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| GENERAL NOTICE | | |
| Environmental Affairs and Tourism, Department of | | |
| <i>General Notice</i> | | |
| 801 | National Environmental Management: Biodiversity Act (10/2004): National Biodiversity Framework for South Africa published for public information and comments | 3 30027 |

GENERAL NOTICE

NOTICE 801 OF 2007**DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM****NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT 10 of 2004)**

I, Marthinus Christoffel Johannes van Schalkwyk, Minister of Environmental Affairs and Tourism, hereby in terms of section 100 of the Act, publish for public information and comments the following:

NATIONAL BIODIVERSITY _ FOR SOUTH AFRICA

To ensure that all the relevant stakeholders are consulted and to streamline the consultation process, interested and affected stakeholders are invited to submit written comments to the department.

Please submit all written comments to:

The Director-General
Department of Environmental Affairs and Tourism
Private Bag X447
PRETORIA
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For Attention: Mr Kiruben Naicker

Enquiries should be directed to Mr Kiruben Naicker: Tel. (012) 310 3088; knaicker@deat.gov.za, or fax number (012) 320 7026.

Closing date: 29 July 2007



MARTHINUS VAN SCHALKWYK, MP
MINISTER OF ENVIRONMENTAL AFFAIRS AND TOURISM

SOUTH AFRICA'S

NATIONAL BIODIVERSITY FRAMEWORK

FINAL DRAFT

MARCH 2007



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Acronyms

| | |
|----------|---|
| ABS | Access and benefit sharing |
| ASGISA | Accelerated and Shared Growth Initiative of South Africa |
| C.A.P.E. | Cape Action for People and the Environment |
| CBD | Convention on Biological Diversity |
| CMA | Catchment Management Agency |
| DAEA | KwaZulu-Natal Department of Agriculture and Environment Affairs |
| DALA | Mpumalanga Department of Agriculture and Land Administration |
| DEA&DP | Western Cape Department of Environment Affairs and Development Planning |
| DEAT | Department of Environment Affairs and Tourism |
| DEAET | Eastern Cape Department of Economic Affairs, Environment and Tourism |
| DLA | Department of Land Affairs |
| DME | Department of Minerals and Energy |
| DoA | Department of Agriculture |
| DPLG | Department of Provincial and Local Government |
| DPW | Department of Public Works |
| DST | Department of Science and Technology |
| DTEC | Northern Cape Department of Tourism, Environment and Conservation |
| DTEEA | Free State Department of Tourism, Economic and Environment Affairs |
| DTI | Department of Trade and Industry |
| DWAF | Department of Water Affairs and Forestry |
| ECPB | Eastern Cape Parks Board |
| EKZNW | Ezemvelo KwaZulu-Natal Wildlife |
| EWT | Endangered Wildlife Trust |
| GDACE | Gauteng Department of Agriculture, Conservation and Environment |
| GMO | Genetically modified organism |
| IAS | Invasive alien species |
| IUCN | World Conservation Union |
| KZN | KwaZulu-Natal |
| LTPS | Limpopo Tourism and Parks Board |
| MCM | Marine and Coastal Management |
| MDTP | Maloti-Drakensberg Transfrontier Project |
| MTPA | Mpumalanga Tourism and Parks Agency |
| NEMA | National Environmental Management Act |
| NEPAD | New Partnership for Africa's Development |

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| NBF | National Biodiversity Framework |
| NBSAP | National Biodiversity Strategy and Action Plan |
| NFSD | National Framework for Sustainable Development |
| NSBA | National Spatial Biodiversity Assessment |
| NsDP | National Spatial Development Perspective |
| NWPTB | North West Parks and Tourism Board |
| sADC | Southern African Development Community |
| SANSI | South African National Biodiversity Institute |
| SAN Parks | South African National Parks |
| SKEP | Succulent Karoo Ecosystem Programme |
| STEP | Subtropical Thicket Ecosystem Programme |
| SO | Strategic Objective |
| TFCA | Transfrontier Conservation Area |
| WESsA | Wildlife and Environment Society of South Africa |
| WWF-SA | World Wide Fund for Nature South Africa |

Executive Summary

The purpose of the NBF

The NSF provides a framework for conservation *and* development. The NSF aims to:

- Focus attention on the most urgent strategies and actions required for biodiversity management
- Point to roles and responsibilities of key stakeholders, including key organs of state whose mandates impact directly on biodiversity management

The purpose of the NBF is *not* to:

- Describe South Africa's biodiversity and its importance in detail
- Reiterate South Africa's commitments to conserving biodiversity as a signatory of the Convention on Biological Diversity
- Describe the policy and legislative framework for biodiversity conservation in South Africa
- Give a comprehensive list of all actions required to conserve and manage South Africa's biodiversity

The NSF will be reviewed at least every five years, providing an opportunity to take stock of progress, review priorities, and realign efforts. The NSF is thus a short- to medium-term tool. Its aim is not to be comprehensive, but rather to focus collective attention and effort on the set of activities that will make the most difference.

Who should use the NBF

Key intended users of the NSF include:

1. Organs of state whose core business includes biodiversity conservation
2. Organs of state whose core business is not biodiversity conservation, but whose policies, programmes and decisions impact directly and substantially on how biodiversity is managed
3. Government-led programmes
4. NGOs wishing to make a contribution to biodiversity conservation in South Africa
5. The private sector, particularly those production sectors whose activities contribute to the major pressures on South Africa's biodiversity, such as loss of natural habitat, over-abstraction of freshwater resources, and over-harvesting of marine resources

6. Bioregional programmes, which are multi-sectoral, multi-institutional, landscape-wide conservation initiatives at the regional level

How does the NSF relate to the NBSAP and the NSBA

The NSF rests on two preceding documents, both of which were based on extensive stakeholder consultation: the National Biodiversity Strategy and Action Plan (NBSAP) and the National Spatial Biodiversity Assessment (NSBA).

The NBSAP, finalised in May 2005 after a two-year development process, sets out a comprehensive long-term strategy for the conservation and sustainable use of South Africa's biodiversity, including medium- and long-term targets.

The NSBA provides a spatial picture of the location of South Africa's threatened and under-protected ecosystems, and focuses attention on geographic priority areas for biodiversity conservation. South Africa's first NSBA was undertaken in 2004, and published in April 2005. The NSBA will be updated every five years.

The NSF is informed by both the NBSAP and the NSBA. It draws together key elements of each, and focuses attention on the immediate priorities, both spatial and thematic, for the next five years.

Why South Africa's biodiversity matters

South Africa's biodiversity provides an important basis for economic growth and development, in obvious ways such as providing a basis for our fishing industry, rangelands that support commercial and subsistence farming, horticultural and agricultural industry based on indigenous species, our tourism industry, aspects of our film industry, and commercial and non-commercial medicinal applications of indigenous resources. Keeping our biodiversity intact is also vital for ensuring ongoing provision of ecosystem services such as production of clean water through good catchment management, prevention of erosion, carbon storage (to counteract climate change) and clean air. Loss of biodiversity puts aspects of our economy and quality of life at risk, and reduces socio-economic options for future generations.

The social impacts and economic costs of not managing ecosystems in a sustainable manner is high, as is demonstrated through land degradation, loss of ecosystem resilience)

loss of freshwater resources, the intensification of the global carbon cycle and resulting climate change, the loss of fishing stock and the deterioration of air quality. Based on several South African case studies, the average rural person that has open access to mostly communal lands derived a largely unaccounted value of R800-R1000 per person per annum from wild products and ecosystem grazing services to support their livestock. That is an average value of R6000 per household per annum.

For the whole of South Africa, the added value of ecosystems in the production of biological resources as well as the final consumption of ecosystems was recently conservatively estimated at a baseline reference value of R27 billion per annum, or R20 000 per terrestrial km², with a spread of around R30 000/km² for savannas and grasslands to R5 500 per km² for the Karoo. Indirect use values (mostly notably grazing and pollination inputs) account for two thirds of this value, while direct consumptive use values (nature's share of timber resources, aquatic resources, crops and plant resources and animal resources) account for 28% and non-consumptive use (nature based tourism) for 6% of total value.

It is therefore obvious that economic valuation of biodiversity is needed and can help in better informing decision-making processes.

Major pressures on biodiversity in South Africa

Many people are not aware of the impact of ordinary day-to-day activities on the functioning of ecosystems, and often see biodiversity conservation as being about protecting individual rare or threatened species rather than maintaining the integrity of ecosystems on which we depend for survival.

The major pressures on South Africa's biodiversity are:

- loss and degradation of natural habitat, in terrestrial and aquatic ecosystems
- invasive alien species
- over-harvesting of species, especially in the marine environment
- over-abstraction of water
- climate change

The challenge: conservation AND development, not conservation OR development

The challenge we face in addressing these pressures on biodiversity is not to conserve OR to develop, but rather how to conserve AND develop. It's all about *where* and *how*

development takes place. The biodiversity sector is developing increasingly effective tools to support and streamline environmental decision-making and ensure that development is appropriate. Key among these are published bioregional plans in terms of the Biodiversity Act, which will identify critical biodiversity areas, including ecological corridors and important catchments, and give land-use planning and decision-making guidelines for these critical biodiversity areas.

Priority actions for sustainable use and conservation of South Africa's biodiversity

The NBSAP is a twenty-year strategy which identifies five strategic objectives and a comprehensive set of outcomes for each. **The NSF draws out immediate priorities for the next five years** within each of the Strategic Objectives (SOs) of the NBSAP. The priority actions, summarised in the table below, are organised according to the five SOs:

- **SO 1: An enabling policy and legislative framework** integrates biodiversity management objectives into the economy
- **SO 2: Enhanced institutional effectiveness and efficiency** ensures good governance in the biodiversity sector
- **SO 3: Integrated terrestrial and aquatic management** minimizes the impacts of threatening processes on biodiversity, enhances ecosystem services and improves social and economic security
- **SO 4: Human development and well-being is enhanced through sustainable use of biological resources** and equitable sharing of the benefits
- **SO 5: A network of conservation areas** conserves a representative sample of biodiversity and maintains key ecological processes across the landscape and seascape

[see Table 1 on p x]

Regional co-operation

Priorities for co-operation between South Africa and other Southern African countries in relation to biodiversity are:

- Strengthen and improve the development of integrated management and tourism plans of the transfrontier conservation areas
- Develop and implement appropriate incentives for biodiversity conservation and its sustainable use in cooperation with our neighbouring countries
- Develop, implement and strengthen programmes for international scientific collaboration, sharing of information and technology transfer

- Develop and implement a coordinated regional programme to increase awareness, knowledge and appreciation of biological resources at various levels
- Strengthen the research and development capacity of the protected area system

Monitoring and reviewing the NSF

The NSF is the joint responsibility of a range of lead agencies and supporting partners, with DEAT and SANSI playing a co-ordinating, catalysing role in addition to implementing specific priority actions.

The NSF must be reviewed every five years. The review should be led by DEAT in collaboration with all lead agents and other key stakeholders, and should involve:

- Assessing progress towards implementing priority actions identified in the current NSF
- Assessing progress towards achievement of the NSSAP strategic objectives
- Reviewing and revising priority actions for the following five-year period, and compiling these into an updated NSF
- Publishing the updated NSF

The Biodiversity Act toolbox

The Biodiversity Act provides for a range of mechanisms for sustainable use and conservation of biodiversity, in addition to the NBF. These other mechanisms include:

- Guidelines for publishing bioregional plans (expected to be published in 2007)
- Regulations on invasive alien species (expected to be published in 2007)
- Regulations on access and benefit sharing (expected to be published in 2007)
- Regulations on bio-prospecting (expected to be published in 2007)
- Regulations on Threatened and protected species (expected to be published in 2007)
- Norms and standards on hunting (expected to be published in 2008)
- Listing of threatened and protected species (national list expected to be published in 2007)
- Listing of threatened and protected ecosystems (identified as a priority action in the NSF, first national list expected to be published in 2008)
- Norms and standards for biodiversity management plans for species (expected to be published in 2007)
- Norms and standards for biodiversity management plans for ecosystems (expected to be published in 2008)

TAB E 1: LEAD AGENTS, PRIORITY ACTIONS AND 2012 TARGETS:

1.1 DEAT - BIODIVERSITY & CONSERVATION

| Priority Actions per Strategic objective | | 2012 TARGETS |
|--|--|---|
| SO 1: Enabling policy and legislative framework | | |
| 1.1 Make the case for the value of biodiversity (4.1.1, P 21) | | Partial economic valuation of South Africa's biodiversity is completed, and has been presented effectively to key decision-makers and the public. |
| 1.2 Integrate biodiversity considerations into fiscal policy (4.1.2, p21) | | At least two fiscal instruments and/or market mechanisms for biodiversity conservation are developed, and pilots are underway. |
| 1.2.1 | <i>Fiscal instruments that encourage private landowners to contribute their own resources to effective biodiversity management</i> | |
| 1.2.2 | <i>Mechanisms that allow for payment for ecosystem services, and reinvestment of the revenues generated in securing the health ecosystems</i> | |
| 1.3 Integrate biodiversity considerations into trade policy by developing tools for supporting and streamlining environmental decision-making (4.1.3, p22) | | Ecosystem guidelines for environmental assessment, generic terms of reference for biodiversity specialist studies in EIAs, a decision-making framework to guide trade-offs where these are unavoidable, and a policy framework for biodiversity offsets have been developed and are being applied nationally. |
| 1.3.1 | <i>Ecosystem-specific guidelines for environmental assessment, and generic terms of reference for biodiversity specialist studies conducted as part of EIAs.</i> | |
| 1.3.2 | <i>Framework for guiding trade-offs that decision-makers have to make.</i> | |
| 1.3.3 | <i>Policy framework for biodiversity offsets</i> | |
| 1.4 Develop a regulatory framework for the prevention, containment and eradication of invasive alien species (4.1.4, p 23). | | IAS regulations are finalised and published. (This should be achieved by 2007.) |
| 1.5 Develop a regulatory framework for access and benefit sharing (ASS) (4.1.5, P 24). | | ASS regulations are finalised and published. (This should be achieved by 2007.) |
| SO 2: Enhanced institutional effectiveness and efficiency ensures good governance in the biodiversity sector | | |
| 2.1 Establish a capacity building programme within the biodiversity sector to address transformation (4.2.1, p24). | | National biodiversity conservation capacity building programme, reflecting specific employment equity targets for all key research and implementing agencies in the biodiversity sector, is developed and underway. |
| 2.3 Establish a national biodiversity research strategy (4.2.3, p26) | | National biodiversity research strategy is developed, recognised by all key stakeholders, and is guiding allocation of research efforts and funding. |

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| <p>2.4 Establish a national monitoring, evaluation and reporting framework for biodiversity (4.2.4, p26).</p> | <p>National biodiversity monitoring and reporting framework is established and being used as the basis for annual reports to parliament and is informing policy direction and implementation. Monitoring and evaluation frameworks for provincial conservation authorities and bioregional programmes feed into the national monitoring and reporting framework.</p> |
| <p>2.5 Establish a national programme to build the capacity of local government to include biodiversity opportunities and constraints in integrated development planning and other municipal functions (4.2.5, p 27)</p> | <p>A national programme to build municipal capacity has been established and is underway, focusing initially on municipalities with, for example, high numbers of threatened ecosystems.</p> |
| <p>2.6 Establish pilot projects to explore mechanisms for integrated natural resource management at the district and local level (4.2.6, p 28)</p> | <p>Pilots for district natural resource co-ordinators and/or other mechanisms for integrated natural resource management are underway in at least four districts.</p> |
| <p>2.7 Support the development and strengthening of bioregional programmes (4.2.7, p 28).</p> | <p>The co-ordination units of the five existing bioregional programmes (C.A.P.E., SKEP, STEP, Grasslands and Wild Coast) are funded by government and effective management structures have been established. At least two new bioregional programmes have been established (marine, freshwater).</p> |
| <p>SO 3: Integrated management of terrestrial and aquatic ecosystems</p> | |
| <p>3.2 Publish bioregional plans in terms of the Biodiversity Act (4.3.2, p 31).</p> | <p>At least 7 bioregional plans have been published and are being used routinely to inform land-use planning and decision-making</p> |
| <p>3.3 List threatened and protected ecosystems in terms of the Biodiversity Act (4.3.3, P 31).</p> | <p>Threatened or protected ecosystems have been identified and listed, and the list has been updated at least once. Appropriate supporting material is available, and listed ecosystems are routinely taken into account in land-use planning and decision-making.</p> |
| <p>3.5 Implement the IAS regulations, and monitor implementation (4.3.5, p 34)</p> | <ul style="list-style-type: none"> • Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species. • System to monitor implementation in place |
| <p>3.6 Implementation of cross-sector policy objectives for the conservation of inland water biodiversity (4.3.6, P 35)</p> | <p>A portfolio of inland water conservation areas has been identified, and mechanisms for implementing appropriate management of these areas are being piloted in at least three Water Management Areas.</p> |
| <p>3.8 Develop and implement effective measures for the management and control of activities relating to GMOs, in order to manage their impact on the environment, (4.3.8, p 37).</p> | <p>Environmental Management System for GMOs has been developed and is routinely used.</p> |
| <p>SO 4: Sustainable use of biological resources and equitable sharing of the benefits</p> | |
| <p>4.2 Develop an implementation strategy for bioprospecting regulations (4.4.2, p 43)</p> | <p>Implementation strategy for bio-prospecting regulations has been developed, and milestones or targets identified in the strategy are being reached.</p> |
| <p>4.3 Develop the natural products sector (4.4.3, p 43).</p> | <ul style="list-style-type: none"> • Facilitate international trade. • Facilitate certification. • Grow domestic demand through increased awareness. • Strengthen natural products enterprises and supply chain management. |

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| SO 5: Expanded network of conservation areas | |
| 5.1 Finalise the 20-year protected area expansion plan, underpinned by the national biodiversity targets in the NSBA for biomes, provinces and marine biozones (4.5.1, P 47). | <ul style="list-style-type: none"> • Protected area expansion strategy finalised and supported by all key implementing agencies. • Complete, up-to-date map of protected areas widely available <ul style="list-style-type: none"> ▪ Protected area register fully populated. |
| 5.2 Implement Phase 1 of 20-year protected area expansion plan (4.5.2, p 48) | 8% of terrestrial area and 20% of marine area is included in protected area network |
| 5.3 Establish and strengthen stewardship programmes in at least five provinces (4.5.3, p 48). | At least 5 provinces have active stewardship programmes. |
| 5.4 Establish additional National Botanical Gardens (4.5.4, p 49) | At least 2 new National Botanical Gardens have been established. |

1.2 DEAT - MCM

| Priority Actions per Strategic objective | 2012 TARGETS |
|--|---|
| SO 2: Enhanced institutional effectiveness and efficiency ensures good governance in the biodiversity sector | |
| 2.3 Establish a national biodiversity research strategy (4.2.3, p26) | National biodiversity research strategy is developed, recognised by all key stakeholders, and is guiding allocation of research efforts and funding. |
| 2.4 Establish a national monitoring, evaluation and reporting framework for biodiversity (4.2.5, p26). | National biodiversity monitoring and reporting framework is established and being used as the basis for annual reports to parliament and is informing policy direction and implementation. Monitoring and evaluation frameworks for provincial conservation authorities and bioregional programmes feed into the national monitoring and reporting framework. |
| SO 3: Integrated management of terrestrial and aquatic ecosystems | |
| 3.5 Implement the IAS regulations, and monitor implementation (4.3.5, p 34) | 20Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species. System to monitor implementation in place |
| SO 4: Sustainable use of biological resources and equitable sharing of the benefits | |
| 4.1 Address illegal and unregulated fishing and seafood trade, especially of endemic line fish and abalone (4.4.1, p 42) | Linefish status reports are updated, recovery plans are implemented for 6 species and the ecosystem approach is implemented in all major commercial fisheries |
| SO 5: Expanded network of conservation areas | |

| | |
|---|---|
| 5.1 Finalise the 20-year protected area expansion plan, underpinned by the national biodiversity targets in the NSBA for biomes, provinces and marine biozones (4.5.1, P 47). | <ul style="list-style-type: none"> Protected area expansion strategy finalised and supported by all key implementing agencies. Complete, up-to-date map of protected areas widely available Protected area register fully populated. |
| 5.2 Implement Phase 1 of 20-year protected area expansion plan (4.5.2, p 48). | 8% of terrestrial area and 200/0 of marine area is included in protected area network |

1.3 SANSI

| Priority Actions per Strategic objective | | 2012 TARGETS |
|--|--|---|
| SO 1: Enabling policy and legislative framework | | |
| 1.1 Make the case for the value of biodiversity (4.1.1, P 21) | | Partial economic valuation of South Africa's biodiversity is completed, and has been presented effectively to key decision-makers and the public. |
| 1.2 Integrate biodiversity considerations into fiscal policy (4.1.2, p21) | | At least two fiscal instruments and/or market mechanisms for biodiversity conservation are developed, and pilots are underway. |
| 1.2.1 | <i>Fiscal instruments that encourage private landowners to contribute their own resources to effective biodiversity management</i> | |
| 1.2.2 | <i>Mechanisms that allow for payment for ecosystem services, and reinvestment of the revenues generated in securing the health ecosystems</i> | |
| 1.3 Integrate biodiversity considerations into trade policy by developing tools for supporting and streamlining environmental decision-making (4.1.3, p22) | | Ecosystem guidelines for environmental assessment, generic terms of reference for biodiversity specialist studies in EIAs, a decision-making framework to guide trade-offs where these are unavoidable, and a policy framework for biodiversity offsets have been developed and are being applied nationally. |
| 1.3.1 | <i>Ecosystem-specific guidelines for environmental assessment, and generic terms of reference for biodiversity specialist studies conducted as part of EIAs.</i> | |
| 1.3.2 | <i>Framework for guiding trade-offs that decision-makers have to make.</i> | |
| 1.3.3 | <i>Policy framework for biodiversity offsets</i> | |
| SO 2: Enhanced institutional effectiveness and efficiency | | |
| 2.1 Establish a capacity building programme within the biodiversity sector to address transformation (4.2.1, p24). | | National biodiversity conservation capacity building programme, reflecting specific employment equity targets for all key research and implementing agencies in the biodiversity sector, is developed and underway. |
| 2.2 Improve biodiversity information management. (4.2.2, p 25) | | Web-enabled one-stop-shop for biodiversity information established, recognised and extensively used by managers and professionals. |
| 2.3 Establish a national biodiversity research strategy (4.2.3, p26) | | National biodiversity research strategy is developed, recognised by all key stakeholders, and is guiding allocation of research efforts and funding. |

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|---|--|
| 2.4 Establish a national monitoring, evaluation and reporting framework for biodiversity (4.2.4, p26). | National biodiversity monitoring and reporting framework is established and being used as the basis for annual reports to parliament and is informing policy direction and implementation. Monitoring and evaluation frameworks for provincial conservation authorities and bioregional programmes feed into the national monitoring and reporting framework. |
| 2.5 Establish a national programme to build the capacity of local government to include biodiversity opportunities and constraints in integrated development planning and other municipal functions (4.2.5, p27). | A national programme to build municipal capacity has been established and is underway, focusing initially on municipalities with, for example, high numbers of threatened ecosystems. |
| 2.6 Establish pilot projects to explore mechanisms for integrated natural resource management at the district and local level (4.2.6, p 28) | Pilots for district natural resource co-ordinators and/or other mechanisms for integrated natural resource management are underway in at least four districts. |
| 2.7 Support the development and strengthening of bioregional programmes (4.2.7, P 28). | The co-ordination units of the five existing bioregional programmes (C.A.P.E., SKEP, STEP, Grasslands and Wild Coast) are funded by government and effective management structures have been established. At least two new bioregional programmes have been established (marine, freshwater). |
| SO 3: Integrated management of terrestrial and aquatic ecosystems | |
| 3.1 Develop provincial spatial biodiversity plans (4.3.1, P 30). | At least six provinces have spatial provincial biodiversity plans in place, with the necessary in-house capacity to maintain and update them. |
| 3.2 Publish bioregional plans in terms of the Biodiversity Act (4.3.2, p 31). | At least 7 bioregional plans have been published and are being used routinely to inform land-use planning and decision-making |
| 3.3 List threatened and protected ecosystems in terms of the Biodiversity Act (4.3.3, P 31). | Threatened or protected ecosystems have been identified and listed, and the list has been updated at least once. Appropriate supporting material is available, and listed ecosystems are routinely taken into account in land-use planning and decision-making. |
| 3.4 Work with key production sectors to minimise loss and degradation of natural habitat in critical biodiversity areas (4.3.4, P 32). | <ul style="list-style-type: none"> Guidelines for biodiversity-friendly production of biofuels have been developed and are being applied by biofuel producers. An "eco red meat" certification system has been developed. At least three other production sectors have developed wise practice guidelines to minimise their impact on biodiversity. |
| 3.5 Implement the IAS regulations, and monitor implementation. (4.3.5, p 34) | <ul style="list-style-type: none"> Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species. System to monitor implementation in place |
| 3.6 Implement cross-sector policy objectives for the conservation of inland water biodiversity (4.3.6, p 35). | A portfolio of inland water conservation areas has been identified, and mechanisms for implementing appropriate management of these areas are being piloted in at least three Water Management Areas. |
| 3.8 Develop and implement effective measures for the management and control of activities relating to GMOs, in order to manage their impact on the environment. (4.3.8, p 37). | Environmental Management System for GMOs has been developed and is routinely used. |

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| SO 4: Sustainable use of biological resources and equitable sharing of the benefits | |
| 4.1 Address illegal and unregulated fishing and seafood trade, especially of endemic line fish and abalone (4.4.1, P 42) | Linefish status reports are updated, recovery plans are implemented for 6 species and the ecosystem approach is implemented in all major commercial fisheries |
| 4.3 Develop the natural products sector (4.4.3, p 43). | <ul style="list-style-type: none"> • Facilitate international trade. • Facilitate certification. • Grow domestic demand through increased awareness. • Strengthen natural products enterprises and supply chain management. |
| 4.4 Improve knowledge of sustainable extractive use of terrestrial resources (4.4.4, p 46) | Knowledge of the extent of harvesting and limits to sustainable extractive use of at least ten medicinal plants is developed, and species management plans have been developed for at least five medicinal plants in collaboration with user groups. |
| SO 5: Expanded network of conservation areas | |
| 5.1 Finalise the 20-year protected area expansion plan, underpinned by the national biodiversity targets in the NSBA for biomes, provinces and marine biozones (4.5.1, P 47). | <ul style="list-style-type: none"> ■ Protected area expansion strategy finalised and supported by all key implementing agencies. • Complete, up-to-date map of protected areas widely available ■ Protected area register fully populated. |
| 5.3 Establish and strengthen stewardship programmes in at least five provinces (4.5.3, p 48). | At least 5 provinces have active stewardship programmes. |
| 5.4 Establish additional National Botanical Gardens (4.5.4, p 49) | At least 2 new National Botanical Gardens have been established. |

1.4 SANParks

| Priority Actions per Strategic objective | 2012 TARGETS |
|--|---|
| SO 2: Enabling policy and legislative framework | |
| 2.1 Establish a capacity building programme within the biodiversity sector to address transformation (4.2.1, p24). | National biodiversity conservation capacity building programme, reflecting specific employment equity targets for all key research and implementing agencies in the biodiversity sector, is developed and underway. |
| 2.4 Establish a national monitoring, evaluation and reporting framework for biodiversity (4.2.5, p26). | National biodiversity monitoring and reporting framework is established and being used as the basis for annual reports to parliament and is informing policy direction and implementation. Monitoring and evaluation frameworks for provincial conservation authorities and bioregional programmes feed into the national monitoring and reporting framework. |
| SO 3: Integrated management of terrestrial and aquatic ecosystems | |

| | |
|---|---|
| 3.5 Implement the IAS regulations, and monitor implementation. (4.3.5, p 34) | <ul style="list-style-type: none"> Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species. System to monitor implementation in place |
| SO 5: Expanded network of conservation areas | |
| 5.1 Finalise the 20-year protected area expansion plan, underpinned by the national biodiversity targets in the NSBA for biomes, provinces and marine biozones (4.5.1, P 47). | <ul style="list-style-type: none"> Protected area expansion strategy finalised and supported by all key implementing agencies. Complete, up-to-date map of protected areas widely available Protected area register fully populated. |
| 5.2 Implement Phase 1 of 20-year protected area expansion plan (4.5.2, p 48). | 8% of terrestrial area and 200/0 of marine area is included in protected area network |

1.5 DWAF and CMAs

| Priority Actions per Strategic objective | 2012 TARGETS |
|--|---|
| SO 3: Integrated management of terrestrial and aquatic ecosystems | |
| 3.5 Implement the IAS regulations, and monitor implementation. (4.3.5, p 34) | <ul style="list-style-type: none"> Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species. System to monitor implementation in place |
| 3.6 Implement cross-sector policy objectives for the conservation of inland water biodiversity (4.3.6, p 35). | A portfolio of inland water conservation areas has been identified, and mechanisms for implementing appropriate management of these areas are being piloted in at least three Water Management Areas. |
| 3.7 Incorporate biodiversity conservation objectives in the work of Catchment Management Agencies (4.3.7, p 36). | All CMAs that are established and operational have integrated quantitative freshwater biodiversity targets and national freshwater biodiversity priority areas into their Catchment Management Strategies. |
| 3.8 Develop and implement effective measures for the management and control of activities relating to GMOs, in order to manage their impact on the environment. (4.3.8, p 37). | Environmental Management System for GMOs has been developed and is routinely used. |

1.6 Department of Agriculture

| Priority Actions per Strategic objective | 2012 TARGETS |
|---|--------------|
| SO 3: Integrated management of terrestrial and aquatic ecosystems | |

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| 3.4 Work with key production sectors to minimise loss and degradation of natural habitat in critical biodiversity areas (Agri-South Africa and relevant industry sector organisations - 4.3.4, P 32). | Bioregion Guidelines for biodiversity-friendly production of biofuels have been developed and are being applied by biofuel producers. An "eco red meat" certification system has been developed. At least three other production sectors have developed wise practice guidelines to minimise their impact on biodiversity. al programme co-ordination units, relevant industry sector organisations, SANSI |
| 3.5 Implement the IAS regulations, and monitor implementation. (4.3.5, p 34) | <ul style="list-style-type: none"> • Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species. • System to monitor implementation in place |
| 3.6 Implement cross-sector policy objectives for the conservation of inland water biodiversity (4.3.6, p 35). | A portfolio of inland water conservation areas has been identified, and mechanisms for implementing appropriate management of these areas are being piloted in at least three Water Management Areas. |
| 3.8 Develop and implement effective measures for the management and control of activities relating to GMOs, in order to manage their impact on the environment. (4.3.8, p 37). | Environmental Management System for GMOs has been developed and is routinely used. |
| SO 4: Sustainable use of biological resources and equitable sharing of the benefits | |
| 4.3. Facilitate the development of natural products sector (4.4.3 p. 43) | <ul style="list-style-type: none"> • Facilitate international trade • Facilitate certification • Grow domestic demand through increased awareness • Strengthen natural products enterprises and supply chain management |

1.7 Department of Trade and Industry

| Priority Actions per Strategic objective | 2012 TARGETS |
|--|---|
| SO 1: Enabling policy and legislative framework | |
| 1.3 Integrate biodiversity considerations into trade policy by developing tools for supporting and streamlining environmental decision-making (4.1.3, p24) | Ecosystem guidelines for environmental assessment, generic terms of reference for biodiversity specialist studies in EIAs, a decision-making framework to guide trade-offs where these are unavoidable, and a policy framework for biodiversity offsets have been developed and are being applied nationally. |
| 1.3.1 <i>Ecosystem-specific guidelines for environmental assessment, and generic terms of reference for biodiversity specialist studies conducted as part of EtAs.</i> | |
| 1.3.2 <i>Framework for guiding trade-offs that decision-makers have to make.</i> | |
| 1.3.3 <i>Policy framework for biodiversity offsets</i> | |
| SO 3: Integrated management of terrestrial and aquatic ecosystems | |
| 3.8 Develop and implement effective measures for the management and control of activities relating to GMOs, in order to manage their impact on the | Environmental Management System for GMOs has been developed and is routinely used. |

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| environment. (4.3.8, P 37). | |
| SO 4: Sustainable use of biological resources and equitable sharing of the benefits | Lead agencies |
| 4.3 Develop the natural products sector (4.4.3, p 43). | <ul style="list-style-type: none"> • Facilitate international trade. • Facilitate certification. • Grow domestic demand through increased awareness. • Strengthen natural products enterprises and supply chain management. |

1.8 Department of Science and Technology

| Priority Actions per Strategic objective | 2012 TARGETS |
|--|---|
| SO 2: Enhanced institutional effectiveness and efficiency ensures good governance in the biodiversity sector | |
| 2.3 Establish a national biodiversity research strategy (4.2.3, p28) | National biodiversity research strategy is developed, recognised by all key stakeholders, and is guiding allocation of research efforts and funding. |
| SO 3: Integrated management of terrestrial and aquatic ecosystems | |
| 3.8 Develop and implement effective measures for the management and control of activities relating to GMOs, in order to manage their impact on the environment. (4.3.8, p 37). | Environmental Management System for GMOs has been developed and is routinely used. |
| SO 4: Sustainable use of biological resources and equitable sharing of the benefits | Lead agencies |
| 4.3 Develop the natural products sector (4.4.3, p 43). | <ul style="list-style-type: none"> • Facilitate international trade. • Facilitate certification. • Grow domestic demand through increased awareness. • Strengthen natural products enterprises and supply chain management. |

1.9 National Treasury

| Priority Actions per Strategic objective | 2012 TARGETS |
|--|--|
| SO 1: Enabling policy and legislative framework | |
| 1.2 Integrate biodiversity considerations into fiscal policy (4.1.2, p23) | At least two fiscal instruments and/or market mechanisms for biodiversity conservation are developed, and pilots are underway. |
| 1.2.1 <i>Fiscal instruments that encourage private landowners to contribute their own resources to effective biodiversity management</i> | |

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| 1.2.2 | <i>Mechanisms that allow for payment for ecosystem services, and reinvestment of the revenues generated in securing the health ecosystems</i> |
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1.10 Provincial conservation authorities and environment affairs departments

| Priority Actions per Strategic objective | | 2012 TARGETS |
|---|--|---|
| SO 1: Enabling policy and legislative framework | | |
| 1.3 Integrate biodiversity considerations into trade policy by developing tools for supporting and streamlining environmental decision-making (4.1.3, p24) | | Ecosystem guidelines for environmental assessment, generic terms of reference for biodiversity specialist studies in EIAs, a decision-making framework to guide trade-offs where these are unavoidable, and a policy framework for biodiversity offsets have been developed and are being applied nationally. |
| 1.3.1 | <i>Ecosystem-specific guidelines for environmental assessment, and generic terms of reference for biodiversity specialist studies conducted as part of EIAs.</i> | |
| 1.3.2 | <i>Framework for guiding trade-offs that decision-makers have to make.</i> | |
| 1.3.3 | <i>Policy framework for biodiversity offsets</i> | |
| SO 2: Enhanced institutional effectiveness and efficiency | | |
| 2.1 Establish a capacity building programme within the biodiversity sector to address transformation (4.2.1, p24). | | National biodiversity conservation capacity building programme, reflecting specific employment equity targets for all key research and implementing agencies in the biodiversity sector, is developed and underway. |
| 2.4 Establish a national monitoring, evaluation and reporting framework for biodiversity (4.2.5, p26). | | National biodiversity monitoring and reporting framework is established and being used as the basis for annual reports to parliament and is informing policy direction and implementation. Monitoring and evaluation frameworks for provincial conservation authorities and bioregional programmes feed into the national monitoring and reporting framework. |
| 2.5 Establish a national programme to build the capacity of local government to include biodiversity opportunities and constraints in integrated development planning and other municipal functions (4.2.5, p27). | | A national programme to build municipal capacity has been established and is underway, focusing initially on municipalities with, for example, high numbers of threatened ecosystems. |
| 2.6 Establish pilot projects to explore mechanisms for integrated natural resource management at the district and local level (4.2.6, p28) | | Pilots for district natural resource co-ordinators and/or other mechanisms for integrated natural resource management are underway in at least four districts. |
| SO 3: Integrated management of terrestrial and aquatic ecosystems | | |
| 3.1 Develop provincial spatial biodiversity plans (4.3.1, p30). | | At least six provinces have spatial provincial biodiversity plans in place, with the necessary in-house capacity to maintain and update them. |
| 3.2 Publish bioregional plans in terms of the Biodiversity Act (4.3.2, p 31). | | At least 7 bioregional plans have been published and are being used routinely to inform land-use planning and decision-making |

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| 3.3 List threatened and protected ecosystems in terms of the Biodiversity Act (4.3.3, p 31). | Threatened or protected ecosystems have been identified and listed, and the list has been updated at least once. Appropriate supporting material is available, and listed ecosystems are routinely taken into account in land-use planning and decision-making. |
| 3.4 Work with key production sectors to minimise loss and degradation of natural habitat in critical biodiversity areas (4.3.4, P 32). | <ul style="list-style-type: none"> Guidelines for biodiversity-friendly production of biofuels have been developed and are being applied by biofuel producers. An "eco red meat" certification system has been developed. At least three other production sectors have developed wise practice guidelines to minimise their impact on biodiversity. |
| 3.5 Implement the IAS regulations, and monitor implementation. (4.3.5, p 34) | <ul style="list-style-type: none"> Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species. System to monitor implementation in place |
| 3.6 Implementation of cross-sector policy objectives for the conservation of inland water biodiversity (4.3.6, p 35) | A portfolio of inland water conservation areas has been identified, and mechanisms for implementing appropriate management of these areas are being piloted in at least three Water Management Areas. |
| SO 4: Sustainable use of biological resources and equitable sharing of the benefits | |
| 4.1 Address illegal and unregulated fishing and seafood trade, especially of endemic line fish and abalone (Coastal provinces - 4.4.1, P 42) | Linefish status reports are updated, recovery plans are implemented for 6 species and the ecosystem approach is implemented in all major commercial fisheries |
| SO 5: Expanded network of conservation areas | |
| 5.1 Finalise the 20-year protected area expansion plan, underpinned by the national biodiversity targets in the NSBA for biomes, provinces and marine biozones (4.5.1, p 47). | <ul style="list-style-type: none"> Protected area expansion strategy finalised and supported by all key implementing agencies. Complete, up-to-date map of protected areas widely available Protected area register fully populated. |
| 5.2 Implement Phase 1 of 20-year protected area expansion plan (4.5.2, p 47). | 80/0 of terrestrial area and 200/0 of marine area is included in protected area network |
| 5.3 Establish and strengthen stewardship programmes in at least five provinces (4.5.3, p 48). | At least 5 provinces have active stewardship programmes. |

1.11 Bioregional programme co-ordination units

| Priority Actions per Strategic objective | 2012 TARGETS |
|---|---|
| SO 1: Enabling policy and legislative framework | |
| 1.1 Make the case for the value of biodiversity (4.1.1, p 23) | Partial economic valuation of South Africa's biodiversity is completed, and has been presented effectively to key decision-makers and the public. |

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| 1.2 Integrate biodiversity considerations into fiscal policy (4.1.2, p23) | |
| 1.2.1 Fiscal instruments that encourage private landowners to contribute their own resources to effective biodiversity management | |
| 1.2.2 Mechanisms that allow for payment for ecosystem services, and reinvestment of the revenues generated in securing the health ecosystems | |
| SO 2: Enhanced institutional effectiveness and efficiency | |
| 2.4 Establish a national monitoring, evaluation and reporting framework for biodiversity (4.2.5, p26). | National biodiversity monitoring and reporting framework is established and being used as the basis for annual reports to parliament and is informing policy direction and implementation. Monitoring and evaluation frameworks for provincial conservation authorities and bioregional programmes feed into the national monitoring and reporting framework. |
| 2.5 Establish a national programme to build the capacity of local government to include biodiversity opportunities and constraints in integrated development planning and other municipal functions (4.2.5, p27). | A national programme to build municipal capacity has been established and is underway, focusing initially on municipalities with, for example, high numbers of threatened ecosystems. |
| 2.6 Establish pilot projects to explore mechanisms for integrated natural resource management at the district and local level (4.2.6, p28) | Pilots for district natural resource co-ordinators and/or other mechanisms for integrated natural resource management are underway in at least four districts. |
| 2.7 Support the development and strengthening of bioregional programmes (4.2.7, P 28). | The co-ordination units of the five existing bioregional programmes (C.A.P.E., SKEP, STEP, Grasslands and Wild Coast) are funded by government and effective management structures have been established. At least two new bioregional programmes have been established (marine, freshwater). |
| SO 3: Integrated management of terrestrial and aquatic ecosystems | |
| 3.4 Work with key production sectors to minimise loss and degradation of natural habitat in critical biodiversity areas (4.3.4, p 32). | <ul style="list-style-type: none"> Guidelines for biodiversity-friendly production of biofuels have been developed and are being applied by biofuel producers. An "eco red meat" certification system has been developed. At least three other production sectors have developed wise practice guidelines to minimise their impact on biodiversity. |
| 3.5 Implement the IAS regulations, and monitor implementation. (4.3.5, p 34) | <ul style="list-style-type: none"> Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species. System to monitor implementation in place |

1.12 Local government, SALGA and DPLG

| Priority Actions per Strategic objective | 2012 TARGETS |
|---|--------------|
| SO 2: Enhanced institutional effectiveness and efficiency | |

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| 2.5 Establish a national programme to build the capacity of local government to include biodiversity opportunities and constraints in integrated development planning and other municipal functions (4.2.5, p27). | A national programme to build municipal capacity has been established and is underway, focusing initially on municipalities with, for example, high numbers of threatened ecosystems. |
| 2.6 Establish pilot projects to explore mechanisms for integrated natural resource management at the district and local level (4.2.6, p28) | Pilots for district natural resource co-ordinators and/or other mechanisms for integrated natural resource management are underway in at least four districts. |
| SO 3: Integrated management of terrestrial and aquatic ecosystems | |
| 3.5 Implement the IAS regulations, and monitor implementation. (4.3.5, p 34) | <ul style="list-style-type: none"> • Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species. • System to monitor implementation in place |

1n13 NGOs

| Priority Actions per Strategic objective | 2012 TARGETS |
|--|---|
| SO 4: Sustainable use of biological resources and equitable sharing of the benefits | |
| 4.1 Address illegal and unregulated fishing and seafood trade, especially of endemic line fish and abalone (WWF & SASSI - 4.4.1, P 42) | Linefish status reports are updated, recovery plans are implemented for 6 species and the ecosystem approach is implemented in all major commercial fisheries. |
| 4.3 Develop the natural products sector (4.4.3, p 43). | <ul style="list-style-type: none"> • Facilitate international trade. • Facilitate certification. • Grow domestic demand through increased awareness. • Strengthen natural products enterprises and supply chain management. |
| SO 5: Expanded network of conservation areas | |
| 5.3 Establish and strengthen stewardship programmes in at least five provinces (4.5.3, p 48). | At least 5 provinces have active stewardship programmes. |

1.14 Research institutions and tertiary education institutions

| Priority Actions per Strategic objective | 2012 TARGETS |
|--|---|
| SO 2: Enhanced institutional effectiveness and efficiency | |
| 2.1 Establish a capacity building programme within the biodiversity sector to address transformation (4.2.1, p27). | National biodiversity conservation capacity building programme, reflecting specific employment equity targets for all key research and implementing agencies in the biodiversity sector, is developed and underway. |

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| 2.3 Establish a national biodiversity research strategy (WRC, NRF - 4.2.3, p26) | National biodiversity research strategy is developed, recognised by all key stakeholders, and is guiding allocation of research efforts and funding. |
| SO 4: Sustainable use of biological resources and equitable sharing of the benefits | |
| 4.3 Develop the natural products sector (4.4.3, p 43). | <ul style="list-style-type: none"> • Facilitate international trade. • Facilitate certification. • Grow domestic demand through increased awareness. • Strengthen natural products enterprises and supply chain management. |
| 4.4 Improve knowledge of sustainable extractive use of terrestrial resources (4.4.4, p 46) | Knowledge of the extent of harvesting and limits to sustainable extractive use of at least ten medicinal plants is developed, and species management plans have been developed for at least five medicinal plants in collaboration with user groups. |

1 Introduction to the NBF

The National Biodiversity Framework (NBF) is required in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (hereafter referred to as the Biodiversity Act).

This introduction to the NSF explains:

- the purpose of the NSF (including what the NBF is not)
- its intended users
- the relationship between the NBF, the National Biodiversity Strategy and Action Plan (NBSAP), and the National Spatial Biodiversity Assessment (NSBA)

1.1 What is the purpose of the NSF

The NBF provides a framework for conservation *and* development. Too often in South Africa conservation and development are seen as opposing or irreconcilable goals. As our economy reaches 6% economic growth, it is important to understand that sustainable development depends on *where* and *how* development takes place.

Development is not sustainable if it results in:

- loss and degradation of habitat in threatened ecosystems and critical biodiversity areas
- further introduction or spread of invasive alien species
- over-abstraction of water beyond the limits of the ecological reserve
- over-harvesting of species
- climate change

There are many opportunities for development that is consistent with building on and maintaining our extraordinary natural resource base, so that the socio-economic options of future generations are not compromised.

We are fortunate in South Africa to have an excellent base of biodiversity science that can provide tools for streamlining environmental decision-making and ensuring that development is appropriately located and managed. The NBF hopes to contribute to making such tools accessible and useful to a range of socio-economic sectors.

Sustainable use and conservation of biodiversity is a multi-sectoral effort that requires co-ordination and alignment of the efforts of many different organisations and individuals, inside and outside government.

The NBF sets out a framework for achieving this co-ordination and alignment. It does this by:

- highlighting the major pressures on biodiversity in South Africa
- identifying priority actions for the next five years for conserving biodiversity (these are a subset of the actions identified in the twenty-year National Biodiversity Strategy and Action Plan)
- setting out the implications of these priority actions for agencies that will lead their implementation

According to the Biodiversity Act, the NBF must be reviewed at least every five years, providing an opportunity to take stock of progress, review priorities, and realign efforts. The NBF is thus a short- to medium-term tool. Its aim is not to be comprehensive, but rather to focus collective attention and effort on the set of activities that will make the most difference.

According to the Biodiversity Act, the NBF must:

- Provide for integrated, co-ordinated and uniform approach to biodiversity management
- Identify priority areas for conservation action
- Identify priority areas for establishment of protected areas
- Reflect regional co-operation issues concerning biodiversity management in southern Africa

In addition, the NBF aims to:

- Focus attention on the most urgent strategies and actions required for biodiversity management
- Point to roles and responsibilities of key stakeholders, including key organs of state whose mandates impact directly on biodiversity management

The purpose of the NSF is *not* to:

- Describe South Africa's biodiversity and its importance in detail
- Reiterate South Africa's commitments to conserving biodiversity as a signatory of the Convention on Biodiversity
- Describe the policy and legislative framework for biodiversity conservation in South Africa
- Give a comprehensive list of all actions required to conserve and manage South Africa's biodiversity

For more on these topics see the following documents:

- The National Biodiversity Strategy and Action Plan (NBSAP) Country Study (DEAT 2005a)
- The NBSAP (DEAT 2005b)
- The National Spatial Biodiversity Assessment (NSBA) (Driver et al, 2005)
- The Biodiversity of South Africa 2002: Indicators, trends and human impacts (Endangered Wildlife Trust 2002)

1.2 Who should use the NSF

This section points to the *key intended users* of the NBF, without whose collaboration effective conservation and sustainable use of South Africa's biodiversity will not be possible. The list of users of the NSF in this section is not comprehensive - there are likely to be additional users not mentioned here.

The intended users of the NBF include the following groups, each of which is expanded on below:

1. Organs of state whose core business includes biodiversity conservation
 2. Organs of state whose core business is not biodiversity conservation, but whose policies, programmes and decisions impact directly and substantially on how biodiversity is managed
 3. Government-led programmes
 4. NGOs wishing to make a contribution to biodiversity conservation in South Africa
 5. The private sector, particularly those production sectors whose activities contribute to the major pressures on South Africa's biodiversity, such as loss of natural habitat, over-abstraction of freshwater resources, and over-harvesting of marine resources
 6. Bioregional programmes, which are multi-sectoral, multi-institutional, landscape-wide conservation initiatives at the regional level
-
1. Organs of state whose core business includes biodiversity conservation include:
 - Department of Environmental Affairs and Tourism (DEAT)
 - South African National Biodiversity Institute (SANSI)
 - South African National Parks (SANParks)
 - Provincial conservation authorities

Provincial conservation authorities include:

- Conservation agencies or parks boards:
 - CapeNature (Western Cape)
 - Eastern Cape Parks Board (ECPB)
 - Ezemvelo KwaZulu-Natal Wildlife (EKZNW)
 - Mpumalanga Tourism and Parks Agency (MTPA)
 - North West Parks and Tourism Board (NWPTB)
 - Limpopo Tourism and Parks Board (LTPB)

Of these six, CapeNature and EKZNW have a mandate to work throughout the province concerned, inside and outside protected areas. The other four have a mandate to work only within protected areas.

- Provincial environment affairs and/or conservation departments:
 - Eastern Cape Department of Economic Affairs, Environment and Tourism (DEAET)
 - Free State Department of Tourism, Economic and Environment Affairs (DTEEA)
 - Gauteng Department of Agriculture, Conservation and Environment (GDACE)
 - KwaZulu-Natal Department of Agriculture and Environment Affairs (DAEA)
 - Limpopo Department of Economic Development, Environment and Tourism (DEDET)
 - Mpumalanga Department of Agriculture and Land Administration (DALA)
 - North West Department of Agriculture, Conservation and Environment (NWDACE)
 - Northern Cape Department of Tourism, Environment and Conservation (DTEC)
 - Western Cape Department of Environment Affairs and Development Planning (DEA&DP)

2. Organs of state whose core business is not biodiversity conservation, but whose policies, programmes and decisions impact directly and substantially on how South Africa's biodiversity is managed, include:

- National Department of Agriculture (DoA)
- Provincial departments of agriculture
- Department of Water Affairs and Forestry (DWAF)
- Department of Minerals and Energy (DME)
- Department of Land Affairs (DLA)
- Department of Public Works (DPW)
- Municipalities

These organs of state play a key role in managing natural resources, and are required to take biodiversity into account in terms of the Constitution and NEMA.

In addition, following national departments, while not directly responsible for managing natural resources, play a role in establishing policy and implementation frameworks that impact on biodiversity conservation:

- The Presidency
- Department of Provincial and Local Government (DPLG)
- Department of Science and Technology (DST)
- Department of Trade and Industry (DTI)
- National Treasury

The local sphere of government deserves particular mention. Day-to-day decisions about how land and other natural resources are used at the local level ultimately determine whether development is sustainable. While local government does not make all these decisions itself (many of them are made by provincial or national departments, or by individual landowners or resource users), it has a key role to play in ensuring co-ordination and integrated management of natural resources. The South African Local Government Association (SALGA) has an important role to play in building the capacity of local government to do this.

3. Government-led programmes include:

- Working for Water
- Working for Wetlands
- Working on Fire
- LandCare
- CoastCare
- Community Based Natural Resource Management

4. Major NGOs in the conservation sector include:

The biodiversity sector in South Africa includes a range of international, national and local NGOs that make significant contributions to achieving the objectives of the NBSAP, including through mobilising civil society involvement in the conservation and sustainable use of biodiversity and through fundraising.

Examples of national NGOs in the biodiversity sector include:

- Birdlife South Africa
 - Botanical Society of South Africa, including its Conservation Unit based in Cape Town
 - Endangered Wildlife Trust (EWT)
 - IUCN (World Conservation Union) South Africa
 - Wildlife and Environment Society of South Africa (WESSA)
 - WWF-SA (World Wide Fund for Nature South Africa)
5. Production sectors whose activities contribute substantially to the major pressures on South Africa's biodiversity, and which thus have an important role to play in contributing positively to biodiversity conservation, include, amongst others:
- Cultivation, including biofuels
 - Forestry
 - Mining
 - Commercial fishing
 - Property development, especially coastal property development
 - Energy production
 - Construction and infrastructure development
6. Production sectors whose activities can be compatible with biodiversity management objectives, include, amongst others:
- Livestock and game farming
 - Wildlife tourism and hunting
7. Bioregional programmes are multi-sectoral, multi-institutional, landscape-wide conservation initiatives at the regional level. They include:
- Cape Action for People and the Environment (C.A.P.E.)
 - Succulent Karoo Ecosystem Programme (SKEP)
 - Subtropical Thicket Ecosystem Programme (STEP)
 - Grasslands Programme
 - Wild Coast Conservation and Sustainable Development Programme

These bioregional programmes have co-ordination units or programme management units that *facilitate co-ordination and collaboration* between many of the organisations and

institutions listed in the previous four categories. They have a key role to play in realising the goals of the NBF in their particular regional contexts.

1.3 Relationship between the NBF, the NBSAP and the NSBA

The NSF rests on two preceding documents, both of which were based on extensive stakeholder consultation: the National Biodiversity Strategy and Action Plan (NBSAP) and the National Spatial Biodiversity Assessment (NSBA).

1.3.1 Overview of the NBSAP

The NBSAP sets out a comprehensive long-term strategy for the conservation and sustainable use of South Africa's biodiversity, including medium- and long-term targets. It was finalised in May 2005, after a two-year development process. The NBSAP is a twenty-year strategy, developed as part of South Africa's commitments to the Convention on Biological Diversity (CBD).

The overall goal of the NBSAP is:

- To conserve and manage terrestrial and aquatic biodiversity to ensure sustainable and equitable benefits to the people of South Africa, now and in the future

The NBSAP identifies five strategic objectives (SOs) that are required to achieve this goal:

- SO 1: An enabling policy and legislative framework integrates biodiversity management objectives into the economy
- SO 2: Enhanced institutional effectiveness and efficiency ensures good governance in the biodiversity sector
- SO 3: Integrated terrestrial and aquatic management minimizes the impacts of threatening processes on biodiversity, enhances ecosystem services and improves social and economic security
- SO 4: Human development and well-being is enhanced through sustainable use of biological resources and equitable sharing of the benefits
- SO 5: A network of conservation areas conserves a representative sample of biodiversity and maintains key ecological processes across the landscape and seascape

For each of these strategic objectives, the NBSAP identifies outcomes, activities, targets and indicators.

1.3.2 Overview of the NSBA

The NSBA provides a spatial picture of the location of South Africa's threatened and under-protected ecosystems, and focuses attention on geographic priority areas for biodiversity conservation. South Africa's first NSBA was undertaken in 2004, and published in April 2005. The NSBA will be updated every five years, in time to feed into the review of the NBF.

The NSBA is based on the systematic approach to biodiversity planning, which is driven by two principles:

- The principle of representation, or the need to conserve a *representative sample of biodiversity pattern*, including ecosystems, habitats and species
- The principle of persistence, or need to conserve *ecological and evolutionary processes* that allow biodiversity to persist over time

The NSBA 2004 found that 82% of South Africa's main river ecosystems are threatened compared with 34% of our terrestrial ecosystems, highlighting the fact that South Africa is a water-scarce country in which freshwater ecosystems are under great pressure.

Our protected area network is biased towards particular ecosystems and species. It does not conserve a representative sample of biodiversity, and excludes key ecological processes. This means that appropriate management of land and natural resources outside protected areas, especially in threatened ecosystems, is crucial for conserving biodiversity.

1.3.3 How the NSF fits in

The NBF is informed by both the NBSAP and the NSBA. It draws together key elements of each, and focuses attention on the immediate priorities, both spatial and thematic, for the next five years.

1.3.4 Relationship between the NBF and other national policies and strategies

ASGISA

As the South African economy reaches the 6% growth rate targeted by national economic policy, the prospect of achieving major social goals such as halving poverty and

unemployment by 2014 becomes real. A sustained 6% growth rate also means that the size of the economy will double approximately every 11 years, with major implications for the use of natural resources, especially water and natural habitat. We need to ensure that the way we achieve 6% growth allows for the continued functioning of ecosystems and the persistence of the natural resource base. This is possible, if care is taken over the location of development and the consumption of natural resources in the development process.

Sustainable development means avoiding development that results in:

- loss and degradation of natural habitat in threatened ecosystems or critical biodiversity areas
- further introduction or spread of invasive alien species
- over-abstraction of water beyond the limits of the ecological reserve
- over-harvesting of species
- climate change

The NSBA, together with finer scale biodiversity plans for various parts of the country, points to ecosystems and locations where particular caution is needed before decisions are made to destroy or disturb natural habitat. Published bioregional plans in terms of the Biodiversity Act, based on systematic biodiversity plans, will provide a mechanism for streamlining environmental decision-making, contributing directly to achieving one of the objectives of ASGISA by reducing the regulatory hurdles to development, *and* helping to ensure that 6% growth does not compromise our natural resource base.

The NSF highlights the need to use spatial biodiversity plans to streamline environmental decision-making, and to develop the ability of the ecotourism sector and the natural products sector to contribute directly to job-creating growth.

NFSD

South Africa's National Framework for Sustainable Development (NFSD) highlights the need for maintaining the health and integrity of terrestrial and aquatic ecosystems as an underpinning of sustainable development. Strategic interventions for biodiversity conservation identified in the NFSD are consistent with those identified in the NSF. The NSF provides more detail than the NFSD, in which biodiversity was one of many priorities addressed.

The NFSD highlights the following opportunities and key challenges for sustainable development with respect to biodiversity:

- | | Reflected in NSF |
|--|---|
| • Making the case for the value of biodiversity | Priority Action 4.1.1, P 21 |
| • Minimising loss and degradation of natural habitat, especially in threatened ecosystems | Priority Action 4.3.4, p 32 |
| • Preventing and controlling impacts of invasive alien species | Priority Action 4.1.4, p23 Priority Action 4.3.5, p34 |
| • Making sure that extractive use of our natural resources is sustainable, especially in marine environment | Priority Action 4.4.1, P 42 Priority Action 4.4.4, p46 |
| • Building the capacity of local government to include biodiversity opportunities and constraints in integrated development planning and other municipal functions | Priority Action 4.2.5 p 27 |
| • Unlocking a mechanism for integrated natural resources management at local level | Priority Action 4.2.6, p 28 |
| • Expanding the protected area network through innovative mechanisms | Priority Action 4.5.1, p 47, to 4.5.4, P 49 |

Each of these opportunities and challenges is reflected in one of more of the priority actions discussed in Section 4.

NSDP

The National Spatial Development Perspective (NSDP) establishes principles for the spatial location and alignment of infrastructure investment in South Africa, in order to maximise the impact of scarce resources. It is designed to act as an indicative planning tool for all spheres of government with emphasis on the spatial implications for infrastructure and development policy and programmes in all three tiers of government.

The principles of the NSDP are consistent with biodiversity conservation objectives, especially to the extent that they encourage compact, nodal urban development and discourage investment in fixed infrastructure in marginal areas of limited economic potential.

Direct links between the NSF and the NSDP are limited, but no direct conflicts between the two are evident. The set of maps included in the NSDP includes a map of environmentally sensitive areas.

1.4 Structure of the NSF

The NBF is structured as follows:

- Section 1 has introduced the NSF, including its purpose, intended users, and relationship to the NBSAP and the NSBA
- Section 2 summarises why South Africa's biodiversity is important
- Section 3 briefly discusses the major pressures on South Africa's biodiversity
- Section 4 is the heart of the NBF: it outlines the priority strategies and actions for conserving South Africa's biodiversity, drawing directly on the NBSAP and the NSBA
- Section 5 spells out the implications of these priority strategies and actions for lead implementing agencies
- Section 6 outlines additional mechanisms for implementing the Biodiversity Act, over and above the NSF
- Section 7 discusses the monitoring and review process envisaged for the NSF

2 Why South Africa's Biodiversity Matters

It is well known and well documented that South Africa's biodiversity is globally unique (see for example, DEAT 2005a). Perhaps less recognised and appreciated in the socio-economic importance of our country's biodiversity resources.

South Africa's biodiversity provides an important basis for economic growth and development, in obvious ways such as providing a basis for our fishing industry, rangelands that support commercial and subsistence farming, horticultural and agricultural industry based on indigenous species, our tourism industry, aspects of our film industry, and commercial and non-commercial medicinal applications of indigenous resources. Keeping our biodiversity intact is also vital for ensuring ongoing provision of ecosystem services such as production of clean water through good catchment management, prevention of erosion, carbon storage (to counteract climate change) and clean air. Loss of biodiversity puts aspects of our economy and quality of life at risk, and reduces socio-economic options for future generations

People are ultimately fully dependent on living, functional ecosystems and their services they provide. The rural poor are more directly affected - poor people have limited assets and are more dependent on common property resources for their livelihoods, whilst the wealthy are buffered against loss of ecosystem services by being able to purchase basic necessities and scarce commodities. Our path towards sustainable development, poverty reduction and enhanced human well-being is therefore dependent on how effectively we conserve biodiversity.

Natural assets in most instances are harvested as part of an informal or second economy or cannot be traded. The benefits of South Africa's biodiversity stock and the flow of goods and services it generates therefore generally do not accrue through the market system and therefore does not generate sufficient private investment and institutions for its conservation and restoration. It also has limited potential for commercialisation. However, the social impacts and economic costs of not managing ecosystems in a sustainable manner is high, as is demonstrated through land degradation, loss of ecosystem resilience, loss of freshwater resources, the intensification of the global carbon cycle and resulting climate change, the loss of fishing stock and the deterioration of air quality. Based on several South African case studies, the average rural person that has open access to mostly communal lands derived a largely unaccounted value of R8DO -

R1 000 per person per annum from wild products and ecosystem grazing services to support their livestock. That is an average value of R6 000 per household per annum.

For the whole of South Africa, the added value of ecosystems in the production of biological resources as well as the final consumption of ecosystems was recently conservatively estimated at a baseline reference value of R27 billion per annum, or R20000 per terrestrial krrr', with a spread of around R30 000/km² for savannas and grasslands to R5 500/km² for the Karoo. Indirect use values (mostly notably grazing and pollination inputs) account for two thirds of this value, while direct consumptive use values (nature's share of timber resources, aquatic resources, crops and plant resources and animal resources) account for 28% and non-consumptive use (nature based tourism) for 6% of total value.

Even if values are assumed unrealistically low, biodiversity still plays a significant role in the South African economy. If it is assumed that under an arbitrarily 10% scenario where:

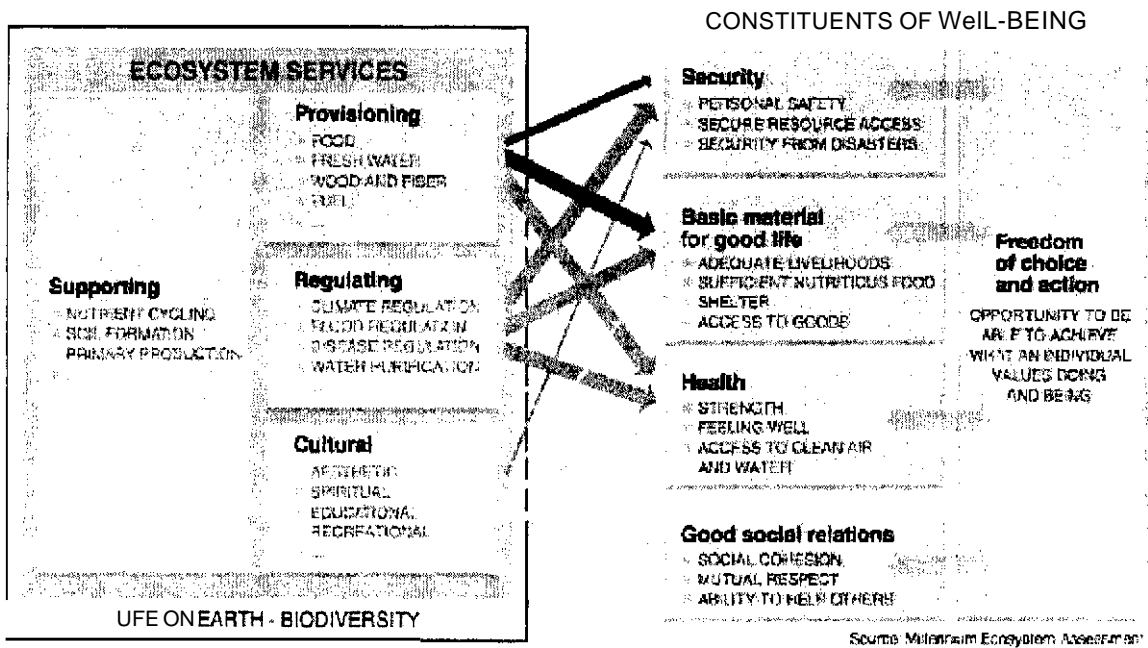
- only 10% of the value of nature-based tourism is directly dependent on the ecosystems
- pollination services are only 10% of the value measured in the fynbos biome
- value of the sequestered carbon is only R6,50/ton CO₂.

The added value of ecosystems in the production of biological resources as well as the final consumption of ecosystems is still estimated at a value more than R10 billion/annum.

It is therefore obvious that economic valuation of biodiversity is needed and can help in better informing decision-making processes. If the economic value of biodiversity is not included in decision making processes, sustainable development will not be achieved. With ecosystems that provide a list of goods and services that play an important role in formal economic activities, as well as contributing in a substantial way to the rural poor, it is imperative to have an estimate on the extent of these economic values and a way to communicate this message to decision makers in fields such as public and private finance, socio-economic development, industrial policy, fiscal policy, environmental protection and restoration, and poverty alleviation.

The linkages between ecosystem services and human well-being, as identified by the Millennium Ecosystem Assessment, are depicted in the diagram below:

Linkages between ecosystem services and human well-being



ARROW'S COLOR
Potential for mediation by socioeconomic factors

ARROW'S WIDTH
Intensity of linkages between ecosystem services and human well-being

Weak

Medium

High

Weak

Medium

Strong

Figure SDM - A - The MA framework

Source: Millennium Ecosystem Assessment

3. Major Pressures on South Africa's Biodiversity

Many people are not aware of the impact of ordinary day-to-day activities on the functioning of ecosystems, and often see biodiversity conservation as being about protecting individual rare or threatened species rather than maintaining the integrity of ecosystems on which we depend for survival.

The major pressures on South Africa's biodiversity are:

- loss and degradation of natural habitat, in terrestrial and aquatic ecosystems
- invasive alien species
- over-harvesting of species, especially in the marine environment
- over-abstraction of water
- climate change

Each of these is briefly explained below.

There are of course many other pressures on biodiversity, but these ones account for the majority of the damage to ecosystems, and are thus the most urgent ones to address.

3.1 Loss and degradation of natural habitat

Loss of natural habitat occurs when natural ecosystems are disturbed to the extent that they cannot recover. This occurs especially through:

- Cultivation
- Afforestation
- Mining
- Urban sprawl
- Ribbon development along the coast
- Trawl fisheries (that damage the ocean bed)

Loss of natural habitat, and the fragmentation of the remaining habitat that goes with it, is the single biggest cause of biodiversity loss in South Africa. In almost all cases it is irreversible.

Degradation of natural habitat occurs when natural ecosystems are disturbed, but not so much that they cannot recover. Overgrazing is the major cause of degradation. Some

ecosystems recover more easily from overgrazing than others. Generally, the more arid the ecosystem the longer it takes to recover.

Loss and degradation of natural habitat affect both terrestrial and aquatic ecosystems. For example, when riparian habitat (river banks) and wetlands are disturbed, not only is the terrestrial habitat itself affected, but the health of the river, wetland system and estuary is compromised.

Pollution causes degradation and in some cases outright loss of natural habitat, especially in aquatic environments. Examples include oil spills in marine and coastal environments, and point-source industrial and agricultural pollution into rivers and wetlands, and agricultural pesticides that impact on pollinators and ecosystem functioning.

Not *all* loss of natural habitat is a problem. It is crucial to avoid loss and degradation of natural habitat in critical biodiversity areas. Critical biodiversity areas include:

- Critically endangered ecosystems
- Endangered ecosystems
- Ecological corridors
- River corridors
- Wetlands and estuaries
- Special habitats

Bioregional plans published in terms of the Biodiversity Act will identify critical biodiversity areas on a map, and will provide guidelines for land-use planning and decision-making in these critical biodiversity areas.

3.2 Invasive alien species

Invasive alien species, both plants and animals, are a major problem in terrestrial, freshwater and marine environments. They displace indigenous species, disturb habitats, and disrupt ecosystem functioning.

The problem is two-fold:

- It is difficult to manage and control invasive alien species that are already present in South Africa
- It is difficult to prevent entry of new invasive alien species

In the terrestrial environment, the major invasive alien species are woody plants. In addition to disrupting terrestrial ecosystem functioning, they use much more water than indigenous woody plants, and therefore disrupt freshwater ecosystems as well, especially when they occur in riparian zones (along river banks).

In the freshwater environment, the major invasive alien species are fish, such as bass, which predate indigenous fish and damage habitats.

In the marine environment, major invasive alien species include the blue mussel, which cannot be eradicated, and the European shore crab which can and should be eradicated. The mariculture industry, if not carefully managed, could result in new invasive alien species problems in the marine environment.

The Invasive Alien Species regulations that will be published in terms of the Biodiversity Act cater for a range of measures to address the problems associated with invasive alien species.

3.3 Over-abstraction of freshwater

Freshwater ecosystems in South Africa are under even more pressure than terrestrial ecosystems, reflecting the fact that we are a water-scarce country. According to the NBSA, 440/0 of our main river ecosystems were critically endangered in 2004, compared with 5% of terrestrial ecosystems.

Freshwater ecosystems include rivers, wetlands and groundwater. The biggest pressure on freshwater ecosystems is flow modification, which occurs as a result of building dams and weirs, extracting water, and changing the course of a river.

The next biggest pressures on freshwater ecosystems are loss of natural habitat in the riparian zone and further away in the catchment, and invasive alien species in the riparian zone and in the river.

All of these pressures in freshwater ecosystems apply equally to estuaries, and can also impact on near-shore marine habitats.

The National Water Act provides for an ecological reserve - an amount of water that "belongs" to the river and is needed to maintain its ecological functioning. However, the

implementation of the ecological reserve is complex, especially in cases where it involves retracting existing water rights. Catchment Management Agencies, currently being established by DWAF, will play a major role in rolling out the implementation and enforcement of the ecological reserve.

3.4 Over-harvesting of marine species

Over-harvesting occurs in some terrestrial ecosystems (for example, over-harvesting of some medicinal species), but is not a major issue compared with loss of natural habitat and invasive alien species. However, *in the marine environment, over-harvesting of marine living resources is by far the single biggest pressure on biodiversity.*

We do not have current stock assessments for many of South Africa's important commercial marine species, so the full extent of the problem may not be appreciated. However, we do know that the stock status of eleven of our line fish species is considered collapsed. This means that less than 20% of the breeding stock remains, and the species is in danger of commercial extinction. These line fish species include ones that are still commonly served in restaurants all over the country, such as kob, certain rockcods and slinger.

Depletion of fish stocks themselves is not the only problem. Often commercial and recreational fishing results in by-catch and accidental death of other species such as seabirds and turtles, to the extent that they also become threatened.

3.5 Climate change

Global climate change, caused by increasing levels of greenhouse gasses in the atmosphere is widely accepted as fact. Although uncertainties may exist about the extent of the changes and the scope and depth of economic impacts, it is generally accepted that climatic changes are already underway, which are leading to ecological changes. Climate change is likely to impact on the economy and society at large. It is the poor and marginalized who are most likely to be exposed to these impacts, and least able to cope due to lack of access to both resources and social services.

The projected decline in South Africa's biodiversity that is noted in climate change assessment reports is especially worrying. Five major ecosystem processes that may be

affected through changes in biodiversity have been identified as community respiration, decomposition, nutrient retention, plant productivity and water retention. There is strong evidence that biodiversity, including the number, abundance and composition of genotypes, populations, species, functional units and landscape units, significantly influences the provision of ecosystem services and therefore human well being¹. The reduction in the number of species, especially rare species, may only have subtle effects on ecosystem services in the short term, but can compromise the capacity of ecosystems to adjust in the face of a changing climate. By affecting processes such as primary production, nutrient and water cycling, and soil formation and retention, biodiversity indirectly supports the production of food, potable water and other natural products. Fragmentation of habitats also affects carbon cycling processes and reduces carbon storage. Biodiversity conservation should be a key concern in South Africa's national climate change response strategy.

3.6 The challenge is how to conserve AND develop (vs conserve OR develop)

The challenge we face in addressing these pressures on biodiversity is not to conserve OR to develop, but rather how to conserve AND develop. It's all about *where* and *how* development takes place. The biodiversity sector is developing increasingly effective tools to support and streamline environmental decision-making and ensure that development is appropriate. Key among these are published bioregional plans in terms of the Biodiversity Act, which will identify critical biodiversity areas, including ecological corridors and important catchments, and give land-use planning and decision-making guidelines for these critical biodiversity areas.

Sustainable development is development that avoids:

- loss and degradation of habitat in threatened ecosystems and critical biodiversity areas
- further introduction or spread of invasive alien species
- over-abstraction of water beyond the limits of the ecological reserve
- over-harvesting of species
- contributing to climate change

¹ S Diaz and O Tilman (Lead authors) (2004) Millennium Ecosystem Assessment Condition and Trends Assessment. Chapter 12. Biodiversity regulation of ecosystem services.

4. Priority Actions for Conserving and Managing South Africa's Biodiversity

This section identifies priority actions for conserving and managing South Africa's biodiversity, and highlights spatial priorities for biodiversity conservation. As explained in Section 1.3, **the NBSAP is a twenty-year strategy** which identifies five strategic objectives and a comprehensive set of outcomes for each. **The NBF draws out immediate priorities for the next five years** within each of the Strategic Objectives (SOs) of the NBSAP. This section is organised according to the Strategic Objectives of the NBSAP.

South Africa has good policy and legislation for the wise use and management of biodiversity, notwithstanding some gaps (see S01 below). Much of it is relatively new. The **overall challenge for the next five years is to implement existing policy and legislation effectively.**

A theme that runs through many of the priority actions discussed below is **mainstreaming biodiversity**, which means integrating biodiversity considerations in the policies, strategies and day-to-day operations of a range of sectors whose core business is not biodiversity conservation. Mainstreaming biodiversity is essential for overcoming the "conservation vs. development" mindset, and for ensuring sustainable development.

4.1 SO 1: Enabling policy and legislative framework

Twenty-year objective: *An enabling policy and legislative framework integrates biodiversity management objectives into the economy.*

Top priority actions for 2007 to 2012:

- Make the case for the value of biodiversity as a cornerstone of sustainable development
- Integrate biodiversity considerations into fiscal policy
- Integrate biodiversity considerations in land-use planning and decision-making, by developing tools for supporting and streamlining environmental decision-making
- Develop a regulatory framework for the prevention, containment and eradication of invasive alien species (IAS)
- Develop a regulatory framework for access and benefit sharing (ASS)

4.1.1 Make the case for the value of biodiversity as a cornerstone of sustainable development

The biodiversity sector has not made an effective case for the role of biodiversity in sustainable development, and for the links between biodiversity and socio-economic development. There is an urgent need to make the case for biodiversity, and to disseminate it among decision-makers and the public, if we are to address the major causes of biodiversity loss discussed in Section 3.

This includes working with Statistics South Africa to further develop tools for valuing biodiversity and to reflect the value of biodiversity in South Africa's national resource accounts.

Lead agencies: DEAT, SANSI, bioregional programme co-ordination units

2012 target: Partial economic valuation of South Africa's biodiversity is completed, and has been presented effectively to key decision-makers and the public.

4.1.2 Integrate biodiversity considerations into fiscal policy

This involves developing fiscal instruments for improved biodiversity management, as part of the National Treasury's environmental fiscal reform initiative.

a. Fiscal instruments that encourage private landowners to contribute their own resources to effective biodiversity management

Most of South Africa's biodiversity is in private hands, and private landowners (individuals or companies) are often willing to contribute their own resources to maintaining biodiversity and ecosystem functioning on their land. Incentives such as income tax deductions for expenditure on controlling invasive alien species or on rehabilitating ecosystems, and estate duty provisions that encourage philanthropy towards the environment, would help to harness this pool of private resources, with benefits for the provision of ecosystem services that contribute to the public good.

b. Mechanisms that allow for payment for ecosystem services, and reinvestment of the revenues generated in securing the health of ecosystems

Some payment mechanisms for ecosystem services exist already, for example levies on water and charges for pollution discharge. It is important to ensure that the revenues thus generated are invested in maintaining the ecosystem services concerned, for example in improved catchment management.

Lead agencies: DEAT, SANSI, National Treasury, bioregional programmes

2012 target: At least two fiscal instruments and/or market mechanisms for biodiversity conservation are developed, and pilots are underway.

4.1.3 Integrate biodiversity considerations in land-use planning and decision-making, by developing tools for supporting and streamlining environmental decision-making

Our current system of environmental assessment and land-use decision-making usually fails to take adequate account of and respond to biodiversity priorities, with negative consequences for ecosystem functioning. This could be improved through the development of the following practical tools for officials, consultants and decision-makers. All of these tools rest on the identification and listing of threatened and protected ecosystems (see priority action 4.3.3 and/or the application of bioregional plans which identify critical biodiversity areas in which loss of natural habitat should be avoided (see priority actions 4.3.1 and 4.3.2).

a. *Ecosystem guidelines for environmental assessment, and generic terms of reference for biodiversity specialist studies conducted as part of EIAs.*

Biodiversity specialist studies in EIAs are often limited to listing species of special concern on the site. They usually fail to address impacts on ecosystem functioning, or cumulative impacts, yet these are crucial for sustainable development. Such guidelines and terms of reference have been published for the Western Cape, and should be produced for other provinces. These simple tools can dramatically improve the quality of biodiversity assessment in EIAs.

b. *Framework for guiding trade-offs that decision-makers have to make*

In many cases, conflicts between, for example, biodiversity management, food production and job creation, can be avoided through intelligent project planning and design. However, in some cases, trade-offs have to be made when a development application is approved or not approved. There is currently no framework to guide

decision-makers about how to weigh up biodiversity considerations against more immediate socio-economic considerations. The framework for trade-offs should take threatened ecosystems and critical biodiversity areas into account.

c. *Policy framework for biodiversity offsets*

In some cases, following avoidance and mitigation, there is still residual damage to biodiversity as a result of a development. In such cases, if the development is socially and economically sustainable, ecological sustainability may be achieved through a biodiversity offset. A biodiversity offset involves setting aside land in the same or a similar ecosystem elsewhere, at the cost of the developer. Biodiversity offsets are particularly important in threatened ecosystems and critical biodiversity areas. They are already being implemented to some extent in South Africa, but in the absence of a legal or policy framework and thus with little consistency. Systematic application of biodiversity offsets could provide significant benefits at little cost to the fiscus.

Lead agencies: DEAT, SANSI, provincial environment affairs departments

2012 target: Ecosystem guidelines for environmental assessment, generic terms of reference for biodiversity specialist studies in EIAs, a decision-making framework to guide trade-offs where these are unavoidable, and a policy framework for biodiversity offsets have been developed and are being applied nationally.

4.1.4 Develop a regulatory framework for the prevention, containment and eradication of invasive alien species

The Biodiversity Act makes provision for prevention, containment and eradication of IAS in South Africa. The regulations are currently under development and will go a long way in controlling the introduction of most important invasive species.

Lead agency: DEAT

2012 target: IAS regulations are fully implemented by all issuing and competent authorities.

4.1.5 Develop a regulatory framework for access and benefit sharing (ASS)

Regulations for access and benefit sharing are in the process of being developed. They need to be finalised and published.

Lead agency: DEAT

2012 target: ASS regulations are finalised and published. (This should be achieved by 2007.)

4.2 SO 2: Enhanced institutional effectiveness and efficiency

Twenty-year objective: *Enhanced institutional effectiveness and efficiency ensures good governance in the biodiversity sector.*

Top priority actions for 2007 to 2012:

- Establish and implement a capacity building programme within the biodiversity sector to address transformation
- Improve biodiversity information management
- Establish and implement a national biodiversity research strategy
- Establish and implement a national monitoring and reporting framework for biodiversity
- Establish a national programme to build the capacity of local government to include biodiversity opportunities and constraints in municipal planning and operations
- Establish pilot projects to explore mechanisms for integrated natural resource management at the district and local level
- Support the development and strengthening of bioregional programmes

4.2.1 Establish and implement a capacity building programme within the biodiversity sector to address transformation

The biodiversity sector is far from representative of the South African population, reflecting the ongoing legacy of past discrimination and inequalities. In addition to the impacts of apartheid through unequal access to education and other opportunities, the conservation sector was previously seen as the preserve of the privileged few, with the majority of South Africans actively excluded from access to protected areas and the benefits of conservation.

In spite of the growing numbers of jobs in the biodiversity conservation sector, young previously disadvantaged South Africans do not necessarily perceive career opportunities or career paths in the conservation sector. At the same time, the shortage of skilled

conservation managers and professionals holds back the development of the sector and the achievement of biodiversity conservation goals.

To tackle this complex problem, co-ordination of existing capacity building efforts and resources among organisations in the conservation sector is required, as well as investment of additional resources in capacity building. A national capacity building programme should include bursaries, internships, targeted skills development programmes, and learnerships, and should be firmly established and underway by 2012.

Lead agencies: SANBI, DEAr, SANParks, provincial conservation agencies, tertiary education institutions, relevant SETAs

2012 target: National biodiversity conservation capacity building programme, reflecting specific employment equity targets for all key research and implementing agencies in the biodiversity sector, is developed and underway.

4.2.2 Improve biodiversity information management

Substantial improvements in biodiversity information management should include:

- Dramatically improved access to online biodiversity information, co-ordinated through SANBI's Integrated Biodiversity Information System (SIBIS) and the South African Biodiversity Information Facility (SABIF)
- Establishment of SANBI's one-stop-shop for biodiversity information, including spatial biodiversity information provided through Biodiversity GIS (BGIS)

Lead agency: SANSI

2012 target: Web-enabled one-stop-shop for biodiversity information established, recognised and extensively used by managers and professionals.

4.2.3 Establish and implement a national biodiversity research strategy

Research in biodiversity conservation is currently fragmented and relatively uncoordinated, in spite of the need to address pressing research questions.

A national research strategy should be developed by relevant stakeholders, and should guide allocation of research funding. It should articulate priorities by biome, by marine

bioregion and by thematic area, and should link with bioregional programme research strategies where these exist (for example in the Cape Floristic Region).

Lead agencies: SANSI, DST, DEAT (MCM), Water Research Commission, and National Research Foundation

2012 target: National biodiversity research strategy is developed, recognised by all key stakeholders, and is guiding allocation of research efforts and funding.

4.2.4 Establish and implement a national monitoring and reporting framework for biodiversity

SANSI is tasked with monitoring and reporting on the state of biodiversity in the country. This involves the establishment of a national monitoring and reporting framework for biodiversity, currently underway in collaboration with relevant stakeholders.

In addition, bioregional programmes and provincial conservation authorities require monitoring and evaluation frameworks to assess their contribution to biodiversity conservation. It is important for these frameworks to align with the national framework.

Further, a national system for monitoring protected area management effectiveness is an urgent priority, with an emphasis on biodiversity objectives.

Lead agencies: SANSI, DEAT, provincial conservation authorities, bioregional programme co-ordination units, SANParks

2012 target: National biodiversity monitoring and reporting framework is established and being used as the basis for annual reports to parliament and is informing policy direction and implementation. Monitoring and evaluation frameworks for provincial conservation authorities and bioregional programmes feed into the national monitoring and reporting framework.

4.2.5 Establish a national programme to build the capacity of local government to include biodiversity opportunities and constraints in municipal planning and operations

Local, district and metropolitan municipalities play a key role in managing biodiversity and other natural resources, for example through their role in spatial planning, land-use decision-making and infrastructure development. Yet municipalities often do not have the information, systems and human resources to take biodiversity considerations effectively into account in these activities.

Although conservation is not a function of the local sphere of government in terms of the Constitution, municipalities are obliged to providing a safe environment for all residents and to contribute towards sustainable development. In terms of these obligations, municipalities must take biodiversity considerations into account in their planning, decision-making and other functions.

Several pilot projects around the country are working with municipalities to develop tools and methods for building municipal capacity to incorporate biodiversity considerations. Results from these pilot projects should be used to roll such support out to more municipalities. The results of the NSBA can help to identify municipalities that require support most urgently, for example, those with high numbers of threatened ecosystems.

Lead agencies: SALGA, SANSI, DPLG, DEAT, bioregional programme co-ordination units, provincial conservation authorities

2012 target: A national programme to build municipal capacity has been established and is underway, focusing initially on municipalities with, for example, high numbers of threatened ecosystems.

4.2.6 Establish pilot projects to explore mechanisms for integrated natural resource management at the district and local level

In addition to municipalities, a range of agencies, especially at the provincial level, make decisions about land and resource use. For example, provincial departments of environment affairs, provincial conservation agencies, provincial departments of agriculture, provincial offices of the national Department of Agriculture (DoA), Department of Water Affairs and Forestry (DWAF), Department of Minerals and Energy (DME), and Catchment Management Agencies (CMAs) (in the process of being established by DWAF) all make decisions that impact on ecosystem functioning. Although these decisions are frequently taken by provincial and national authorities, their impact is felt at the local level. At the moment, these different organs of state tend to carry out their functions in relative

isolation from each other, with little regard to their combined impact on ecosystem functioning. Integrated planning and management of water and land at the local level is a priority if we are to manage biodiversity and other natural resources effectively.

A relatively simple mechanism to align and co-ordinate natural resource management at the local level would be the appointment of a natural resource management co-ordinator in each district, who would make sure that the staff of different agencies and departments working in the district were in regular contact with each other, aware of priority ecosystems in the area, and not working at cross-purposes. There may be other mechanisms that would be simple and inexpensive. These should be piloted in districts that have high numbers of threatened ecosystems and/or published bioregional plans.

Lead agencies: Provincial conservation authorities, SANSI, DPLG, SALGA, DEAT, bioregional programme co-ordination units

2012 target: Pilots for district natural resource co-ordinators and/or other mechanisms for integrated natural resource management are underway in at least four districts.

4.2.7 Support the development and strengthening of bioregional programmes

Bioregional programmes are multi-institutional, multi-sector, landscape-scale conservation initiatives that aim to facilitate co-operative governance to achieve biodiversity conservation objectives in a manner that stimulates socio-economic benefits. Several bioregional programmes exist already or are being developed (see Section 1.2). These programmes should be supported by DEAT and SANSI, and options for developing additional bioregional programmes, such as programmes for South Africa's three marine bioregions, should be explored. Bioregional programmes provide a key institutional mechanism for achieving the strategic objectives of the NSSAP, particularly 803 and S04.

Lead Agents: DEAT, SANSI, bioregional programme co-ordination units

2012 target: The co-ordination units of the five existing bioregional programmes (C.A.P.E., SKEP, STEP, Grasslands and Wild Coast) are funded by government and effective management structures have been established. At least two new bioregional programmes have been established (marine, freshwater).

4.3 SO 3: Integrated management of terrestrial and aquatic ecosystems

Twenty-year objective: *Integrated terrestrial and aquatic management minimises the impacts of threatening processes on biodiversity, enhances ecosystem services and improves social and economic security.*

The NSBA identified threatened ecosystems in terrestrial and aquatic environments, as well as nine broad priority areas for conservation action (including integrated management of terrestrial and aquatic ecosystems). The results of this assessment, summarised in the box on page 38, and the results of more detailed provincial spatial biodiversity plans where these are available, should guide the spatial focus for implementation of priority actions in 803.

Top priority actions for 2007 to 2012:

- Develop provincial spatial biodiversity plans that identify geographic priorities for biodiversity conservation
- Publish bioregional plans in terms of the Biodiversity Act
- List threatened and protected ecosystems in terms of the Biodiversity Act
- Work with key production sectors to minimise loss and degradation of natural habitat in critical biodiversity areas
- Implement the IAS regulations
- Proceed with implementation of the cross-sector policy objectives for conservation of inland water biodiversity
- Incorporate biodiversity conservation objectives in the work of Catchment Management Agencies
- Develop and implement effective measures for the management and control of activities relating to Genetically Modified Organisms in order to manage their impact on the environment

4.3.1 Develop provincial spatial biodiversity plans

Ideally every province should have a spatial biodiversity plan, based on a systematic biodiversity assessment incorporating both aquatic and terrestrial features, which identifies threatened ecosystems and critical biodiversity areas, and provides guidelines for land-use planning and decision-making in these areas. Several provinces already have

such plans (Gauteng, KZN, Mpumalanga), and others are in the process of developing such plans (Eastern Cape, North West).

Provincial biodiversity plans or fine-scale biodiversity plans at the district or local level should form the basis for bioregional plans published in terms of the Biodiversity Act, as long as they meet the criteria set out in the guidelines for publishing bioregional plans (see priority action 4.3.2).

Biodiversity priorities identified in provincial biodiversity plans should be fed into Provincial Growth and Development Strategies, Provincial Spatial Development Frameworks, EIA supplementation projects, Provincial State of Environment Reports, and other provincial policies and strategies. Provincial biodiversity plans can also be used to inform environmental assessment and land-use decision-making throughout the province, Environmental Management Frameworks, and local and district Spatial Development Frameworks.

Further, provincial biodiversity plans should guide the spatial focus of the work of the provincial conservation authority.

The provincial biodiversity plan should be led by the provincial conservation authority (in some cases an autonomous conservation agency, in others part of the provincial environment affairs department - see list in Section 1.2). Ideally, the provincial conservation authority should house the plan, support its use by other provincial departments, municipalities in the province and other stakeholders involved in biodiversity management. The plan should be updated every five years. SANSI can provide technical support to provincial biodiversity planning initiatives.

Lead agencies: Provincial conservation authorities, SANSI

2012 target: At least six provinces have spatial provincial biodiversity plans in place, with the necessary in-house capacity to maintain and update them.

4.3.2 Publish bioregional plans in terms of the Biodiversity Act

As noted, the Biodiversity Act provides for publishing bioregional plans. These plans underpin integrated management of terrestrial and aquatic ecosystems in priority areas, and will provide a key tool for supporting and streamlining environmental decision-making.

A published bioregional plan must:

- Be based on a systematic biodiversity plan
- Identify critical biodiversity areas on a map, such as threatened ecosystems, ecological corridors, river corridors and wetlands
- Include guidelines for land-use planning and decision-making in critical biodiversity areas

Provincial conservation authorities should play the lead role in developing and publishing bioregional plans, with technical support and advice from SANBI.

Lead agencies: Provincial conservation authorities, SANSI

2012 target: At least seven bioregional plans have been published and are being used routinely to inform land-use planning and decision-making

4.3.3 List threatened and protected ecosystems in terms of the Biodiversity Act

The Biodiversity Act provides for listing of threatened or protected ecosystems. Together with published bioregional plans, listing of threatened or protected ecosystems will facilitate effective management of terrestrial and aquatic ecosystems, and will support and streamline environmental decision-making.

The criteria for identifying threatened or protected ecosystems are currently being developed. Ecosystems that meet the criteria, as well as threatening processes within those ecosystems, need to be identified and listed, along with supporting material such as a handbook with guidelines on how listed ecosystems should be taken into account in planning and decision-making.

The Biodiversity Act provides for the development of biodiversity management plans for threatened ecosystems. Norms and standards for biodiversity management plans will be developed by DEAT.

Lead agencies: DEAT, SANSI, provincial conservation authorities

2012 target: Threatened or protected ecosystems have been identified and listed, and the list has been updated at least once. Appropriate supporting material is available, and listed ecosystems are routinely taken into account in land-use planning and decision-making.

4.3.4 Work with key production sectors to minimise loss and degradation of natural habitat in threatened ecosystems and critical biodiversity areas

As discussed in Section 3.1, loss and degradation of natural habitat are the biggest causes of biodiversity loss in South Africa. Production sectors that are major land and resource users, including agriculture and aquaculture, property development, forestry, mining, fisheries and biofuels, have a vital role to play as custodians of the country's biodiversity. These sectors should **develop and implement sector-specific wise-practice guidelines** to minimise the degree to which their operations result in loss of natural habitat and species in threatened ecosystems and critical biodiversity areas, to protect ecosystem functioning, and to ensure biodiversity-friendly management of GMOs where applicable.

The new tools provided by the Biodiversity Act, including publishing bioregional plans and listing threatened or protected ecosystems, provide important mechanisms for meeting this challenge, by identifying specific geographic areas where loss and degradation of natural habitat should be strongly avoided.

Several collaborative initiatives are already underway between production sectors and the conservation sector, including:

- The Biodiversity and Wine Initiative
- The Mining and Biodiversity Dialogue, led by the Chamber of Mines and IUCN (note that this does not currently address marine mining)
- The South African Sustainable Seafood Initiative, funded by WWF-SA
- The By-Catch Reduction Programme, led by WWF-SA and Birdlife South Africa
- Engagement with Forestry South Africa through the National Grasslands Biodiversity Programme
- Engagement with Potatoes South Africa
- Engagement with the Rooibos Producers Association
- Engagement with the Gamtoos Valley Citrus Growers Association, through the C.A.P.E. programme

- Engagement with the South African Sugar Association, through WWF-SA
- Wildlife industries through the establishment of the Wildlife Forum involving a wide spectrum of role players such as game farmers, the hunting fraternity, taxidermists and organs of state.

Additional production sectors earmarked for collaboration with the biodiversity sector in the next five years include:

- Red Meat Producers Association (red meat production can be highly compatible with biodiversity conservation)
- Game farming sector
- The biofuels sector
- The banking and financial sector, to encourage biodiversity-friendly lending practices
- The property development sectors, particularly coastal property development
- Marine and coastal mining
- The aquaculture sector

Given that the biofuels sector has been identified as a top priority sector for economic growth by ASGISA, it is an urgent priority to develop guidelines for biodiversity-friendly production of biofuels. Biofuels will only contribute to sustainable development if they are produced in a manner that avoids both loss of natural habitat in critical biodiversity areas and over-abstraction of water.

Lead agencies: Provincial conservation authorities, Bioregional programme co-ordination units, relevant industry sector organisations, SANSI, Agri-SA

2012 targets:

- Guidelines for biodiversity-friendly production of biofuels have been developed and are being applied by biofuel producers.
- An "eco red meat" certification system has been developed.
- At least three other production sectors have developed wise practice guidelines to minimise their impact on biodiversity.

4.3.5 Implement the IAS regulations and put in place other control mechanisms and monitor implementation.

Multiple institutions are involved in the prevention, containment and eradication of invasive alien species in South Africa. Key among these institutions are DEAT (including Marine and Coastal Management), Department of Agriculture, Department of Water Affairs and Forestry, Department of Health, Customs and Excise, and Department of Transport (through their management of harbours and airports).

Geographic priority areas for action need to be identified, on the basis of criteria such as impacts on biodiversity and on the economy. Co-ordination and alignment of resource allocation and implementation strategies is needed between these institutions. The immediate challenge is to improve co-operative governance with respect to:

- managing and controlling invasive alien species that are already present in South Africa
- preventing entry of new invasive alien species

As noted in Priority Action 4.1.4, the development of mechanisms for the prevention, containment and eradication of invasive alien species is underway. Once these have been published, their implementation will be one of the urgent priorities.

It is likely that implementation of the regulations published in terms of section 97 (1) (c) (i) for the management, through permitting of alien and listed invasive species will include the designation of issuing authorities and assessment of the risk to the environment of any proposed introduction of alien species that are not exempted from permitting.

Other mechanisms for the achievement of broader objectives as listed below will be:

- Establishment and maintenance of accessible databases and inventories to monitor and report on invasive alien species.
- Establishment of an early warning system for alien species based on analyses of potential risk locations and mechanisms whereby they can invade, and the significance of any actual or potential invasion.
- An improved control system at ports of entry to prevent new introductions.
- Encouragement of the use of indigenous, non-invasive species rather than exotic species at all times, whether the exotic species are known to be invasive or not. This includes species used for horticulture, hunting and fishing.
- Integration of management plans for invasive alien species into other planning and natural resource management processes. In particular, municipalities need assistance

(skills, human resources, equipment, finance, information) to implement plans to control and eradicate invasive alien species.

- Strengthening of the link between invasive alien species control and poverty alleviation.

Lead agencies: DEAT (including MCM), DWAF, DoA, provincial conservation authorities, bioregional programme co-ordination units, SANSI, SANParks, local authorities.

2012 targets:

- Control, monitoring and eradication plans are in place for priority alien invasive species that threaten ecosystems, habitats or indigenous species.
- System to monitor implementation in place

4.3.6 Implement the cross-sector policy objectives for conservation of inland water biodiversity

Mandates for conservation of freshwater biodiversity are often unclear, as water forms part of DWAF's mandate, while biodiversity forms part of DEAT's mandate. DWAF, in collaboration with the CSIR, Water Research Commission, DEAT, Department of Agriculture, SANSI and other relevant departments, has led the development of cross-sector policy objectives and implementation principles to guide the conservation of inland water biodiversity."

There are five cross-sector policy objectives, each with a set of implementation principles. The five objectives are:

- Set and entrench quantitative targets for inland water biodiversity
- Plan for representation of inland water biodiversity
- Plan for persistence of inland water biodiversity
- Establish a portfolio of inland water conservation areas
- Enable effective implementation

A necessary first step for the implementation of these principles is the identification of national freshwater biodiversity priority areas, based on representation and persistence

² Inland water includes rivers, wetland, estuaries and groundwater. Freshwater and inland water have slightly different technical definitions, but are used interchangeably in this document.

targets. On the basis of this, a portfolio of inland water conservation areas should be identified and established. It is essential that these national freshwater biodiversity priority areas are integrated into Catchment Management Strategies (also see Priority Action 4.3.7 below).

A National Freshwater Biodiversity Collaboration is in the process of being established, with a secretariat housed at SANSI. The secretariat of this initiative should play a central role in facilitating the implementation of these principles.

Lead agencies: DWAF, DEAT, SANSI, DoA, provincial conservation authorities.

2012 target: A portfolio of inland water conservation areas has been identified, and mechanisms for implementing appropriate management of these areas are being piloted in at least three Water Management Areas.

4.3.7 Incorporate biodiversity conservation objectives in the work of Catchment Management Agencies

Catchment Management Agencies are currently in the process of being established by DWAF, one in each of the country's 19 Water Management Areas. CMAs should integrate quantitative freshwater biodiversity targets based on the NSBA, as well as national freshwater biodiversity priority areas, into their Catchment Management Strategies, and should assist in the urgent determination and implementation of the ecological reserve for priority river systems and estuaries.

Lead agencies: DWAF, CMAs

2012 target: All CMAs that are established and operational have integrated quantitative freshwater biodiversity targets and national freshwater biodiversity priority areas into their Catchment Management Strategies.

4.3.8 Develop and implement effective measures for management and control of activities relating to Genetically Modified Organisms in order to manage their impact on the environment

The deployment of genetically modified organisms (GMOs) into the environment has been increasing in South Africa over the last seven years. As a result, approximately 500 000 hectares are currently under commercial GM crop production. There are over 40 field trials of GM crops around the country. Most of the debate around GMOs and their use has so far concentrated on the risks of the release of GMOs to natural environments and gene flows between GMOs and natural populations in and/or between different organisms. Thus there is already some understanding of these risks and measures have also been developed to minimize them. However, a substantial amount of basic knowledge is still missing and there has been lack of research into indirect effects of the use of GMOs in the local context. The present system of evaluation relies on the use of desk top risk assessments that have been conducted outside the South African context. There is therefore an urgent need to improve the process of conducting environmental risk assessment through the development of appropriate environmental risk assessment tools for GMOs.

While it is believed that in the future applications of biotechnology may contribute to the mitigation of the environmental impacts of agriculture, there is an urgent need for a comprehensive management framework for GMOs that would address impacts on the environment. This management framework would include the Environmental Risk Assessment for GMOs together with the risk management component that would include long term monitoring of GMOs released into the environment on impacts of GMOs on biodiversity.

The expansion of GM crops has potentially severe implications for ecosystem functioning, if it results in further large-scale loss of natural habitat and use of water. Any expansion of GM crops should be done in a way that avoids loss of natural habitat in threatened ecosystems and critical biodiversity areas identified in bioregional plans. It may make sense to declare GMO-free zones, based on a spatial assessment of biodiversity priority areas as well as adjoining areas which may require special agricultural management systems. The NSBA and provincial biodiversity plans provide a starting point for such an assessment.

DEAT is spearheading the development of a comprehensive Environmental Management System for GMOs. The proposed framework is aimed at providing guidance on:

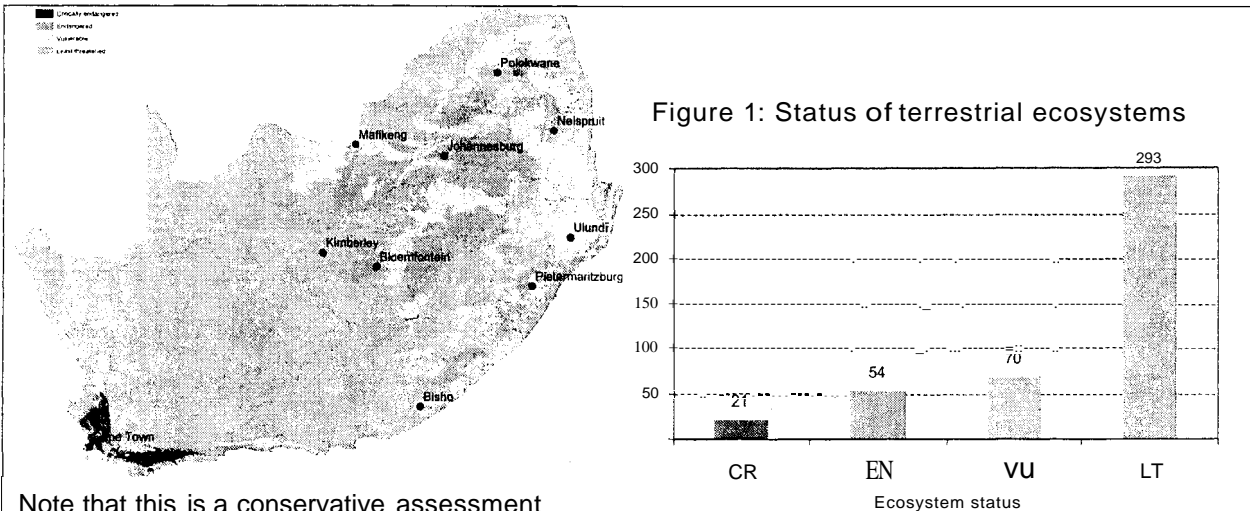
- Regulatory requirements and processes around the deployment of GMOs into environment (taking into consideration the GMO Act, the Biodiversity Act and the EIA Regulations under NEMA)
- The overall Environmental Risk Assessment framework for GMOs
- Appropriate tools for use in identifying impacts to be considered and risks to be assessed, including loss of natural habitat and increased water use
- Long-term monitoring and reporting on GMOs released into the environment
- Priority areas for research on the environmental impacts of GMOs in South Africa
- Outdated technologies that should be phased out in the development of GMOs
- Integration of GMO issues into biodiversity management plans where appropriate

Lead agencies: DEAT, DST, DTI, DoA, DWAF, SANBI

2012 target: Environmental Management System for GMOs has been developed and is routinely used.

BOX: Spatial priorities for integrated management of terrestrial and aquatic ecosystems

The National Spatial Biodiversity Assessment (NSBA) identified threatened ecosystems in the terrestrial, river, estuarine and marine environments, as well as nine broad priority areas for conservation action. The results of these analyses are summarised in the maps and graphs below. Threatened ecosystems include Critically Endangered, Endangered and Vulnerable ecosystems. The NSBA will be updated in 2009.



Note that this is a conservative assessment of the status of terrestrial ecosystems. It is based on *how much natural habitat had been irreversibly lost* in these ecosystems in 1996 (this was the most recent data available), so it is likely that considerably higher numbers of terrestrial ecosystems are threatened than in 2006. In addition, the assessment did not take into account loss of habitat that is reversible, primarily degradation through overgrazing. Some of the "Least Threatened" ecosystems, especially in arid parts of the country such as the succulent karoo, are actually severely degraded.

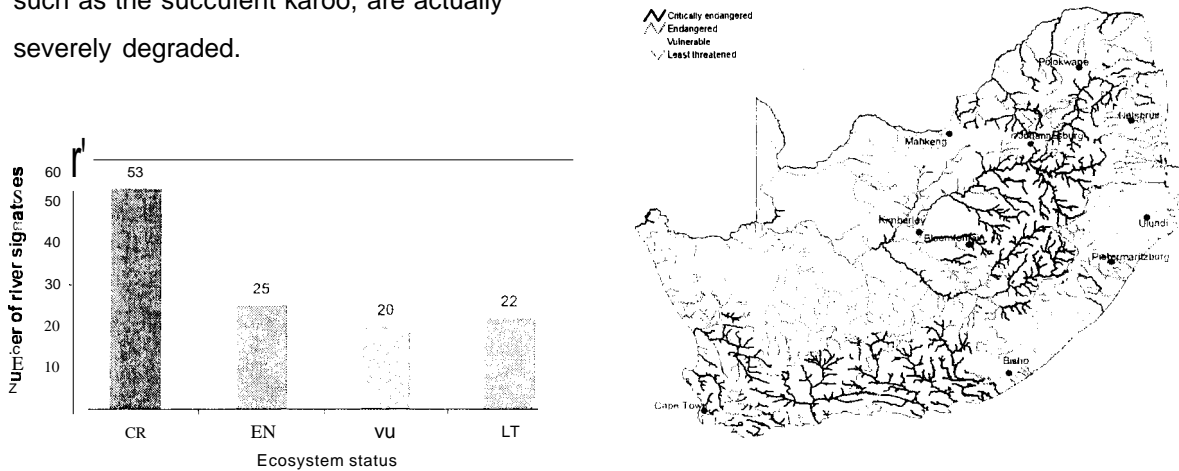


Figure 2: Status of main river ecosystems

Coastal ecosystems deserve particular mention. A great deal of loss of natural habitat has occurred since 1996 in coastal ecosystems especially, mainly as a result of ribbon development along the coastline (high income residential and resort development), The NSBA 2009 is likely to show a much more drastic picture for coastal ecosystems.

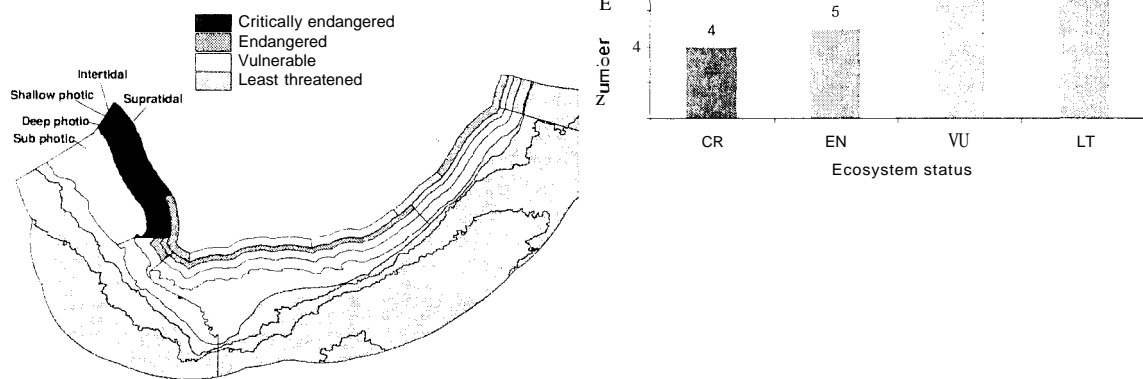
Figure 3: Status of main river ecosystems

The NSBA assessed main river ecosystems only, not tributaries. Many tributaries are in a healthier condition than main rivers,

Nevertheless, the status of South Africa's river ecosystems is much worse than our terrestrial ecosystems, reflecting the fact that we are a water-scarce country with many competing demands on our water resources. As noted in Section 3, over-abstraction of water is the biggest pressure on freshwater ecosystems, followed by loss and degradation of natural habitat and invasive alien species.

Lack of national data on wetlands prevented a full assessment of the status of wetland ecosystems in the NSBA. However, we know that approximately half of South Africa's wetlands have already been irreversibly destroyed, with severe consequences for water quality, water quantity and flood control. All wetlands should be considered critical biodiversity areas in which further loss of habitat should be completely avoided.

Figure 4: Status of marine biozones



In general, marine biozones further from the shore are less threatened

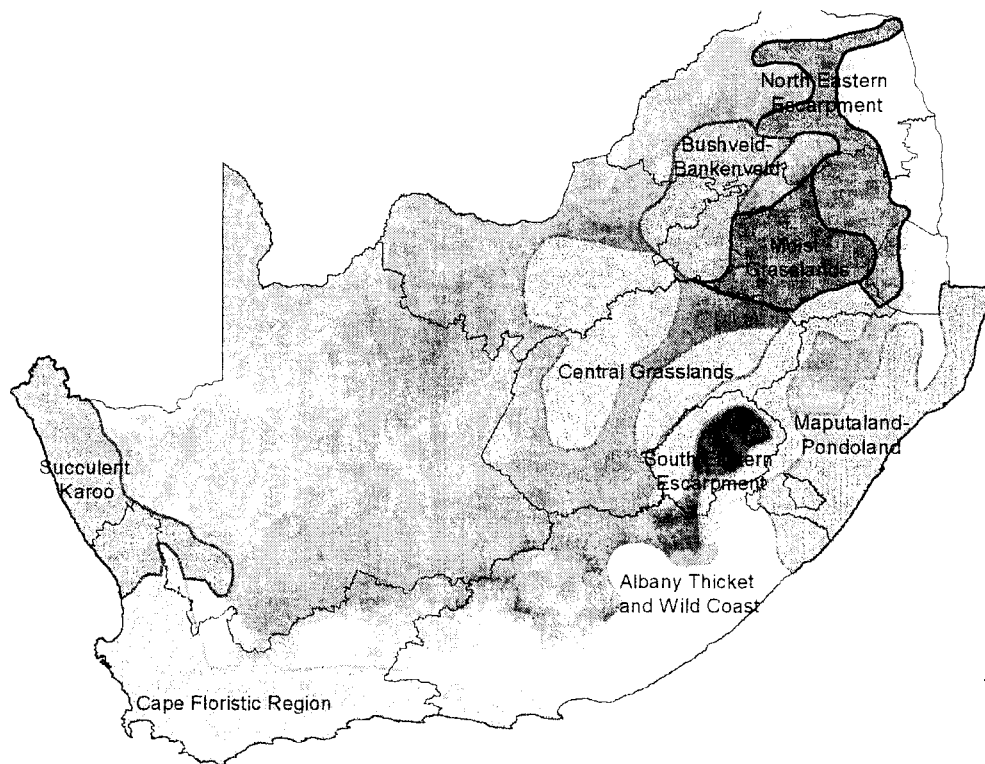
than those closer to the shore, which are much more accessible to human-related impacts. The overall picture for marine ecosystems is less dramatic than for freshwater ecosystems, but worse than for terrestrial ecosystems.

Table 1: Summary of NSBA ecosystem status results

| | Terrestrial ecosystems | River ecosystems (mainstreams only) | Estuary groups | Marine biozones |
|----------------------------|------------------------|-------------------------------------|----------------|-----------------|
| Critically endangered (CR) | 5% | 44% | 23% | 12% |
| Endangered (EN) | 13% | 27% | 39% | 15% |
| Vulnerable (VU) | 16% | 110/0 | 15% | 38% |
| Threatened = CR + EN + VU | 34% | | 77% | 65% |

Based on combined scores for ecosystems, species and ecological processes, the NSBA identified

nine broad priority areas for conservation action. These confirm the location of South Africa's existing bioregional programmes, and provide potential pointers for the establishment of additional



bioregional programmes.

Figure 5: Nine broad priority areas for conservation action

The boundaries of these priority areas are rough, not exact, and this map does not imply that there is no important biodiversity in the rest of the country. However, given limited resources we cannot act everywhere at once, so it makes sense to focus actions on places where the return is likely to be greatest. These priority areas also highlight places where neighbouring provinces need to co-operate in managing significant biodiversity resources that cross provincial boundaries.

4.4 SO 4: Sustainable use of biological resources and equitable sharing of the benefits

Twenty-year objective: *Human development and well-being is enhanced through sustainable use of biological resources and equitable sharing of the benefits.*

(Note that the focus in this strategic objective is on genes and species, rather than whole ecosystems.)

Top priority actions for 2007 to 2012:

- Address illegal and unregulated fishing and seafood trade, especially of line fish and abalone
- Develop an implementation strategy for bio-prospecting regulations
- Develop the natural products sector
- Improve knowledge of sustainable extractive use of terrestrial resources

4.4.1 Address illegal and unregulated fishing and seafood trade, especially of line fish and abalone

The problem of over-exploitation of marine resources is complex, and the lack of up-to-date assessments means that the status of many marine species is poorly understood. However, there are some key problems and solutions that stand out:

A state of emergency was declared in South Africa's line fishery in 2000, and it is still considered in crisis. As noted in Section 3.4, the stocks of eleven line fish (many of which are still commonly served in restaurants) have collapsed, putting these fish in danger of commercial extinction. Fishing and seafood trade (sale of fish to retailers and restaurants) must be more effectively policed.

Abalone poaching must be more effectively policed, and abalone should be CITES listed. Specific abalone reserves are needed, with effective policing, so that stocks can recover. A Red List for South African marine species should be developed. Updated line fish status reports are urgently required, and recovery plans should be implemented where possible.

An ecosystem approach to fisheries management should be widely implemented. This involves the development of best practice guidelines in the fishing industry to:

- Limit by-catch
- Limit loss and degradation of marine habitats as a result of fishing practices
- Limit other indirect impacts of fisheries on the marine environment, such as impacts on top predators

Well located marine protected areas can play a substantial role in sustainable use of marine resources, by protecting nursery grounds and replenishing fish resources for

adjacent fished areas. The need to expand marine protected areas is addressed in priority actions 4.5.1 and 4.5.2.

Lead agencies: DEAT (MCM), South African Sustainable Seafood Initiative (SASSI), coastal provinces, WWF-SA (Marine Programme), SANSI

2012 target: Linefish status reports are updated, recovery plans are implemented for 6 species and the ecosystem approach is implemented in all major commercial fisheries

4.4.2 Develop an implementation strategy for bio-prospecting regulations

Our legacy of enormously rich biodiversity resources makes South Africa a particularly attractive place for bio-prospecting, and as such genetic engineering may well generate significant new opportunities. However, recent court actions have brought attention to the problem of ownership of these commonly held resources falling into the hands of multi-national companies.

Draft regulations on bio-prospecting have been developed, dealing with the following categories of issues:

- Permitting procedures and issuing authorities
- Benefit Sharing Agreements
- Material Transfer Agreements
- Bio-prospecting Trust Fund
- Exemptions to old permits that comply with the regulations by the Minister

Once these regulations have been approved by the Cabinet, the priority action will be the development of an implementation strategy.

Lead agency: DEAT

2012 target: Implementation strategy for bio-prospecting regulations has been developed, and milestones or targets identified in the strategy are being reached.

4.4.3 Facilitate the development of the natural products sector

South Africa's natural products sector is growing, but has significant unrealised potential. The natural products sector can be defined broadly to include any biological products, including agricultural products. However, a narrower definition promoted by the natural products sector in Southern Africa holds greater benefits for the poor rural communities and for the environment. This definition, supported by the IUCN, focuses on plant-based products that are indigenous and harvested from the wild. Natural products defined in this narrower way are likely to be pro-poor and pro-biodiversity - pro-poor because barriers to participation in harvesting from the wild are low (no capital investment is needed), and pro-biodiversity because harvesting from the wild, as long as it is sustainably managed, is inherently more biodiversity-friendly than cultivation. It is recognised that as markets grow, options for organic cultivation may need to be explored. Lipid oils, which have anti-ageing properties and are used as ingredients in cosmetics, are a particularly promising sub-sector.

The Natural Futures Programme, led by IUCN in partnership with PhytoTrade Africa, the Southern African Natural Products Trade Association, focuses on addressing market barriers to the emergence and growth of the pro-poor, pro-biodiversity natural products sector.

Four important ways to facilitate development of the natural products sector are:

- Facilitate international trade. Currently there are significant barriers to trade in natural products that should be addressed, including:
 - Lack of awareness of the special needs of the natural products sector, or its significance, among trade officials, negotiators and decision-makers.
 - Significant non-tariff barriers, including onerous regulatory environments in important export markets. For example, in terms of the European Union's novel foods regulation, food products that do not have a history of use in the EU (such as baobab pulp) are considered potentially dangerous, even if they have been used for centuries elsewhere. Overcoming these barriers is prohibitively expensive for producers and needs high-level support.
 - A standards vacuum for many natural products. For example, there are no sanitary and phyto-sanitary standards for natural products. Other standards are inappropriate for Southern African conditions. The establishment of standards setting bodies for natural products would facilitate trade.
 - Export facilitation is a major barrier. For example, the lack of appropriate transport facilities and transport channels for natural products poses a

problem. Often, natural products are not shipped in quantities large enough to fill a container, resulting in unnecessary costs.

- Facilitate certification. Certification (for example as organic or fair trade) is critical for realising the potential of the natural products sector, as it enables access to high value niche export markets that provide the price premiums necessary to make harvesting of natural products a viable livelihood option. Existing international certification systems are inaccessible for small local producers, because of the complexity and cost of the certification process. Addressing barriers to certification for small producers at the system level, market level and product level is necessary to enable market access.
- Grow domestic demand through increased awareness. The major markets for Southern African natural products are currently export markets. Consumers in the South African market are often not aware of natural products or may have negative perceptions of these products. Growing the domestic market for natural products should be tackled alongside the ongoing development of export markets. Building awareness of the properties and significance of natural products among South African consumers is an important step in developing the domestic market.
- Strengthen natural products enterprises and supply chain management. The potential supply of natural products is large, especially if there is co-operation between Southern African countries. However, natural products enterprises need to be supported and supply chain management must be improved to ensure a stable supply. Reliable supply is crucial for developing markets and realising the potential of the sector. Supply chain management includes ensuring that local producers capture an appropriate amount of the value in the supply chain. Experts in the natural products sector should collaborate with providers of venture capital and business development services (e.g. financial management, marketing and business planning support services), to make them aware of the potential of the sector and its particular needs. Biotrade legislation should provide a balance between incentives for R&D and investment in the sector, and benefits to South Africa and local communities.

Lead agencies: DEAT, IUCN, SANSI, OTI, DST, DAC, research institutions, NGOs

2012 target:

- Facilitate international trade
- Facilitate certification

- Grow domestic demand through increased awareness
- Strengthen natural products enterprises and supply chain management

4.4.4 Improve knowledge of sustainable extractive use of terrestrial resources

In the terrestrial environment, the ecological sustainability of extractive use of biological resources needs to be assessed and monitored, and opportunities for improvement identified. Our knowledge and understanding of this aspect of sustainable development, which is particularly important for the rural poor, is inadequate.

In particular, South Africa has a wealth of indigenous knowledge on medicinal plants, many of which are harvested from the wild by traditional healers. Collaboration with traditional healers to understand the limits to sustainable extraction of these plants, and to develop cultivation strategies where appropriate, is a priority.

Lead agencies: SANSI, research institutions

2012 target: Knowledge of the extent of harvesting and limits to sustainable extractive use of at least ten medicinal plants is developed, and species management plans have been developed for at least five medicinal plants in collaboration with user groups.

4.5 SO 5: Expanded network of conservation areas

Twenty-year objective: *A network of conservation areas conserves a representative sample of biodiversity and maintains key ecological processes across the landscape and seascape.*

The NSSA included an assessment of which terrestrial and aquatic ecosystems are currently under-protected. The results of this assessment, summarised in the box on page 50, should guide the implementation of priority actions in 805.

Top priority actions for 2007 to 2012:

- Finalise the twenty-year protected area expansion strategy, underpinned by the national biodiversity targets in the NSSA, refined for biomes, provinces and marine biozones

- Implement Phase 1 of twenty-year protected area expansion strategy
- Establish and strengthen provincial stewardship programmes
- Establish National Botanical Gardens in unrepresented provinces

4.5.1 Finalise the twenty-year protected area expansion strategy, underpinned by the national biodiversity targets

DEAT is leading the development of a protected area expansion strategy, which will include:

- Clear quantitative and spatially explicit priorities for protected area expansion by biome, by province and by marine biozone
- Explicit institutional roles and responsibilities for protected area expansion
- Clear implementation phases

The NSBA sets biodiversity targets for all ecosystems. These biodiversity targets tell us how much of the ecosystem should ideally be protected within a formal, well-managed protected area. The NSBA assesses the current protection level of each ecosystem in relation to its biodiversity target, and points to under-protected ecosystems. By far the majority of ecosystems are under-protected; it is not feasible to meet biodiversity targets for all ecosystems within the next twenty years. The protected area expansion strategy will identify a subset of national biodiversity targets to be met in the next twenty years.

The expansion strategy should make the links between protected area development, sustainable tourism, and benefits to surrounding communities who should be key stakeholders in protected areas.

The following actions are required to support the development and implementation of the protected area expansion strategy:

- Developing an accurate, up-to-date map of protected areas in South Africa. The existing map is reasonably good but not complete.
- Populating the protected area register currently being developed by DEAT.
- Drawing on analyses undertaken in provincial spatial biodiversity plans and fine-scale biodiversity plans at the sub-provincial level, where these exist, to supplement the national analysis of protected area expansion priorities.

Lead agencies: DEAT (including MCM), SANParks, provincial conservation authorities, SANSI

2012 targets:

- Protected area expansion strategy finalised and supported by all key implementing agencies.
- Complete, up-to-date map of protected areas widely available.
- Protected area register fully populated.

4.5.2 Implement Phase 1 of twenty-year protected area expansion strategy

The twenty-year protected area expansion strategy, based on national biodiversity targets, should be phased. Phase 1 should be implemented in the 2007 to 2012 period.

Lead agents: DEAT (including MCM), SANParks, provincial conservation authorities

2012 target: 8,50/0 of terrestrial area and 20% of marine area is included in protected area network

4.5.3 Establish and, strengthen provincial stewardship programmes

The NEM: Protected Areas Act provides for any land, including private or communal land, to be declared a formal protected area, and allows for co-management of such a protected area by the landowner(s) or any suitable person or organisation. This means that formal protected area status, with an associated property rates exclusion in terms of the Municipal Property Rates Act, is not limited to state-owned land, and that government agencies are no the only organisations that can manage protected areas, opening the way for a range of innovative protected area arrangements that were not previously possible.

Stewardship programmes involve using these new provisions in the NEM: Protected Areas Act to contract critical biodiversity areas in private or communal ownership as formal protected areas. A well established stewardship programme exists in the Western Cape, led by CapeNature, but is under-resourced relative to its strategic importance for securing the province's biodiversity. A new stewardship programme in KwaZulu-Natal and embryonic stewardship programmes in the Northern Cape and Gauteng need to be nurtured, and additional provinces should be encouraged to establish stewardship programmes.

A national stewardship co-ordinator has been appointed by the Endangered Wildlife Trust, on a one-year contract (August 2006 - July 2007) funded by DEAT, to determine the support needs of provinces in relation to stewardship, and to design and set up a national stewardship support programme in collaboration with provincial conservation authorities. Options for sustaining the national stewardship co-ordinator position beyond the initial year should be explored.

SANSI, through the bioregional programme co-ordination units, should play a supportive role with respect to stewardship, for example through providing opportunities for lesson sharing and networking.

Lead agencies: DEAT, provincial conservation agencies, NGOs, SANSI, Local Authorities

2012 target: At least five provinces have active stewardship programmes.

4.5.4 Establish additional National Botanical Gardens

SANBI manages eight National Botanical Gardens in five provinces. These gardens showcase and protect indigenous species, and provide important recreational and educational facilities. Not all South Africa's biomes or provinces are currently represented in the National Botanical Garden estate. The Eastern Cape and Northern Cape are priorities for establishment of new National Botanical Gardens. Criteria for National Botanical Gardens are included in the Appendix.

Lead agent: SANSI, DEAT.

2012 target: At least two new National Botanical Gardens have been established.

BOX: Spatial priorities for expanding the protected area network

The National Spatial Biodiversity Assessment included an assessment of the current protection levels of terrestrial and aquatic ecosystems. An important principle underpinning the NSBA is that we should strive towards having a *representative sample of all ecosystems* included in formal protected areas. At the moment, some ecosystems are well protected, while others are poorly protected or not protected at all. An ecosystem is considered well protected if its biodiversity target is met in a formal protected area. Formal protected areas include National Parks, Provincial Nature Reserves, Local Authority Nature Reserves and DWAF Forest Nature Reserves.

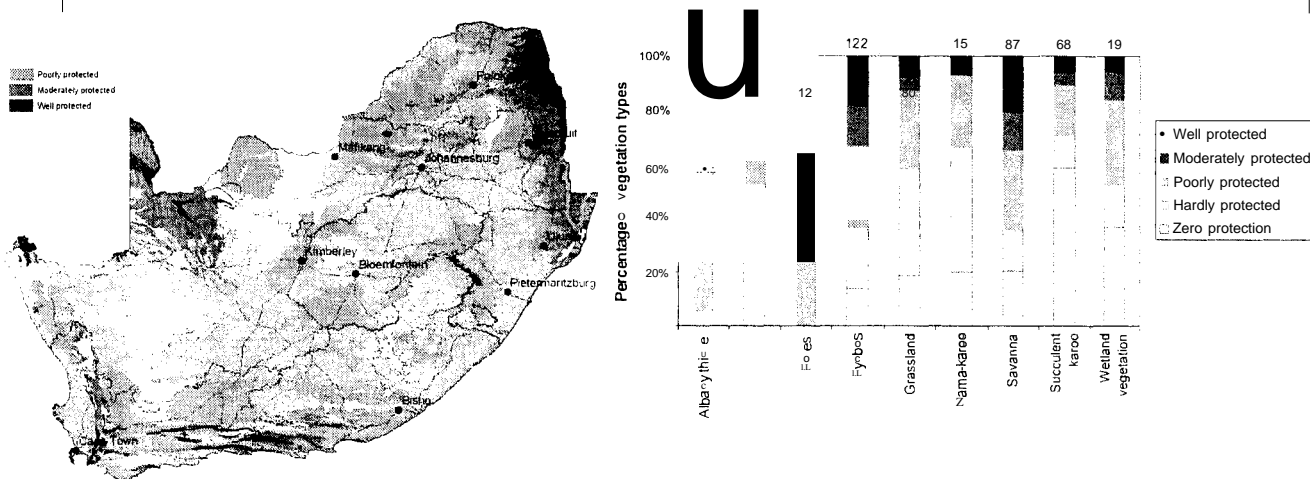


Figure 6: Protection levels of terrestrial ecosystems

South Africa's protected area network was not designed to protect a representative sample of ecosystems, so it is not surprising that nearly half the country's terrestrial ecosystems have no or extremely low levels of formal protection. Overall, approximately 5% of the country's land area is included in formal protected areas, but this is not distributed evenly across all ecosystems. Most of our well protected ecosystems are in the fynbos mountains and the savanna biome, while the most severely under-protected ecosystems tend to be in the succulent karoo, the grasslands and the fynbos lowlands.

In expanding out protected area network, it makes sense to focus on biomes and ecosystems that are currently under-protected, to bring us closer the ideal of a representative sample of all ecosystems in formal protected areas.

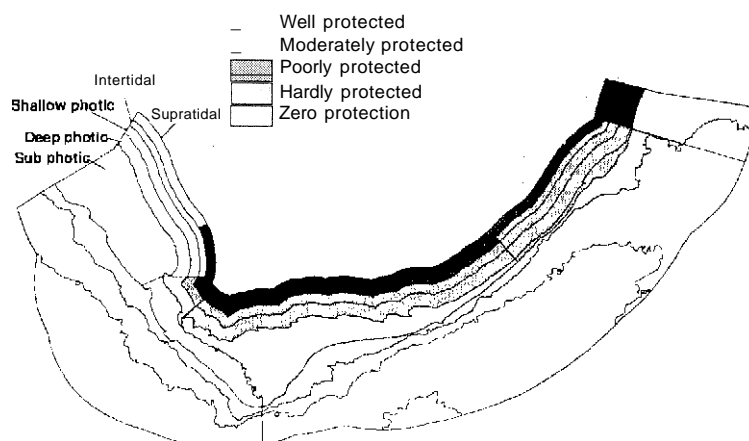


Figure 7: Protection levels of marine biozones

Twenty-three of our 34 marine biozones are poorly protected, hardly protected or not protected at all. Overall, only 1.6% of South Africa's water's are protected. Priority areas for expanding the marine protected area estate are the Namaqua (West Coast) and Agulhas Bank biozones.

Protection levels of river ecosystems are more difficult to assess than protection levels of terrestrial and marine ecosystems. If part of a river ecosystem flows through a protected area, or if a river forms the boundary of a protected area (as is often the case), should that river ecosystem be considered protected or not? The establishment and management of formal protected areas has usually focused on protecting terrestrial ecosystems (or on other socio-economic objectives), with little emphasis on proclaiming protected areas to protect entire river lengths. In any case this is not a practical management option for most river systems, which cross large distances in the landscape. More importantly, rivers are impacted by activities that take place throughout their entire catchments, so even if a whole river length is included in a protected area, the river is still subject to impacts that could originate far away. For all these reasons, it does not make sense to assess simply whether biodiversity targets for river ecosystems are met in formal protected areas or not.

The cross-sector policy objectives referred to in priority action 4.3.6 suggest the establishment of inland water conservation areas, designed to protect river ecosystems and other inland water ecosystems such as wetlands. Mechanisms for establishing and managing inland water conservation areas need to be explored in the rollout of these policy objectives. They may differ from mechanisms for establishing and managing terrestrial and marine-focused protected areas, not least because of the linear nature of river ecosystems.

5. Regional Co-operation

South Africa is a strong supporter of African initiatives, such as the New Partnership for Africa's Development (NEPAD), the principles of which include sustainable use of natural resources and environment. NEPAD identifies biodiversity, desertification and climate change as key issues in its Environmental Initiative Plan and has adopted a strategy for sustainable environmental management.

Regional co-operation is particularly important to South Africa. As a member of the Southern African Development Community (SADC), the country has signed a number of SADC protocols which apply to water, wildlife, fisheries and forestry, such as the Protocol on Wildlife Conservation and Law Enforcement in SADC, which entered into force in 1999.

In addition, a number of agreements have been signed with neighbouring countries, or are in the process of being negotiated, for the establishment and co-management of Transfrontier Conservation Areas (TFCAs), between South Africa and Namibia, Botswana, Zimbabwe, Mozambique, Lesotho and Swaziland. These include:

- Maloti-Drakensberg
- Lubombo
- Limpopo Sashe
- Kgalagadi
- Greater Limpopo Transfrontier Project (GLTP)
- !Ai-!Ais/Richtersveld

5.1 Regional co-operation in the NBSAP

Strategic Objective 2 in the NBSAP deals with enhanced institutional effectiveness and efficiency, and good governance. As part of this strategic objective, the following activities were identified with regard to regional co-operation:

Activity 2.7.1: Align policies, strategies and programmes of South Africa, SADC and African Union, including NEPAD, where possible and strategic.

The biodiversity of the continent is an asset and can play a strategic role in development. Conservation and sustainable use of biodiversity requires management across political and administrative boundaries. It is therefore important to align policies and their

implementation, especially for resources that cross boundaries, such as water, migratory birds and animals, GMOs and invasive alien species. It is also important to develop common positions and lobbying strategies where necessary, for example with regard to bioprospecting, biosafety and trade issues.

Activity 2.7.2: Develop partnerships and cooperative arrangements with neighbouring countries regarding shared resources

It is especially important to align policy and practice with neighbouring countries and other countries in southern Africa. This includes partnerships and cooperation on research, training and capacity building programmes, sharing of data and taking neighbouring countries' needs into account, especially with regard to shared water resources and marine resources. Coastal and deep-water fisheries are important renewable natural resources for South Africa and our neighbouring countries and contribute to food security, livelihoods, job creation, tourism development and economic growth. South Africa needs to work closely with Namibia and Mozambique in particular, to safeguard marine resources and co-operate on aspects such as research, management, monitoring and enforcement. South Africa is also an important roleplayer in the Antarctic region.

Activity 2.7.3: Establish coalitions with groups of like minded countries to ensure that South Africa's biodiversity management objectives are not prejudiced by international trade agreements

Trade agreements and other aspects of globalisation can have significant impacts on biodiversity in South Africa, which need to be understood and anticipated, and measures put in place to minimise these impacts.

Activity 2.7.4: Strengthen capacity for international negotiation by developing common positions with other countries where possible and strategic

South Africa can play an important catalytic role in the international community and this role will be strengthened by developing common positions on key policy issues. In particular, South Africa should seek to strengthen its position by aligning with a common African position.

Activity 2.7.5: Implement a coordinated programme to build capacity across all relevant departments and institutions to engage with processes relating to multilateral agreements

There is a need to build capacity, including negotiation skills, and to coordinate and prepare inter-disciplinary teams to attend inter-sessional and technical meetings to understand issues and processes, before attending Conference of the Parties and other high level meetings.

Activity 2.7.6: Develop, implement and strengthen programmes for international scientific collaboration, sharing of information and technology transfer

South Africa has in the past played a significant role in research and capacity building in the region, in fields such as biodiversity, climate change, invasive species, biotechnology, etc. Such programmes should be strengthened and expanded and particular attention paid to collaboration and information sharing. At the same time, we can learn much from our neighbours, for example with regard to sustainable use and land management.

5.2 Relevant aspects of the SADC Regional Biodiversity Strategy

The SADC Regional Biodiversity Strategy (Fourth Draft) (June 2005) identified the following eight priority constraints and issues:

- Increased pressure and demand on biodiversity and agricultural land due to limited alternative livelihood opportunities outside agriculture and natural resource exploitation
- Inadequate biodiversity inventory and monitoring system, and knowledge on and ability to handle biodiversity information
- Inadequate incentives for biodiversity conservation and its sustainable use
- Low levels of awareness, knowledge and appreciation of biological resources at various levels
- Weak institutional and legal frameworks for implementing biodiversity initiatives
- Limited and unsustainable funding for implementing biodiversity programmes
- Inadequate research and development approaches for biodiversity initiatives
- Limited attention to the management of GMOs and invasive alien species

5.3 Priorities for regional co-operation in the next five years

Top priority actions for 2007-2012:

- Strengthen and improve the development of integrated management and tourism plans of the transfrontier conservation areas

- Develop and implement appropriate incentives for biodiversity conservation and its sustainable use in cooperation with our neighbouring countries
- Develop, implement and strengthen programmes for international scientific collaboration, sharing of information and technology transfer
- Develop and implement a coordinated regional programme to increase awareness, knowledge and appreciation of biological resources at various levels
- Strengthen the research and development capacity of the protected area system

5.3.1 Strengthen and improve the development of management plans for the transfrontier conservation areas

Integrated management and tourism plans are in the process of being developed for six transfrontier conservation areas involving South Africa and all neighbouring countries (Botswana, Namibia, Mozambique, Swaziland and Zimbabwe). These plans will identify and protect important features of ecosystems and provide guidelines for development within the protected environments. The development and implementation of these plans will be led by the implementing agencies of the participating countries with the involvement of all stakeholders.

Lead agent: DEAT in co-operation with the relevant implementing agencies of the neighbouring countries, SANParks

2012 target: Six integrated management and tourism plans in place.

5.3.2 Develop and implement appropriate incentives for biodiversity conservation and its sustainable use in cooperation with our neighbouring countries

There have been very limited incentives for biodiversity conservation and its sustainable use at both local and national levels in southern Africa. Reasons for this include communal land tenure systems; restrictive policies and legislation; and the low economic value of most biological resources and the limited benefits that accrue to communities. Therefore, the economic value of biological resources should be emphasised and mechanisms to equitably share the resultant benefits should be developed.

Lead agents: DEAT in co-operation with relevant agencies in SADC

2012 target: At least one regional incentive scheme for biodiversity conservation in place

5.3.3 Develop, implement and strengthen programmes for regional scientific collaboration, sharing of information and technology transfer

The biodiversity inventory and monitoring methods tend to vary between countries. This makes it difficult to compare results, especially on trans-boundary initiatives. Furthermore, the technical and institutional capacity to conduct inventories and monitoring studies varies across the region. In addition, the capacity to handle and utilize the available knowledge is limited.

Furthermore, the existing biodiversity inventory and monitoring systems have not taken into account the values and aspirations of local people on the basis of their indigenous knowledge. Such knowledge has been transmitted from generation to generation. It has, and continues to play an important role in areas such as food security; agricultural development; and human, animal and plant health. The incorporation of indigenous knowledge into biodiversity inventory and monitoring systems is therefore critical given that local communities have lived with and managed biological resources for centuries.

Lead agents: SANSI and relevant institutions in neighbouring countries

2012 target: One uniform regional information system in place

5.3.4 Develop and implement a coordinated regional programme to increase awareness, knowledge and appreciation of biological resources at various levels

In southern Africa, biological resources are largely considered as a medium for development and not a source of development. Consequently, very limited information and knowledge on them in terms of their value, status and potential exists. In situations where such information is available, it has not been properly packaged and disseminated to relevant stakeholders. As a result, natural resources are taken for granted and expected to avail themselves for exploitation whenever the need arises.

Lead agents: DEAT and relevant regional institutions

Target 2012: An appropriate regional awareness, information and knowledge on biological resources at various stakeholder levels strategy in place.

5.3.5 Strengthen the research and development (R&D) capacity of the protected area system

Throughout southern Africa, expenditure on research and technology development is way below 1% of the GOP. In addition, very few to no incentives are offered to the private sector to encourage it to invest in R&D. Furthermore, most development models in the region have considered biological resources as a source of sustenance and not as a source of wealth. The foregoing scenario largely explains the limited R&D attention that has gone into areas such as value addition, bioprospecting, policy and institutional analysis, appropriate development models and targeted research into emerging issues such as the wildlife, livestock and human interface. Given the high costs and level of expertise needed in such R&D efforts, there is need for partnerships with local, regional and international NGOs, the private sector and international cooperating partners.

Lead agents: DEAT and relevant regional institutions, research and academic institutions

Target 2012: An appropriate regional R&D approach for biodiversity initiatives in place

6. Implications for Lead Agencies and Other Stakeholders

The following table summarises the National Biodiversity Implementation Plan as set out in the NBSAP. No new activities are identified; they are simply grouped by Strategic Objective, with lead agency identified by LA, and involved stakeholders identified by √, for easy reference.

DEAT and SANBI are lead agencies for many of the priority activities identified in the NSF. In addition, these two organisations have a vital role to play in driving the implementation of the NBF by catalysing the actions of other lead agents, especially those whose core business is not biodiversity but whose active collaboration is required in order to achieve the NSF targets.

TABLE 2: NBSAP NATIONAL BIODIVERSITY IMPLEMENTATION PLAN AND IMPLICATIONS FOR MAJOR STAKEHOLDERS:

| Activities to achieve outcomes | | DEAT | SANBI | SANPARKS | WAF | MA | LA | ME | DTI | OAC | STRATEGY ARCH | TREASURY | Stats SA | PRONCIS | PLG | SALGA | NGS | |
|--|---|------|-------------------------------|----------|-----|----|----|----|-----|-----|---------------|----------|----------|---------|-----|-------|-----|--|
| | | LA | LA | | | | | | | | | | | | | | | |
| SO 1: An enabling policy and legislative framework integrates biodiversity management objectives into the economy | | | | | | | | | | | | | | | | | | |
| 1.1 The value of biodiversity to the economy and to people's lives is quantified and monitored in order to inform policy, strategy and action. | 1.1.1 Conduct a periodic country-wide total economic valuation of biodiversity, with an emphasis on goods and services, that draws linkages between biodiversity, the <u>economy and poverty alleviation</u> . | LA | LA | | | | | | | | √ | | | | | | | |
| | 1.1.2 Determine periodically, at the local and regional scale, the use values of biological resources and ecosystems to people at a household level, and identify opportunities to <u>encourage the sustainable management of biological resources and ecosystems</u> | LA | LA | √ | √ | √ | | | | | √ | | √ | | | | | |
| | 1.1.3 Package and sell the economic case for the importance of biodiversity, tailored to key decision-makers. | LA | √ | √ | √ | √ | | | | | √ | | | | | | | |
| | 1.1.4 Reflect biodiversity values in national macroeconomic indicators in order to monitor changes in natural capital. | √ | √ | | | | | | | | | | | LA | | | | |
| 1.2 Biodiversity considerations are integrated into macro-economic, trade, industrial, and tax policy. | 1.2.1 Engage proactively and constructively with National Treasury to ensure that biodiversity is a key consideration in policy development, budgeting, planning and auditing processes. | LA | √ | | | | | | | | | √ | | | | √ | | |
| | 1.2.2 Integrate biodiversity considerations in policy development, budgeting and planning processes in the DTI. | √ | √ | | | | | | LA | | | √ | | | | | | |
| | 1.2.3 Include biodiversity accounting in corporate environmental audits. | LA | All stakeholders to implement | | | | | | | | | | | | | | | |
| | 1.2.4 Target the banking industry and financial sector to identify incentives and opportunities to integrate biodiversity considerations into investment and lending policies. | √ | | | | | | | | √ | | | | | | | | |
| 1.3 Biodiversity considerations are integrated into resource management policy and legislation. | 1.3.1 Integrate biodiversity considerations in the National Strategy for Sustainable Development. | LA | √ | | | | | | | | | | | | | | | |
| | 1.3.2 Integrate biodiversity considerations in the National Climate Change Response Strategy and Action Plan and the National Action Programme to Combat Land Degradation. | LA | √ | √ | √ | √ | √ | | | | √ | | | √ | | | √ | |
| | 1.3.3 Engage proactively and constructively with state departments and agencies to ensure that biodiversity is a key consideration in the policy development, budgeting and planning processes. | LA | All stakeholders to implement | | | | | | | | | | | | | | | |

| <i>Activities to achieve outcomes</i> | | CEAT | SANBI | SANPARKS | OWAF | CoA | OLA | DME | CTI | CAO | CST/RESEARCH | TR&S | Stats SA | PROVINCES | CPG | SA-GA | NGOs |
|--|---|------|-------|----------|------|-----|-----|-----|-----|-----|--------------|------|----------|-----------|-----|-------|------|
| | 1.3.4 Integrate biodiversity considerations in policy development, budgeting and planning processes in DWAF. | ✓ | ✓ | | LA | | | | | | | | | | | | |
| | 1.3.5 Integrate biodiversity considerations in policy development, budgeting and planning processes in the DoA. | ✓ | ✓ | | | LA | | | | | | | | | | | |
| | 1.3.6 Integrate biodiversity considerations in policy development, budgeting and planning processes in the DME | ✓ | ✓ | | | | | LA | | | | | | | | | |
| | 1.3.7 Integrate biodiversity considerations into tourism growth strategies, guidelines and codes of conduct. | LA | | | | | | | | | | | | ✓ | | | ✓ |
| | 1.3.8 Include biodiversity considerations in fishing regulations and guidelines, in order to mitigate negative impacts on biodiversity and encourage sustainable practices. | LA | | | | | | | ✓ | | | | | ✓ | | | ✓ |
| | 1.3.9 Align and/or rationalise legislation on land use regulation and catchment management. | ✓ | ✓ | | ✓ | ✓ | LA | | | | | | | | | | |
| | 1.3.10 Develop a national policy framework to guide the implementation of biodiversity offsets (off-site mitigation) in threatened ecosystems, ecological corridors and other special habitats. | LA | ✓ | | | | | | | | | ✓ | | ✓ | | | |
| | 1.3.11 Align, rationalise and/or develop (as appropriate) legislation on incentives for appropriate land management in biodiversity priority areas. | ✓ | | | ✓ | LA | ✓ | | | | | ✓ | | ✓ | | | |
| | 1.3.12 Rationalise legislation on invasive alien species. | LA | | | | ✓ | | | | | | | | | | | |
| | 1.3.13 Rationalise legislation on genetically modified organisms | ✓ | | | | LA | | | ✓ | | | | | | | | |
| | 1.3.14 Finalise policy and regulations on translocation of wildlife, including extra-limital game and aquatic species. | LA | | | | ✓ | | | | | | | | ✓ | | | |
| 1.4 A national biodiversity planning and assessment framework informs all decisions regarding land and resource use and spatial development. | 1.4.1 Set quantitative national targets for all ecosystems and for threatened, endemic, indicator, flagship and high-value useful species. | ✓ | LA | | | | | | | | ✓ | | | | | | |
| | 1.4.2 Update the NSBA at least every five years, to assess the status of terrestrial, freshwater, estuarine and marine ecosystems, to identify ecosystems where no further loss or degradation of natural habitat should occur, and to identify gaps in the protected area network. | ✓ | LA | | ✓ | | | | | | ✓ | | | | | | ✓ |
| | 1.4.3 Ensure that the National Spatial Development Perspective takes the National Spatial Biodiversity Assessment into account. | ✓ | ✓ | | | LA | | | | | | | | | ✓ | | |

| Activities to achieve outcomes | | oZAT | SANBI | SANPARKS | oWAF | o-A | oLA | oME | oTI | oAC | oST/IR/SES/ARCH | TRASURY | Stats SA | PROGNOSIS | oPLG | SA-GA | NG's | |
|--|--|--------------------------------------|--|----------|------|-----|-----|-----|-----|-----|-----------------|---------|----------|-----------|------|--------------|------|--|
| | 1.4.4 Integrate biodiversity considerations in policy development, budgeting and planning processes in the Department of Provincial and Local Government. | ✓ | ✓ | | | | | | | | | | | | LA | ✓ | | |
| | 1.4.5 Explore and develop innovative mechanisms to integrate biodiversity management and land reform programmes, to mutually benefit both land reform and biodiversity objectives. | ✓ | ✓ | | ✓ | LA | | | | | | | | | | | | |
| | 1.4.6 Engage with provinces, metropolitan, district and local municipalities to integrate biodiversity into provincial and local planning and environmental management. | LA | LA | | ✓ | | | | | | | | | ✓ | | | ✓ | |
| | 1.4.7 Integrate biodiversity considerations in Strategic Environmental Assessment, Integrated Environmental Management and Environmental Impact Assessment. | LA | LA | | ✓ | | | ✓ | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| 502: Enhanced institutional effectiveness and efficiency ensures good governance in the biodiversity sector | | | | | | | | | | | | | | | | | | |
| 2.1 The biodiversity sector is transformed and representative of South African society. | 2.1.1 Implement programmes to promote and retain racial and gender representation at all levels in the sector. | All stakeholders to implement | | | | | | | | | | | | | | | | |
| | 2.1.2 Promote integration of different cultural perspectives in the organisational culture and image of the biodiversity sector. | All stakeholders to implement | | | | | | | | | | | | | | | | |
| 2.2 Co-operative governance at all levels results in improved biodiversity management. | 2.2.1 Clarify the biodiversity related mandates of different organs of state within the provisions of new legislation. | LA | | | | | | | | | | | | | ✓ | | | |
| | 2.2.2 Ensure that Environmental Implementation Plans (EIPs), Environmental Management Plans (EMPs) and State of Environment Reports at local, provincial and national level incorporate and reflect biodiversity objectives. | LA | All stakeholders responsible for EMPs and SoE reports | | | | | | | | | | | | | ditto | | |
| | 2.2.3 Investigate and implement options for effective co-operation between national, provincial and local spheres of government, and between the sectoral departments and local level. | ✓ | | | | | | | | | | | | | ✓ | LA | ✓ | |
| | 2.2.4 Develop and implement mechanisms for collaboration and partnerships to effectively manage ecosystems and species that cross administrative boundaries. | LA | | | | | | | | | | | | | ✓ | ✓ | ✓ | |
| | 2.2.5 Improve the mechanisms for cooperation and partnerships between government, business and civil society, for example by developing a Biodiversity Charter in consultation with all stakeholders. | ✓ | LA | | | | | | | ✓ | | | | | | | | |
| | 2.2.6 Strengthen the co-ordinating role of South African National Biodiversity Institute (SANBI), particularly in biodiversity information collation and management, biodiversity research, biodiversity planning, and bioregional programmes. | ✓ | LA | | | | | | | | | ✓ | ✓ | | | | | |
| | 2.2.7 Document and disseminate lessons learned for cooperative governance, building on replicable successes of existing biodiversity programmes where appropriate. | ✓ | LA | | | | | | | | | | | | ✓ | ✓ | ✓ | |

| <i>Activities to achieve outcomes</i> | | CEAT | SANBI | SANPARKS | OWAF | CoA | LA | MEM | CTI | COO | OST/RESEARCH | TRASURY | Stats SA | PROVINCES | DLG | SALGA | NGOs | | |
|---|--|--|-------------------------------|-------------------------------|------|-----|----|-----|-----|-----|--------------|---------|----------|-----------|-----|-------|------|----|--|
| 2.3 Institutions with biodiversity related responsibilities and programmes are effective, efficient and adequately capacitated. | 2.3.1 Perform self-assessment of capacity to implement the NBF in relation to the geographic and thematic priorities in the NBF, and refocus activities, reallocate resources and develop capacity according to the priorities in the NSF. | LA | All stakeholders to implement | | | | | | | | | | | | | | | | |
| | 2.3.2 Provide technical support to municipalities to integrate biodiversity into planning and environmental management. | √ | √ | √ | | | | | | | | | | √ | √ | | | | |
| | 2.3.3 Strengthen the capacity of existing and emerging non governmental organisations and community-based organisations in the biodiversity sector, with an emphasis on representivity. | √ | | | | | | | | | | | | | | | | LA | |
| | 2.3.4 Maximize opportunities for civil society and community involvement in implementation and monitoring of the National Biodiversity Framework. | LA | LA | All stakeholders to implement | | | | | | | | | | | | | | | |
| | 2.3.5 Assess the impact of HIV/AIDS on institutional capacity in the biodiversity sector and implement an appropriate strategy to address this. | All stakeholders to implement | | | | | | | | | | | | | | | | | |
| | 2.3.6 Implement an ongoing programme to strengthen enforcement, including voluntary and mandatory compliance mechanisms. | All departments with regulatory function & provinces | | | | | | | | | | | | | | | LA | | |
| | 2.3.7 Integrate enforcement functions relating to biodiversity management into the mandates of the Environmental Management Inspectorate. | LA | | | | | | | | | | | | | | | | | |
| | 2.3.8 Ensure that the mechanisms for fair decision-making and conflict management provided for in the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) are able to address disputes regarding conservation and use of biodiversity. | LA | LA | | | | | | | | | | | | | | | | |
| | 2.3.9 Develop appropriate record keeping, monitoring and auditing procedures to enable assessment and review of the effectiveness of regulations. | LA | | | | | | | | | | | | | LA | | | | |
| 2.4 Financial resources for biodiversity management are adequate, and effectively and efficiently used. | 2.4.1 Include the costs of implementation of the NSF in the annual budget plans of national, provincial and local spheres of government. | All government institutions | | | | | | | | | | | | | | | | | |
| | 2.4.2 Provide financial support/mechanisms to municipalities to encourage conservation of biodiversity, with a particular focus on priority areas. | LA | | | | | | | | | | LA | √ | √ | √ | | | | |
| | 2.4.3 Allocate and use national and provincial public sector budgets more effectively to ensure and reward good biodiversity management practices. | All government institutions | | | | | | | | | | | | | | | | | |
| | 2.4.4 Increase the pool of non-state resources available for biodiversity management. | LA | √ | √ | √ | √ | | | | | | √ | LA | √ | √ | √ | √ | √ | |
| 2.5 Information management systems, research priorities, and monitoring and evaluation frameworks are in | 2.5.1 Identify major gaps in knowledge and understanding of biodiversity through a collaborative process, design collaborative programmes that fill these gaps, and ensure that biodiversity inventories and atlases meet the requirements of bioregional planning and monitoring. | | LA | | | | | | | | √ | | | | | | | | |

| Activities to achieve outcomes | | DEAT | SANBI | SANPARKS | WAF | COA | OLA | ME | TI | CO | STR/RES/ARCH | TRASURV | Stats SA | PROANCES | PLG | SALGA | NGOS | |
|--|--|------|-------|----------|-----|-----|-----|----|----|----|--------------|---------|----------|----------|-----|-------|------|--|
| place and effectively supporting biodiversity management. | 2.5.2 Update South African Red Data Lists and implement a coordinated long-term programme to continually update these data. | | LA | | | | | | | | ✓ | | | ✓ | | | | |
| | 2.5.3 Establish and maintain accessible data and information systems to inform policy, strategy, action and reporting. | | LA | | | | | | | | ✓ | | | ✓ | | | | |
| | 2.5.4 Establish a monitoring and evaluation framework (including indicators and thresholds) for ecosystems and species, with a particular emphasis on threatened ecosystems and species. | | LA | | | | | | | | | ✓ | | ✓ | | | | |
| | 2.5.5 Establish a monitoring and evaluation framework (including indicators and thresholds) for invasive and alien species, loss and degradation of natural habitat, climate change and other threatening processes on biodiversity. | | LA | | | | | | | | | ✓ | | ✓ | | | | |
| | 2.5.6 Develop national norms and standards for monitoring management effectiveness in protected areas, with an emphasis on biodiversity objectives. | LA | ✓ | | | | | | | | | | | ✓ | | | | |
| | 2.5.7 Develop and implement effective mechanisms for review and revision of research and monitoring programmes. | | LA | | | | | | | | | ✓ | | | | | | |
| 2.6 A comprehensive and proactive national communication, awareness raising and advocacy strategy reaches targeted sectors and facilitates conservation and wise use of biodiversity. | 2.6.1 Develop and implement a coordinated and comprehensive communication, awareness and advocacy campaign to reach key decision makers in parliament | LA | LA | LA | ✓ | ✓ | | | | | ✓ | | | LA | | LA | ✓ | |
| | 2.6.2 Design and implement a creative and innovative advocacy and communication strategy to make biodiversity concerns relevant to communities throughout South Africa. | LA | LA | LA | ✓ | ✓ | | | | | ✓ | | | LA | | LA | ✓ | |
| | 2.6.3 Design and implement focused awareness campaigns on threatening processes, including invasive alien species and climate change, that aim to change behaviour in the public and private sectors. | LA | LA | ✓ | LA | LA | | | | | | | | ✓ | | | ✓ | |
| | 2.6.4 Design and implement biodiversity education programmes. | ✓ | LA | ✓ | | | | | | | | | | ✓ | | | ✓ | |
| 2.7 Proactive engagement and cooperation with the international community enhances conservation and sustainable use of shared resources and globally important biodiversity in South Africa. | 2.7.1 Align policies, strategies and programmes of South Africa, the Southern African Development Community (SADC) and African Union, including the New Partnership for Africa's Development (NEPAD), where possible and strategic. | LA | | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| | 2.7.2 Develop partnerships and cooperative arrangements with neighbouring countries regarding shared resources. | LA | | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| | 2.7.3 Establish coalitions with groups of like minded countries to ensure that South Africa's biodiversity management objectives are not prejudiced by international trade agreements. | LA | | | | | | | | | | | | | | | | |

| Activities to achieve outcomes | | AT | MBI | PARKS | WAF | OA | LA | ME | TI | AC | ST/RS/ARC | TRASUR | Stats SA | PRCANCES | OPLO | SAGA | NGP |
|---|--|----|---------------------------------------|-------|-----|----|----|----|----|----|-----------|--------|----------|----------|------|------|-----|
| | 2.7.4 Strengthen capacity for international negotiation by developing common positions with other countries where possible and strategic. | √ | | | | | | | | | | | | | | | |
| | 2.7.5 Implement a coordinated programme to build capacity across all relevant departments and institutions to engage with processes relating to multilateral agreements. | √ | Relevant departments and institutions | | | | | | | | | | | | | | |
| | 2.7.6 Develop, implement and strengthen programmes for international scientific collaboration, sharing of information and technology transfer. | | LA | | | | | | | | √ | | | | | | |
| | 2.7.7 Play a proactive role in conservation and sustainable use of Antarctic species, ecosystems and resources. | LA | | | | | | | | | √ | | | | | | |
| <i>S03: Integrated terrestrial and aquatic management minimizes the impacts of threatening processes on biodiversity, enhances ecosystem services and improves social and economic security.</i> | | | | | | | | | | | | | | | | | |
| 3.1 National initiatives to manage terrestrial and aquatic ecosystems are coordinated, developed and implemented with full stakeholder participation to contribute to sustainable socio-economic development. | 3.1.1 Integrate biodiversity management objectives into national and provincial programmes to combat land degradation. | √ | LA | | √ | √ | √ | √ | | | √ | | | | | | |
| | 3.1.2 Ensure that CMAs integrate terrestrial and aquatic biodiversity management in their operations. | √ | √ | | LA | √ | √ | √ | | | √ | | | | √ | √ | √ |
| | 3.1.3 Determine, implement and monitor the ecological reserve for all priority rivers, taking estuaries into account. | | | | LA | | | | | | √ | | | √ | | | |
| | 3.1.4 Integrate biodiversity objectives into the national River Classification system by linking the biodiversity conservation status of rivers to guidelines for water management and to land practice and management in the quaternary catchment. | | √ | | LA | √ | | | | | | | | √ | | | |
| | 3.1.5 Implement integrated coastal management programmes that address biodiversity management objectives in production activities in the coastal zone. | LA | | | | | | | | | | | | √ | | √ | |
| | 3.1.6 Develop and implement integrated programmes to minimise impacts on marine biodiversity. | LA | | | | | | | | √ | | | | √ | | | |
| 3.2 Key production sectors and industries integrate biodiversity into their production and service standards. | 3.2.1 Include biodiversity considerations in guidelines and best practice codes of key agricultural industries, to mitigate negative impacts of agricultural production on biodiversity and encourage sustainable agricultural practices. | √ | √ | | | LA | | | | | | | | √ | | | √ |
| | 3.2.2 Include biodiversity considerations in forestry industry guidelines and best practice codes to mitigate negative impacts of commercial forests and harvesting of natural forests on biodiversity and encourage sustainable forestry practices. | √ | | | √ | | | | | | | | | √ | | | √ |
| | 3.2.3 Include biodiversity considerations in mining guidelines and best practice codes to mitigate negative impacts on biodiversity and encourage sustainable mining practices. | √ | √ | | | | | | √ | | | | | | | | |

| <i>Activities to achieve outcomes</i> | | DEAT | SANBI | SANPARKS | WAF | DOA | LA | ME | TI | AO | ST/RESEARCH | TREASURY | Stats SA | PROCESSES | PLG | SALGA | NG's |
|---|---|------|-------|----------|-----|-----|----|----|----|----|-------------|----------|----------|-----------|-----|-------|------|
| | 3.2.4 Include biodiversity considerations in fishing industry guidelines and best practice codes, to mitigate negative impacts of fishing on biodiversity and encourage sustainable fishing practices. | LA | | | | | | | ✓ | | | | | ✓ | | | |
| | 3.2.5 Include biodiversity considerations in property development and real estate guidelines and best practice codes. | | | | | | LA | | | | | | | ✓ | | | |
| 3.3 A multi-agency national programme deals with the full suite of impacts posed by invasive alien species across the landscape and seascape. | 3.3.1 Ensure institutional cooperation and coordination at the operational level to deal with the full suite of impacts posed by invasive alien species. | LA | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | | | ✓ | ✓ | ✓ | |
| | 3.3.2 Prevent the entry and spread of new invasive alien species into South Africa. | LA | ✓ | | ✓ | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | |
| | 3.3.3 Control and eradicate invasive alien species listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), with an emphasis on urgent action in biodiversity priority areas. | LA | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | | | ✓ | ✓ | ✓ | |
| | 3.3.4 Create economic opportunities linked to the control and management of invasive alien species. | ✓ | | | LA | ✓ | | | | | ✓ | ✓ | | | | | |
| 3.4 An integrated national programme facilitates adaptation to the predicted impacts of climate change on biodiversity across the landscape and seascape. | 3.4.1 Implement an integrated programme for climate change adaptation, with an emphasis on vulnerable ecosystems and sustainable livelihoods. | LA | LA | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| | 3.4.2 Ensure that the protected area network is designed to allow for long-term species and ecosystem responses to climate change. | LA | LA | ✓ | | | | | | | | | | ✓ | | | |
| 3.5 Effective management and control measures minimize the potential risks to biodiversity posed by Genetically Modified Organisms. | 3.5.1 Ensure institutional cooperation and coordination to deal with the potential risks posed by Genetically Modified Organisms. | LA | | | | ✓ | | | ✓ | | ✓ | | | | | | ✓ |
| | 3.5.2 Develop and implement effective measures for management and control of potentially risky activities relating to Genetically Modified Organisms. | LA | | | | ✓ | | | | | ✓ | | | | | | ✓ |
| | 3.5.3 Share information and provide support to maximize benefits and minimize risks associated with Genetically Modified Organisms. | LA | | | | ✓ | | | ✓ | | ✓ | | | | | | ✓ |
| 3.6 Effective waste management and pollution control measures limit the impacts of pollution on biodiversity. | 3.6.1 Implement effective waste management and pollution control measures, with particular emphasis on aquatic ecosystems in biodiversity priority areas. | LA | LA | ✓ | LA | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| 3.7 Research and monitoring programmes support integrated management of terrestrial | 3.7.1 Carry out research on the impact of all current and future threatening processes on biodiversity, and mechanisms for adaptation, management and mitigation of threatening processes, including alien invasive species, climate change, GMOs, and production activities. | ✓ | LA | ✓ | | | | | | | ✓ | | | ✓ | | | ✓ |

| Activities to achieve outcomes | | WEST | NORTH | SANPARKS | WALF | WAL | LA | WAL | TI | WAL | STRSEARCH | TRASURV | Stats Sp | PRONCES | PLG | SALGA | SOO | |
|--|--|------|-------|----------|------|-----|----|-----|----|-----|-----------|---------|----------|---------|-----|-------|-----|---|
| and aquatic ecosystems. | 13.7.2 Monitor and evaluate the impact on biodiversity of integrated management of terrestrial and aquatic ecosystems, to support adaptive management. | ✓ | LA | | ✓ | ✓ | ✓ | | | | | | | ✓ | | | | |
| 504: Human development and well-being is enhanced through sustainable use of biological resources and equitable sharing of the benefits. | | | | | | | | | | | | | | | | | | |
| 4.1 An equitable access, rights and responsibilities regime promotes sustainable use of biological resources. | 4.1.1 For priority biological resources, manage and where appropriate, clarify and promote rights to access/use the resources. | LA | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | | | ✓ | | | | |
| | 4.1.2 Develop and promote appropriate mechanisms for equitable and sustainable distribution of benefits derived from extractive resource use. | LA | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | ✓ | | | ✓ | |
| | 4.1.3 Create an appropriate bioprospecting framework that encourages beneficiation of our indigenous biological resources and knowledge in a way that benefits South Africans. | LA | ✓ | | | ✓ | | | | | ✓ | | | | | | | ✓ |
| | 4.1.4 For priority biological resources, clarify and promote responsibilities for control and management of resources at local level. | LA | | | | | | | | | | | | | | | LA | |
| 4.2 Partnerships between government, the private sector, organized civil society and communities encourage entrepreneurship, innovation, investment and action at local level. | 4.2.1 Streamline processes and procedures for small scale public-private-community partnerships to encourage partnerships at local level, with a particular emphasis on communal and state land. | | | | | ✓ | | | LA | | | | | | | | | |
| | 4.2.2 Develop and grow the natural products sector in a way that encourages value adding, sustainability, entrepreneurship and local economic development. | ✓ | | | | ✓ | | | LA | LA | LA | | | | | | ✓ | |
| | 4.2.3 Provide financial, marketing and management support to biodiversity-based small businesses. | ✓ | | | | ✓ | | | LA | | | | | | | | | |
| | 4.2.4 Promote sustainable use of game mammals and birds as a conservation compatible land use that provides economic benefits. | LA | ✓ | | | ✓ | ✓ | | | | | | | | | | | ✓ |
| 4.3 The ecological and social sustainability of extractive use of biological resources is assessed and monitored and opportunities for improvement are identified and implemented. | 4.3.1 Undertake research on sustainable use, including collating information on extractive use of biological resources, and assessing this use for sustainability, contribution to livelihoods, potential for improved benefits and/or management and identify priority resources. | ✓ | LA | ✓ | ✓ | ✓ | | | | | ✓ | | | | | | | |
| | 4.3.2 Incorporate indigenous knowledge and cultural considerations into research, management and monitoring of biological resources. | | LA | | | ✓ | | | | LA | LA | | | | | | | |
| | 4.3.3 Assess the potential for appropriate sustainable resource use in protected areas and include this in park management plans. | ✓ | LA | ✓ | ✓ | | | | | ✓ | ✓ | | | | | | | ✓ |
| | 4.3.4 Monitor the impact of trade in wildlife and wild plants on biodiversity. | LA | LA | | | | | | | | | | | ✓ | | | | |
| | 4.3.5 Implement programmes for ongoing research, assessment and monitoring to fill gaps and further inform policy, strategy and action. | | LA | ✓ | ✓ | ✓ | | | | | | ✓ | | | | | | ✓ |

| Activities to achieve outcomes | | DEAT | SANBI | SANPARKS | OWAF | OWA | OLA | OME | OTI | OAO | OSTIR&ARCH | TR&ASURY | Stats SA | PROVINCES | CP&G | SA&GA | NGO's |
|--|--|------|-------|----------|------|-----|-----|-----|-----|-----|------------|----------|----------|-----------|------|-------|-------|
| 4.4 Use of biological resources is well managed to optimize sustainable benefits. | 4.4.1 Prioritize management and/or recovery plans for resources that contribute significantly to livelihoods, are being severely impacted on, and/or are significant in terms of biodiversity, cultural or economic considerations. | ✓ | LA | ✓ | ✓ | ✓ | | ✓ | | | | | | ✓ | | | ✓ |
| | 4.4.2 Strengthen adaptive management systems for marine living resources to ensure sustainable offtake and recruitment. | LA | | | | | | | | | | | | ✓ | | | |
| | 4.4.3 Establish <i>ex situ</i> management programmes, including nurseries, to relieve pressure on harvesting of wild medicinal plants. | ✓ | LA | ✓ | ✓ | ✓ | | | | | | | | LA | | | ✓ |
| | 4.4.4 Establish community based natural resource management programmes for subsistence and artisanal use of wild resources, such as medicinal plants and fuel wood, by communities. | ✓ | LA | ✓ | ✓ | ✓ | | | | | | | | LA | | | |
| | 4.4.5 Develop enforceable restrictions on unsustainable use and trade in species of national and international importance, where necessary. | LA | | | | ✓ | | | ✓ | | | | | ✓ | | ✓ | |
| <i>SO 5: A network of conservation areas conserves a representative sample of biodiversity and maintains key ecological processes across the landscape and seascape.</i> | | | | | | | | | | | | | | | | | |
| 5.1 Biodiversity priority areas identified in the National Spatial Biodiversity Assessment are refined in provincial, regional and local systematic biodiversity plans. | 5.1.1 Undertake systematic biodiversity plans in priority areas identified in the National Spatial Biodiversity Assessment and/or in regional biodiversity plans. | ✓ | LA | | | | | | | | | | | ✓ | | | |
| | 5.1.2 Publish bioregional plans in terms of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004). | ✓ | LA | | | | | | | | | | | ✓ | | | ✓ |
| 5.2 The protected area network is secured, expanded and managed to ensure that a representative sample of biodiversity and key ecological processes are conserved. | 5.2.1 Expand, consolidate and/or rationalise the protected area network through a range of implementation tools, focusing on priority areas for representation and persistence of biodiversity. | LA | ✓ | | | | | | | | | | | LA | | | |
| | 5.2.2 Build understanding among relevant protected area officials of the variety of implementation tools for expanding the protected area network, and build capacity for using these tools and for managing land consolidation for protected areas. | LA | ✓ | | | | | | | | | | | LA | | | ✓ |
| | 5.2.3 Undertake focused engagement with land reform programmes, and explore opportunities for expanding the protected area network through land reform. | LA | | | | | LA | | | | | | | ✓ | | | |
| | 5.2.4 Manage protected areas effectively and efficiently, including development of protected area management plans and engaging with surrounding communities and landowners. | LA | ✓ | | | | | | | | | | | LA | | | |
| | 5.2.5 Develop a national funding strategy, including cross-financing mechanisms, to ensure that the protected area network is well resourced. | LA | | | | | | | | | | ✓ | | ✓ | | | |
| 5.3 Biodiversity is effectively managed in key ecological corridors and in high priority | 5.3.1 Develop, publish and implement biodiversity management plans for threatened ecosystems in terms of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), with private and communal landowners as key roleplayers. | LA | LA | | | | | | | | | | | LA | | | ✓ |

| <i>Activities to achieve outcomes</i> | | CEAT | SANBI | SANPARKS | WAF | FA | CLA | ME | DTI | CAC | STRASSEARH | TRISURY | Stats SA | PROCES | PLG | SALGA | NGS |
|---|--|------|-------|----------|-----|----|-----|----|-----|-----|------------|---------|----------|--------|-----|-------|-----|
| fragments of natural habitat across the landscape and seascape. | 5.3.2 Build the extension services in conservation agencies, in collaboration with other departments that have extension services, to engage more widely with private and communal landowners. | LA | | | ✓ | ✓ | | | | | | | | LA | | | ✓ |
| | 5.3.3 Ensure that threatened ecosystems, ecological corridors and other special biodiversity features (such as wetlands, coastal dunes and ridges) are given appropriate status in Spatial Development Frameworks, and are adequately weighed in decisions about land-use change. | LA | LA | | | | | | | | | | | ✓ | ✓ | LA | ✓ |
| | 5.3.4 Engage with major production sectors, such as agriculture, forestry, mining and fisheries, in order to implement biodiversity offsets and to enhance operational standards in areas of high biodiversity significance, with emphasis on long-term persistence of threatened ecosystems and key ecological processes. | LA | ✓ | | | | | | ✓ | | | | | ✓ | | | |
| 5.4 Management plans for species of special concern ensure their long-term survival in the wild. | 5.4.1 Develop, publish and implement management plans for species of special concern, including threatened species, endemic species and high-value useful species, with private and communal landowners as key role players. * (but some species more urgent) | LA | ✓ | | | | | | | | ✓ | | | ✓ | | | |
| 5.5 Research and monitoring programmes support the establishment and effective management of the network of conservation areas. | 5.5.1 Undertake applied research that addresses key management issues in protected areas. | ✓ | LA | LA | | | | | | | ✓ | | | ✓ | | | ✓ |
| | 5.5.2 Undertake research on key management questions related to biodiversity compatible land and resource use in priority areas outside the formal protected area network. | LA | LA | ✓ | ✓ | ✓ | | | | | ✓ | | | ✓ | | | ✓ |
| | 5.5.3 Monitor management effectiveness in protected areas, with an emphasis on biodiversity objectives. | ✓ | LA | LA | | | | | | | ✓ | | | ✓ | | | |
| | 5.5.4 Monitor the effectiveness of interventions and programmes in priority areas outside formal protected areas, with an emphasis on biodiversity objectives. | LA | LA | ✓ | ✓ | ✓ | | | | | ✓ | | | ✓ | | | |

7. Monitoring and Reviewing the NSF

It is clear from Section 4 that implementation of the NSF is the joint responsibility of a range of lead agencies and supporting partners, with DEAT and SANSI playing a co-ordinating, catalysing role in addition to implementing specific priority actions.

Monitoring the implementation of the NSF is primarily DEAT's responsibility. SANSI may be delegated to assist.

The NSF must be reviewed every five years. The review should be led by DEAT in collaboration with all lead agents and other key stakeholders, and should involve:

- Assessing progress towards implementing priority actions identified in the current NSF
- Assessing progress towards achievement of the NSSAP strategic objectives
- Reviewing and revising priority actions for the following five-year period, and compiling these into an updated NSF
- Publishing the updated NSF

In order to assess progress towards implementing priority actions identified in the current NSF, the lead agent(s) for each priority action will be required to report to DEAT on progress with implementation two years before the end of the five-year NSF cycle, according to a reporting format supplied by DEAT. The intention is not to create new, onerous reporting responsibilities, so reporting requirements will be kept to the minimum.

NSF implementation reports from all lead agents will be synthesised and assessed in preparation for workshops with key stakeholders to develop the updated NSF.

8. The Biodiversity Act Toolbox

The Biodiversity Act provides for a range of mechanisms for sustainable use and conservation of biodiversity, in addition to the NBF. These other mechanisms include:

- Guidelines for publishing bioregional plans (expected to be published in 2007)
- Regulations on invasive alien species (expected to be published in 2007)
- Regulations on access and benefit sharing (expected to be published in 2007)
- Regulations on bio-prospecting (expected to be published in 2007)
- Norms and standards on hunting (expected to be published in 2008)
- Regulations on threatened and protected species (expected to be published in 2007)
- Listing of threatened and protected species (national list expected to be published in 2007)
- Listing of threatened and protected ecosystems (identified as a priority action in the NBF, first national list expected to be published in 2008)
- Norms and standards for biodiversity management plans for species (expected to be published in 2007)
- Norms and standards for biodiversity management plans for ecosystems (expected to be published in 2008)

References

DEAT. 2005a. *National Biodiversity Strategy and Action Plan: Country Study*. Pretoria: Department of Environment Affairs and Tourism.

DEAT. 2005b. *National Biodiversity Strategy and Action Plan*. Pretoria: Department of Environment Affairs and Tourism.

De Villiers, CE, Driver, A, Brownlie, S, Clark, B, Day E.G, Euston-Brown, DIW, Helme, NA, Holmes, PM, Job, N & Rebelo, AB. 2005. *Fynbos Forum Ecosystem Guidelines for Environmental Assessment in the Western Cape*. Cape Town: Fynbos Forum c/o Botanical Society of South Africa: Conservation Unit. (Available from Wendy Paisley paisley@botanicalsociety.org.za)

De Wit: M P. 2006, The value of biodiversity to the South African economy: a preliminary study. Report No SO 6001.

Driver, A, Maze, K, Rouget, M, Lombard, AT, Nel, J, Turpie, JK, Cowling, RM, Desmet, P, Goodman, P, Harris, J, Jonas, Z, Reyers, S, Sink, K & Strauss, T. 2005. National Spatial Biodiversity Assessment 2004: Priorities for Biodiversity Conservation in South Africa. *Strelitzia* 17. Pretoria: South African National Biodiversity Institute. (Available at www.sanbi.org or from bookshop@sanbi.org)

Endangered Wildlife Trust. 2002. *The biodiversity of South Africa 2002: indicators, trends and human impacts*. Cape Town: Struik.

Millennium Ecosystem Assessment. 2005- Slides of Assessment Panel

Roux, DJ, Nel, JL, MacKay, HM & Ashton, PJ. *Discussion paper on cross-sector policy objectives for conserving South Africa's inland water biodiversity*. Water Research Commission Report No TT 276/06. Pretoria: Water Research Commission. (Available at www.csir.co.za/rivercons/outpolicy.html)

Southern African Development Community. 2005: Regional Biodiversity Strategy (Fourth Draft June 2005)

Appendix A: Criteria for Establishing National Botanical Gardens

National botanical gardens should ideally be strategically positioned according to the following minimum criteria:

Community support

- linked to an active local branch of the Botanical Society of South Africa
- supported by the local community and civil society

Services

- with a perennial river(s) flowing through the property
- with a suitable water supply
- with a reliable supply of electricity and sewerage lines

Horticultural potential

- with suitable areas of arable soil for the landscaped portion of the garden

Landscape

- includes varying topography, slopes, environmental conditions and microclimates

Accessibility

- SANSI may allow, regulate or prohibit access by the public to the national botanical garden
- close to (within 20 km of) a major urban centre
- within a 30 km catchment area of at least 250,000 people
- easily accessible to staff and potential visitors from major road routes

Biodiversity

- includes a large area of relatively undisturbed natural habitats/vegetation representative of at least some of the main vegetation type(s) of the province

Land

- land should be available on a 99-year lease to the SANSI or handed over to the SANBlstate
- current land owners are willing to lease or transfer the land

Education and Research

- easily accessible to educational and research institutions.

Appendix B: Priority Actions Linked to the Biodiversity Priority Areas Identified in the NSBA 2004

National biodiversity features, the reason for their identification and current and future pressures, based on the NSBA 2004, are summarised in the table below.

| National spatial feature | Reason for identification | Current and future pressures |
|--|---|--|
| Critically endangered and endangered river ecosystems | Ecological integrity of river ecosystems poor. | Over-abstraction, invasive alien species, loss of riparian habitat and poor land management in catchment. |
| Wetlands | Crucial for ecosystem services and regulation of water supply, provide resources for economic activities, and act as buffers during floods. | Development (residential properties, power lines etc), intensified land use e.g. overgrazing, and over-utilisation of resources |
| Critically endangered, endangered and less protected marine biozones | Biozones severely impacted primarily through extractive living resource use and mining. | Biggest pressure is from extractive marine living resource use (EMLRU). Other pressures include pollution, mining, coastal development, climate change, catchment degradation, non-extractive recreational activities, alien invasive species and mariculture. |
| Coastal environment | Concentration of threatened ecosystems, over exploitation of resources and flow reduction. | Coastal ribbon development including resorts and golf estates, development on estuaries. |
| Moist Grasslands | Very important for threatened habitats. | Cultivation, alien plant invasion, afforestation and habitat fragmentation. |
| Maputaland-Pondoland | Very important for threatened habitats, species of special concern and key areas for processes. | Afforestation, habitat fragmentation and urban expansion. |

| | | |
|------------------------------|--|---|
| Bushveld-Brakenveld | Important for threatened habitats, species of special concern and processes. | Alien plant invasion, urban expansion, cultivation, and mining. |
| Central Grasslands | Very important for threatened habitats. | Habitat fragmentation, cultivation, and mining. |
| North Eastern Escarpment | Very important for species of special concern and key area for processes. | Mining, urban expansion and afforestation. |
| Albany Ticket and Wild Coast | Important for threatened habitats, species of special concern and processes. | Alien plant invasion, habitat fragmentation and afforestation. |
| South Eastern Escarpment | Important for species of special concern and key area for processes. | Afforestation, cultivation and urban expansion. |
| Cape Floristic Region | Very important for threatened habitats, species of special concern and key area for processes. | Habitat fragmentation, urban expansion and afforestation. |
| Succulent Karoo | Very important for species of special concern. | Mining, afforestation and alien plant invasion. |

Appendix C: Set of Indicators to Monitor the Status and Trends of Species in South Africa

This set of indicators was derived from the outputs of a stakeholder workshop held on 23 and 24 January 2007 at SANSI in Pretoria. The draft set of indicators arising from the workshop is presented in Table 1 below.

TABLE 1: Draft list of indicators agreed at the workshop.

| Number | Indicator |
|--------|---|
| 1 | Breeding success |
| 2 | Degree of fragmentation of subpopulations |
| 3 | Distribution range of indigenous species |
| 4 | Genetic integrity of the population |
| 5 | Heterozygosity of important genes |
| 6 | Incidence of poisoning |
| 7 | Index of the harvested product e.g. size of bulbs, weight of fish etc. |
| 8 | Infection rates |
| 9 | Number of accidental mortalities, e.g. bycatch, roadkill, power line |
| 10 | Number of applications for permits |
| 11 | Number of individuals needing rehabilitation e.g. oil penguins |
| 12 | Number of mass population explosions |
| 13 | Percentage of original habitat lost |
| 14 | Phenological patterns |
| 15 | Population age / stage / state structure (where state includes sex ratio) |
| 16 | Population size indices |
| 17 | Proportion of habitat with no recruitment |
| 18 | Proportion of individuals that are diseased |
| 19 | Proportion of populations which are genetically pure |
| 20 | Proportion of the population harvested from the wild |
| 21 | Proportion of the species in the wild versus private hands. |
| 22 | Recruitment success |
| 23 | Toxin levels in filter feeders etc |

Subsequent to the workshop, a meeting was held between DEAT and SANSI to discuss the draft indicator set and decide on the final set. A number of indicators were removed from the draft set for various reasons. Table 2 below lists the indicators that were removed and the reason for their removal.

TABLE 2: Indicators removed from final set and the reason for which they were removed.

| Number | Indicator | Reason for removal |
|--------|--|---|
| 1 | Breeding success | This indicator is a duplicate of indicator number 22, Recruitment Success. |
| 5 | Heterozygosity of important genes | This indicator is highly costly and time consuming to measure and thus is not practical to implement for monitoring the status of species on national scale. |
| 6 | Incidence of poisoning | This indicator only gives an indication of the prevalence of poisoning, not in fact the resulting status of the species. |
| 8 | Infection rates | This indicator measures the infection rates as such and not the resulting status of the species. |
| 9 | Number of accidental mortalities, e.g. bycatch, roadkill, power line | This indicator measures the number of deaths due to the various causes and not the resulting status of the species. |
| 10 | Number of applications for permits | This indicator measures the number of permit applications and not the resulting status of the species. This aspect is captured in the National Monitoring & Reporting framework in the Responses section. |
| 11 | Number of individuals needing rehabilitation e.g. oil penguins | This indicator measures how many individuals required rehabilitation and not the resulting status of the species. |
| 12 | Number of mass population explosions | This is not an indicator of the status of a species. However, such aspects are covered in the national monitoring and reporting framework under the climate change section. |
| 14 | Phenological patterns | This is not an indicator of the status of a species. However, such aspects are covered in the national monitoring and reporting framework under the climate change section. |

| | | |
|----|---|--|
| 17 | Proportion of habitat with no recruitment | It is very difficult to identify which areas of habitat do not have recruitment occurring in them. Furthermore, many populations naturally have sink areas where recruitment does not occur. Thus, it would be problematic as an indicator because it is almost impossible to distinguish between natural sink areas and areas which no longer have recruitment due to anthropogenic influences. |
| 18 | Proportion of individuals that are diseased | This indicator measures the number of individuals which are diseased, not the resulting overall status of the population. |
| 23 | Toxin levels in filter feeders etc | This is an indicator of pollution, not the resulting status of the affected species. |

The remaining indicators were then grouped under headings denoting the aspects of the population which they measure. Some of the indicators were identified to indeed be aspects / headings not indicators. The resulting final set of indicators is given in Table 3 below.

TABLE 3: Final set of indicators

| Aspect to be monitored | Indicators |
|--|---|
| Population growth and decline | Population size |
| Population age / stage / state structure | Recruitment success (fecundity) |
| | Sex ratio |
| | Proportion of the population in each or a selected age / state class |
| | Index of the harvested product e.g. size of bulbs, weight of fish etc. |
| Distribution Range | Percentage of original habitat lost |
| | Fragmentation index for remaining suitable habitat versus that of original extent of suitable habitat |
| | Proportion of the population on privately-owned land and state land |
| Genetic integrity of the population | Proportion of the population which is genetically pure |