3.5 Biodiversity

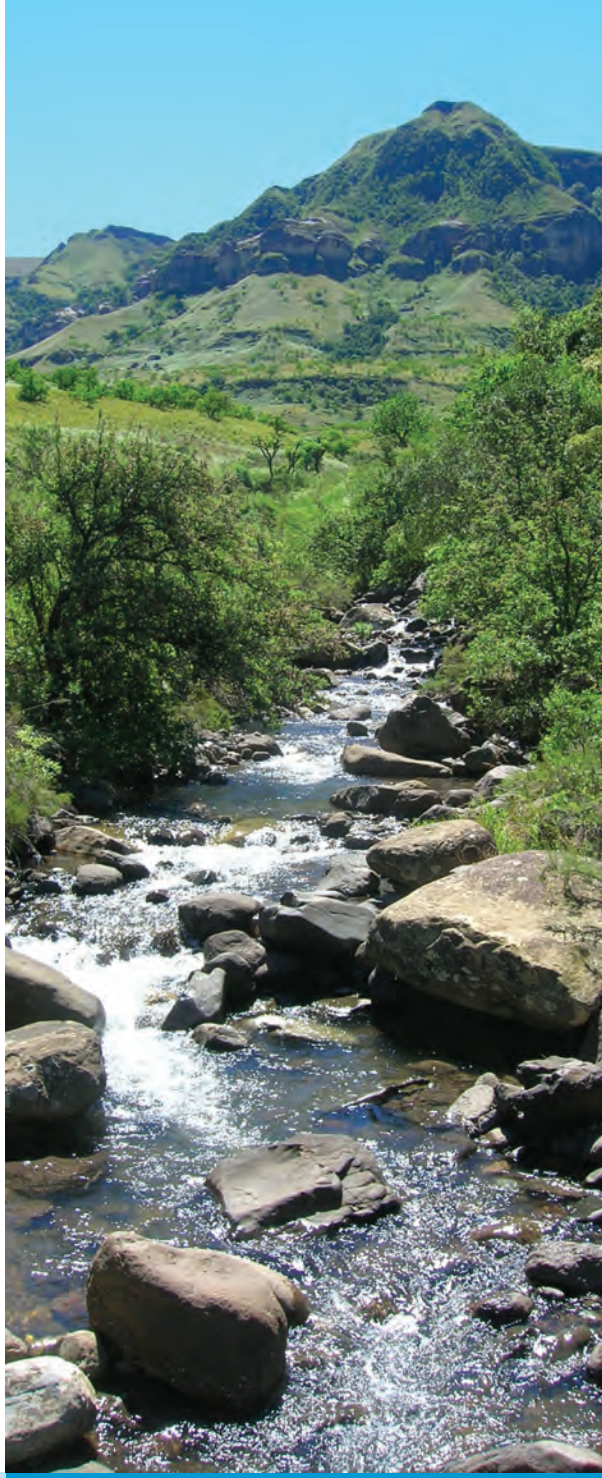
OVERVIEW

Biodiversity is variously defined from a simple "life on earth" to the more comprehensive "the variety of life on Earth at all its levels, from genes to ecosystems, and the ecological and evolutionary processes that sustain it". Whatever the definition, our lives are dependent on it. Biodiversity is essential for ensuring ongoing provision of ecosystem services such as the production of clean water, prevention of erosion, carbon storage (to counteract global warming), and clean air. The resources provided by our biodiversity support the economy and economic development, are the basis of many livelihoods, and are the source of raw materials and medicines. Our well-being is also dependent on healthy ecosystems for meeting our recreation, cultural and spiritual needs. Biodiversity will also be vital to our ability to adapt to climate change, as diverse ecosystems are more resilient to change. Biodiversity is often referred to as 'insurance for life itself'.

Despite the fact that people's wellbeing relies on it, the loss of biodiversity due to human activities has been more rapid in the past 50 years than at any other time in human history. Over the past few hundred years, species extinction rates have increased by as much as 1,000 times above background rates that were typical over Earth's history.[27] At least 60% of the ecosystem services that have been measured are declining rapidly worldwide, because of the ongoing conversion and fragmentation of natural habitat, climate change, invasions by alien species, pollution of air, water and land, and other direct and indirect drivers of environmental change[28].

Biodiversity in South Africa

South Africa is one of the world's most biologically diverse countries and contains three globally recognised biodiversity hotspots; the Cape Floristic Region, the Succulent Karoo, and Maputaland-Pondoland - an area shared with Mozambique and Swaziland. In keeping with international commitments to conserve this biodiversity, South Africa has put national legislation in place, and a National Biodiversity Strategy and Action Plan (NBSAP) have been developed. At the WSSD, 2002 in Johannesburg a further commitment was made to achieving a significant reduction in the current rate of loss of biological diversity by 2010. However, biodiversity loss continues to increase and recent studies have shown that 34% of our terrestrial ecosystems are threatened[29]. Loss of bio-diversity undermines our economy, livelihoods, health and quality of life,



Drakensberg

and reduces options for future generations. The destruction of natural habitats to provide land for other uses is one of the most significant causes of biodiversity loss in South Africa[30].

At the same time, South Africa's biodiversity provides an important basis for economic activity and development. The tourism industry, including nature-based tourism and sporting events, other industries such as fishing, horticultural and agricultural industries based on indigenous species, aspects of our film industry, and medicinal applications of indigenous resources, are all dependent on these resources. Achieving our national Sustainable Development goals, poverty reduction and enhanced human well-being, are also dependent on how effectively we conserve biodiversity.

Biodiversity plans that identify significant or sensitive ecosystems or habitats, critical ecological processes, and priority areas for conservation have also been developed at both provincial and local levels. Cape Town, for example, has a well-developed municipal **Biodiversity Strategy** with a network of core conservation sites under management. Many other provinces also have biodiversity plans that act as key informants in spatial development plans and frameworks, and will inform future bioregional plans e.g. Mpumalanga, KwaZulu Natal.

[27] Millenium Ecosystem Assessment, 2005

[28] Millenium Ecosystem Assessment, 2005

[29] National Spatial Biodiversity Assessment, 2004

[30] DEAT Environmental Outlook, 2007

Key Biodiversity Conventions/ Legislation/ Policies in South Africa:

- Convention on Biological Diversity
- Ramsar Convention
- National Environmental Management Act, (Act 107 of 1998)
- The National Environmental Management: Air Quality Act (Act 39 of 2004)
- National Environmental Management: Biodiversity Act, (Act 10 of 2004)
- National Environmental Management: Protected Areas Act, (Act 57 of 2003)
- National Environmental Management: Integrated Coastal Management bill
- Marine Living Resources Act, (Act 18 of 1998)
- National Water Act, (Act 36 of 1998)
- Conservation of Agricultural Resources Act (Act 43 of 1983)
- National Biodiversity Strategy and Action Plan, 2005
- Local Authority strategies e.g. Cape Town's IMEP (Integrated Metropolitan Environmental Policy) including the Biodiversity Strategy

Sporting events and biodiversity

The principal negative impacts on biodiversity associated with sporting facilities and events relate to their location and layout including the design and management of the facilities. Further information on this aspect can be found in the section on Design and Construction in this handbook.

In general, sporting events should avoid impacting negatively on any areas identified in biodiversity plans, as well as on any protected areas. Event greening should aim to minimise the threats to biodiversity from such things as habitat destruction, insensitive location and layout of development, the introduction of invasive alien species, pollution to air, water and land, and climate change.

The Ethekwini Environmental Services Management Plan (Open Space System)

The Ethekwini Open Space System (D'MOSS) now called Ethekwini Environmental Services Management Plan was designed and launched in 1989 in the Durban Municipal Area(DMA). As a result, a network of open space conservation and recreation areas, linked by open space corridors, was created in the previous municipal area. The aim of D'MOSS is to preserve the city's ecological diversity and enhance living environments. The D'MOSS system was updated and extended in 1998 to include the whole metropolitan area through the development of a D'MOSS Framework Plan.

During the preparation of the plan, all potential metropolitan open space was identified, **mapped** and quantified in order to create an inventory of the open space 'assets' within the DMA. The various types of open spaces and ecosystems in the city provide varying quantities and mixes of environmental goods and services, each of which have specific values, e.g. wetlands are worth around R 200, 000 per hectare per annum while forests have a value of around R 21, 000 per hectare per annum. In general, more diverse natural landscapes have greater value since they provide a wider range of services. Research in the field is ongoing, but currently available figures are widely accepted as a useful guide and tool for providing 'order of magnitude' estimates of the value of open space to humanity. Using the outcomes of this research it has been estimated that the total replacement value of the environmental goods and services supplied by the 2002 open space system is R 3.1 billion per annum. It is noteworthy that this excludes the value of the role of open space in the tourism industry of Durban, which itself was estimated to be worth R3.3 billion in 2001.

Source:
www.durban.gov.za/durban/services/departments/environment/environmental_policies/open_space_planning/

On the other hand, sporting events provide an opportunity to protect and enhance the biodiversity of both urban and rural areas in and around host cities and countries. New facilities may be accompanied by opportunities to expand or establish urban parks, the protection and restoration of sensitive natural environments and city-wide urban greening with indigenous species. An event could make financial contributions to the establishment and/or management of conservation areas in a host city or country. Opportunities for raising awareness about the natural heritage of a host city or region also arise through events and their marketing, and media activities.

In recognition of the impact of sport on nature and biodiversity, the IOC has requested all sporting federations to adopt a universal declaration governing the impact of sport on nature and has issued the statement: "The world we live and work in, we enjoy in sport and relaxation, is wondrous; let us present an even more wonderful world to the generations still to leave footprints on this world, footprints that are transient and non-destructive".

OBJECTIVES

The key objectives for sporting events with respect to Biodiversity are:

1. Conservation of biodiversity
2. Promotion of urban greening
3. Protection of important and sensitive urban ecosystems
4. Raising awareness about the natural heritage of the host city/country/region.

Two Oceans Marathon, Cape Peninsula

Objective 1:
Conservation of biodiversity

A Biodiversity Conservation Strategy for the event, associated facilities and/or the venues to be used should be developed at the earliest possible stage of planning. The location, siting, layout, design and management of sporting facilities should be carefully selected to avoid negative impacts on important biodiversity and to make a positive contribution to conservation where at all possible. Since pollution of air, water and land, inefficient use of water and energy, climate change, and unsustainable land use practices all have an adverse effect on biodiversity, it is important to consider the other sections in this guideline when reading this section.

This objective may include projects with a local to national or even a global focus, campaigns to raise the profile of threatened or protected ecosystems or species, or demonstration projects of restoration programmes. Contribution to regional or local conservation plans, initiatives and/or funds should be considered, where possible. If sensitively planned, sporting venues may provide opportunities for biodiversity conservation by protecting or restoring and managing natural habitat and by following relevant guidelines (e.g. the Audubon International [31]). The Kenilworth Racecourse in Cape Town is a good example of biodiversity conservation being supported by a sporting organisation – see the following Text Box.

[31] Audubon Cooperative Sanctuary Program for Golf Courses - www.audubonintenational.org/programs/acss/golf.htm

Case Study
Kenilworth Racecourse

In the centre of the privately owned Kenilworth racetrack, the oval contains 41ha of remnant vegetation described as Sand Plain Fynbos of which only 1.7% is conserved. A conservation area, the Kenilworth Conservation Area (KCA), has been established which contains a total of 331 different plant species. Nineteen plant species are listed as Red Data species, and six species occur only in the KCA. The area is currently being restored in partnership between the Western Cape Nature Conservation Board (CapeNature), Kirstenbosch National Botanical Garden and the Millennium Seed Bank. One of the challenges for the management of the area is that the Sand Plain Fynbos needs fire to maintain an optimum level of biodiversity, so in 2005, 10 ha of the KCA were burned by Cape Nature for the first time in 100 years. www.sanbi.org/

Objective 2:
Promotion of urban 'cleaning and greening'
This involves typical urban landscaping such as extensive tree and shrub planting that may be around the venue, on approaches to the city, or on major transport or pedestrian circulation or access routes. Cleaning of rivers and natural areas would benefit biodiversity and the overall urban aesthetic.

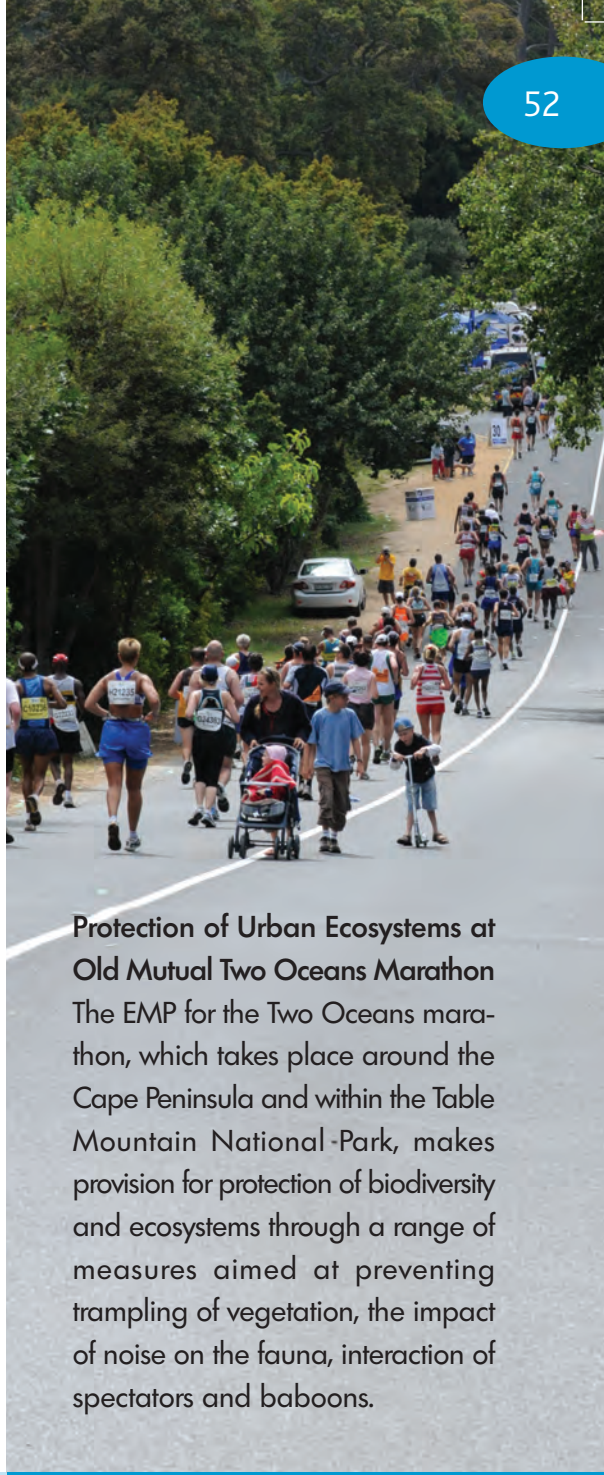
Objective 3:
Protection and restoration of urban ecosystems
Major sporting events such as the 2010 FIFA World Cup™ may include the establishment, extension or upgrading of urban parks associated with venues. These should aim to restore or re-introduce locally occurring indigenous species to 'showcase' local biodiversity and minimise maintenance requirements and water use. Opportunities may exist to protect and/or restore priority habitats (e.g. as identified in biodiversity plans) or sensitive areas (e.g. wetlands or water courses), and/or to create natural linkages between priority areas for conservation that would provide recreational amenities for the participants of the event and leave a legacy for the host region.

Objective 4:
Raising awareness about the natural heritage of the host region
Fundamental to this objective would be the development of a campaign to raise awareness of staff, volunteers, participants and the public about the value and uniqueness of South African biodiversity in general, and about 'special' habitats or species in particular, and what people can do to conserve them. Beyond the event venues and host cities, campaigns could be launched to encourage an interest in the natural areas and wildlife of the host country or region as a whole. Opportunities to use sporting heroes to communicate these messages about biodiversity should be used to their fullest potential.

STRATEGIES

In formulating strategies for taking biodiversity into account in the planning of sporting events, it is essential to liaise with all relevant environmental /biodiversity conservation /authorities and the main NGOs and CBOs active in the target area, to determine the priority biodiversity issues in the city or province, and identify opportunities for collaboration and contribution to conservation.

Recommended strategies for each of the objectives outlined above are as follows:



Protection of Urban Ecosystems at Old Mutual Two Oceans Marathon
The EMP for the Two Oceans marathon, which takes place around the Cape Peninsula and within the Table Mountain National Park, makes provision for protection of biodiversity and ecosystems through a range of measures aimed at preventing trampling of vegetation, the impact of noise on the fauna, interaction of spectators and baboons.

Conservation of biodiversity

Phase 1a : Planning and Preparation

- Develop a Biodiversity Conservation Strategy that identifies priorities in terms of maintaining and enhancing biodiversity.
- Undertake environmental assessments or Environmental Impact Assessments where required) for all new facilities and for outdoor events, to ensure adverse effects on biodiversity are mitigated and positive effects are optimised.
- Ensure that the sporting facility's location avoids priority areas for biodiversity conservation, sensitive or special ecosystems (e.g. wetlands, dynamic ecosystems, floodplains) and avoids negatively impacting on areas that deliver important ecosystem services (e.g. watercourses). The siting and layout should also avoid fragmenting natural habitat and ensure the retention of corridors of natural vegetation linking to adjacent natural areas.
- The **Design** of facilities should consider such things as:

- Providing refuges for fauna within landscaping structures and features e.g. dry-packed rock walls or log walls provide more habitat for invertebrates and reptiles than fences, small wetlands and ponds could provide effective habitat for amphibians rather than capturing runoff in pipes,
- Provide habitats where possible on buildings e.g. bird nests, vegetated roofs.
- Avoid over-lighting venues to reduce impact on nocturnal species.
- Allow for appropriate management (e.g. some ecosystems require fire to persist).

- Choice and sourcing of materials:

- Avoid using building materials for construction or furnishing of venues or temporary structures that are not obtained from sustainably managed and certified sources (e.g. hardwoods from certified sustainable forests).

Phase 1b: Management of the construction:

- Prepare and implement Environmental Management Plans on construction sites. EMPs might include such measures as:

- Minimise the 'footprint' of construction by clear demarcation of sensitive or 'no go' areas, and areas for materials storage.
- Collect indigenous plants for use in landscaping post-construction, and rescue and relocate fauna on venue construction sites, where appropriate, as advised by a specialist.
- Use locally-occurring indigenous plants in landscaping.
- Ensure that implementation of mitigation or management measures is monitored by an ecologist during construction.
- Implement programmes to eradicate invasive alien species around or close to venues and ensure that building materials do not introduce such species.
- Participate in river Catchment Management Programs to conserve aquatic species and communities.

Phase 2: Staging Events and Maintaining Facilities

- Prepare and implement Environmental Management Plans (EMPs) to manage sites during their operational life, and during outdoor events. EMPs might include such measures as the following:

- Limit access to priority areas for conservation and/or sensitive areas during sporting events by creating and monitoring a buffer zone between these areas and event venues.
- Control movement of visitors across natural spaces by using clear signposting of facilities and guides, and provide adequate route maps and path networks.
- Avoid or minimize use of pesticides, herbicides and fertilizers.
- Clear invasive alien species on a regular basis.

- Use sustainably harvested indigenous species of cut flowers at venues to support local industries and livelihoods.
- Source food, wine from biodiversity friendly/certified and organic sources (e.g. Biodiversity and Wine Initiative).

• Ensure that management measures are implemented.

Phase 3: Legacy

• Rehabilitate or restore, where applicable, natural areas that were degraded during the event.

• Monitor and manage the implementation of conservation projects established via the event to ensure that they deliver desired outcomes.

• Synthesise information on any special features of the local biodiversity (ecosystems, species of plant or animal and their particular value or significance), and publish or broadcast this information. Provide interpretive signage on site to raise awareness among participants and catalyse support for conservation funds or initiatives.

• Fund and/or encourage support for conservation projects for any threatened habitats or species in the area of the event. These strategies would increase government and public support for an event.

2. Promotion of urban cleaning and greening

• Implement extensive urban greening programmes that significantly increase the area of indigenous vegetation in the host city and serve to connect areas of natural habitat within the city where at all possible.

• Establish tree and plant maintenance and monitoring contracts.

• Use locally-occurring indigenous, water-wise species for new landscaping. Selection of species should consider future predicted changes in climate.

3. Protection and restoration of urban ecosystems

• Establish or extend existing urban parks through:
- the protection and management of natural areas identified in biodiversity plans and/or by the local/provincial conservation agency as being a priority for conservation;
- restoration of degraded areas identified in biodiversity plans and/or by the local/provincial conservation agency as being a priority for conservation;
- the protection and management of sensitive ecological areas (e.g. wetlands or water courses); and
- the linking, protection and management of significant remnants of natural habitat within the urban fabric.

• Prepare and implement Management Plans for these areas.

• Create or extend viable habitat for locally-occurring and threatened fauna e.g. ponds, road underpasses linking remnant habitats.

• Conduct ecological monitoring and research to provide ongoing assessment, evaluation and improvement of urban parks.

4. Raising awareness about the natural heritage

• Launch or support existing campaigns with Conservation NGOs, local or provincial conservation agencies to instil national pride of natural heritage.

• Involve key sports icons participating in the event as biodiversity champions to convey messages about the value of biodiversity and about conservation projects the event is supporting.

• Host competitions on national websites with videos and stories from local conservation projects.

- Provide information on the protected areas to visit in the host region.
- Train volunteers and guides in communication of biodiversity features around event venues
- Use cartoon mascots in media to provide environmental/conservation messages, aimed at engaging with the youth.
- Hold nature photography exhibitions and competitions.
- Contract with LCD advertising companies (airlines, airport, buses etc) for free broadcasting time about conservation issues.
- Measure the effectiveness of campaigns through surveys.

Case Study
Pick 'n Pay Argus Cycle Tour

The Pick 'n Pay Argus Cycle Tour takes place around the Cape Peninsula in March each year with 35,000 riders and many supporters. Two-thirds of the route runs through a National Park and World Heritage Site. The cycle tour was the first cycling event in the world to incorporate a comprehensive EMP. The Plan has an emphasis on waste management, but also looks at other environmental impacts the Tour could have – from noise pollution, helicopter flight paths, fire risks, traffic management and structural safety on route, to ensuring that everybody working on the cycle route is properly briefed.

Today, the International Cycling Union (UCI) requires all events under its auspices to have a similar plan and the Argus EMP has been accepted as the world standard for cycling events. This multi-faceted Plan ensures that every measure is taken to take care of the environment and to ensure the safety of our cyclists, and makes the Cycle Tour one of the most environmentally friendly events in the country!

Source: Ken Sturgen [pers comm]

MONITORING AND EVALUATION

Project-specific indicators to evaluate the success of each objective will need to be identified. Examples of indicators that relate to Biodiversity Conservation as well as targets that could be set to monitor performance, are provided in the following Table:

TABLE 3.5.1.: Sample Biodiversity Monitoring and Evaluation Indicators

OBJECTIVE	INDICATOR	TARGET	RESULT	COMMENT RE SUCCESS
Biodiversity conservation	Population size of threatened species	50	55	Viable and growing population
	Area of invasive aliens removed	5000m^2	8000m^2	Partnering with an existing municipality programme enhanced this result
Urban Greening	Increase in area of indigenous vegetation + survival after 1 yr	20%	15%	Loss of some plants/trees due to extreme weather
	Number of trees planted	5000	4567	Some sites were not accessible in time
Urban Ecosystems	Additional % area of City protected and managed to provide habitat for priority ecosystems	2%	2%	Target achieved
Raising awareness about the natural heritage	Number of participants that entered competitions/visited exhibitions during the event based on predicted figures/	10 000	8745	Additional funds would be required to increase these numbers