN

**Creation of new wetlands and Biodiversity Park.** The fynbos garden situated in the Green Point common, near the stadium, can be considered the seminal biodiversity legacy in Cape Town. Although funds were insufficient to construct the garden before the 2010 FIFA World Cup™, financial backing has since been secured and the garden is in progress. It is set to become a tourist attraction in its own right. The availability of non-potable water from the Oranjezicht Springs (see Water Chapter) is enabling the City to develop a series of wetlands-type landscapes. This area will be used to capture and manage water flows with the use of reed-based technologies and vegetation which will also provide habitats for small frogs, insects and birds. The biodiversity garden will include an ECO Centre, facing the wetlands, aimed at educating the public about sustainability in general (Communications and Awareness chapter).

#### OTHER

Various other projects were undertaken in several other Host Cities, including a R10 million project focusing on the restoration of a 3.5 km reach of local stream (including the removal of alien vegetation) in Polokwane and the restoration of a wetland around Royal Bafokeng Stadium in Rustenburg.

### 8.2.2 Reforestation

As part their carbon offset programme, the eThekweni Municipality embarked on a number of reforestation projects. While reforestation and tree planting are not always beneficial for biodiversity, the City's programme ensured a strong biodiversity focus in addition to social and carbon offset goals. Instead of a straightforward greening approach, the reforestation programme allowed for linkages and benefits associated



## FOOTBALL – SCORING FOR BIODIVERSITY IN AFRICA

In addition to offsetting the carbon emission of seven world cup teams, and in recognition of 2010 being the International Year of Biodiversity, PUMA joined up with UNEP and 12 African football teams to promote awareness-raising about habitat and species conservation among football fans and the general public during worldwide football events, including the Orange Cup of African Nations in Angola and the international friendly games leading up to the 2010 FIFA World Cup™ in South Africa.

Awareness and funds were generated by the teams wearing their “Africa Unity Kits” during the summer games to promote awareness of biodiversity. Copies of the Unity Kit were sold along with Unity-Tees and PUMA “Lacelets” to raise money for conservation programs in Africa. The initiative received the support of several African football stars including Cameroon captain Samuel Eto’o, Didier Drogba and Djimon Hounsou. The campaign’s website explains the reason for ramping up the focus on Africa:

*“[the] continent hosts exceptional biodiversity including two of the five most important wilderness areas on Earth – the Congo Basin, and Miombo-Mopane Woodlands and Savannas of Southern Africa. Nine of the planet’s 35 Biodiversity hotspots, the richest and most threatened reservoirs of plant and animal life on Earth, are also in Africa.”*

Three causes (decided by an internet vote) to receive support from the programme are: elephants in Ivory Coast and Liberia, community conservation for gorillas, and an endangered lions programme.

Source: planetgreen.discovery.com and PUMA website

with biodiversity conservation, habitat creation, catchment protection, and direct rural social-economic upliftment.

The first project, undertaken in partnership with the Wildlife Conservation Trust, involved the planting of 104,000 indigenous trees planted on 100 hectares for the recreation of an indigenous forest habitat on the site of the municipal-owned buffer strip (originally planted with sugarcane) around the new regional landfill north of Durban.

The second project has been rolled out at Inanda Mountain on Tribal Authority Land, on forest habitat that has been significantly degraded by the presence of alien vegetation. Figures for Phase I of the project have not yet been released at the time of writing; however the second phase will involve revegetation with 100,000 indigenous trees to restore the natural habitat.



### 8.2.3 Promoting biodiversity-related tourism and education of the public

The UNEP initiative to have 2010 named as the International Year of Biodiversity was intended to help raise awareness of biodiversity and conservation issues worldwide. In keeping with these objectives, some of the programmes detailed above deserve further recognition for their efforts in promoting local biodiversity-related tourism and public education.

The Umgeni River Estuary Precinct has been envisioned as an environmental investment area, to be developed into a space allowing for a combination of biodiversity conservation and human recreation. As part of this scheme a “Green Hub” has been proposed as a central portal through which Durban’s natural assets can be marketed and promoted to profile the City’s outdoor offerings and nature-based tourism (nature-based activities such as trails, canoeing, bird watching etc.). It will also act as an educational centre promoting sustainable living practises and showcasing green technologies and approaches that can be adopted by individuals, businesses and schools. The intention was to pilot the Green Hub during the World Cup, but construction was only completed after the event. The Hub includes numerous sustainable building features including:

- Natural ventilation design
- Photo-voltaic panels to service the building’s full electricity requirements
- No heated water (with the option to buy a solar heater in the medium/long term should the need arise depending on operator)
- Use of low-energy LED lighting
- Low embodied carbon materials used – roof trusses and windows made of timber (as opposed to steel/aluminium)
- Rainwater harvesting (jo-jo tanks) to flush toilets.





The facility is now complete and is awaiting a private-sector partner prior to commencing with its educational and tourist-related promotional activities.

The planned Biodiversity Park and ECO Centre, at Cape Town's Green Point common, is set to soon become a reality. While the Biodiversity Park is intended to serve as a tourist draw-card, the ECO Centre itself will focus on educating the public (locals and visitors) about biodiversity and sustainability. The ECO Centre remains at the advanced planning stages at present. Stadium architects responsible for the upgrade of other buildings in the Green Point district were also appointed to prepare conceptual design drawings of the ECO Centre. Their brief called for the design of a green building that is a demonstration of sustainable building practices. The Centre's footprint is now finalised and the detailed design is being translated into artist's impressions to be used for international fundraising purposes (with an estimated R35 million required for construction). The following will be associated with the ECO Centre:

- A worm farm
- The biodiversity showcase garden
- Organic vegetable gardens and vegetable allotments
- Play areas for youngsters
- A public art pavilion and outdoor art
- A recycling drop-off centre and demonstration area
- A bicycle rental facility.



Umgeni River Estuary Green Hub Building (eThekweni Municipality, 2010)

FIGURE 14. LEGACY SUMMARY FOR BIODIVERSITY

REFORESTATION AND HABITAT RESTORATION

**Durban** 104,000 indigenous trees planted in partnership with Wildlands Conservation Trust. Plans for a further 100,000 trees to be planted on alien-infested tribal land.

BIODIVERSITY EDUCATION AND TOURISM PROMOTION

**Cape Town** ECO Centre and Biodiversity Park (currently being developed)  
**Durban** Green Hub Centre, currently awaiting a private sector partner  
**Mbombela** Cooperation of schools for Bergvlam Stream rehabilitation and promotion of bird-watching activities for local tourism

WETLAND AND RIVER MANAGEMENT AND RESTORATION

**Cape Town** Creation of new wetlands in Biodiversity Park, Green Point  
**Durban** Dune protection and alien vegetation clearing around the Umgeni River Estuary; Princess Magogo Stadium wetland restoration  
**Mbombela** Rehabilitation of Bergvlam Stream; restoration of the large Matsafeni wetland upstream of Mbombela Stadium  
**Polokwane** R10 million towards the restoration of a 3.5 km reach of the stream, removing alien vegetation  
**Rustenberg** Restoration and incorporation of wetland into stormwater management plan  
**Tshwane** 284 ha of alien vegetation cleared

### 8.3 Outcomes

AS THE UNEP YEAR OF BIODIVERSITY, 2010 was marked by a unified effort across government, parastatals and private organisations to address biodiversity issues in South Africa. A long term and innovative view was taken with projects – the results of which can hopefully be enjoyed by generations still to come.

Although opportunities to address biodiversity issues were not as obvious in comparison to energy and water conservation projects, which could be addressed within the stadium design, several projects stand out as having maximised the potential benefits for biodiversity, including promotion of nature-based tourism and educational facilities.

In many cases, true “legacy” projects, were those borne out of the World Cup, but are ongoing projects that will take (in some cases) several more years before they are fully realised. The momentum created by the World Cup will hopefully see these projects through to completion and allow them to fulfil their potential in terms of educating the public about biodiversity, promoting tourism and enhancing biodiversity throughout South Africa.

