SWAZILAND'S FOURTH NATIONAL REPORT TO THE CONVENTION ON BIOLOGICAL DIVERSITY

The Swaziland Environment Authority

Ministry of Tourism and Environmental Affairs

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Preface

Swaziland's Fourth National Report to the Convention on Biological Diversity has been prepared in accordance with Article 26 of the Convention and COP decision VIII/14, whereby parties are required to submit their fourth national reports by 30 March 2009. The structure of the report is based on the Guidelines for the Fourth National Report published by the Convention.

The report was prepared with input from relevant stakeholders through interviews, a workshop and written inputs on a draft of the report (see Appendix I for further information on the preparation of the report).

Thanks go to all those who contributed.

Executive Summary

1. Introduction

The Convention on Biological Diversity (CBD) opened for signature at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992. It came into force on 29 December 1993 and currently has 191 Parties. Swaziland ratified the convention on 9th September 1994. The principal objectives of the Convention are:

- the conservation and sustainable use of biological diversity, and
- the fair and equitable sharing of benefits arising from its utilisation.

The Convention translates its guiding objectives of conservation, sustainable use and equitable sharing of benefits into binding commitments in its articles, and there are seven thematic programmes of work and several cross-cutting issues that parties are required to implement. Parties have also adopted the Strategic Plan of the CBD whereby they have committed themselves to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth. This target was subsequently endorsed by the World Summit on Sustainable Development.

Swaziland became a signatory to the CBD in 1994. The Fourth National Report has been prepared in compliance with the reporting requirements under the CBD, to provide an assessment of the status, trends and threats relating to Swaziland's biodiversity, and to report on the actions, progress in implementation, obstacles encountered and future priorities for the country's biodiversity.

The Fourth National Report (4NR) to the Conference of Parties (COP) has been prepared in accordance with Article 26 of the Convention on Biological Diversity which requires Parties to prepare periodic reports of the measures taken to implement the provisions of the CBD and their effectiveness.

2. Overall status, trends and threats to biodiversity

Since becoming a Contracting Party to the Convention on Biological Diversity (CBD), notable milestones Swaziland has achieved has included:

- Signed and ratified the Convention of Biological Diversity (CBD)
- Prepared a National Biodiversity Strategy and Action Plan (NBSAP) – now under revision
- Acceded to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on 24 Jan 1997.
- Formulated a National Environment Action Plan (1997)
- Formulated a Forest Policy (2000), a National Forestry Programme (2002) and Forestry Bill (2008).
- Promulgated a new Flora Protection Act (2000)
- Established a Biodiversity Implementation Programme Committee (1997) to oversee the implementation of the CBD and its related activities
- Gazetted the Environmental Management Act (2002) and established the Swaziland Environment Fund (2004)
- Gazetted revised Environmental Audit, Assessment and Review Regulations (2000)
- Gazetted the Water Act (2003) and prepared an Integrated Water Resources Master Plan (2008)
- Strengthened the National Plant Genetic Resources Centre and National Herbarium
- Carried out a study to identify protection worthy areas with the view to declare them protected (2001)
- Established three Transfrontier Conservation Area (TFCA) focusing on a eco-system wide management approach in areas of highly significant biodiversity shared by Swaziland, Mozambique and South Africa
- Established the country's first Community Based Conservation Management area in Shewula and prepared a Community Nature Reserve Conservation Strategy (2007)
- Initiated the formulation of a national biosafety framework and drafted the Biosafety Bill (2008)
- Prepared the Access and Benefit Sharing Bill (2008) which is being circulated for comment
- Carried out a Farm Animals Genetic Resources Survey
- Carried out a Fisheries Survey in 2002 to prepare an inventory of fish species in the major rivers
- Prepared a Tree Atlas of Swaziland (Loffler, L. & Loffler, P. 2005)
- Prepared an Annotated Checklist of the Trees of the Lubombo Conservancy (Loffler, L. & Braun, K. 2009)
- Initiated an Invasive Alien Plant survey followed by an eradication campaign and preparation of an Invasive Alien Plant Strategy (2009)

- Restructured the Swaziland National Trust Commission to incorporate new forms of protected areas according to IUCN categories
- SNTC working with private sector conservancies to formalize and gazette these areas under the SNTC Act

Status and Trends

Various components of Swaziland's biodiversity have been inventoried and researched over the past few decades. Most of this work has been aimed at producing checklists and atlases, which document presence and distribution of species, respectively. Recently work has also been conducted on mapping ecosystems and vegetation types. The four ecosystems are:

1. Montane grasslands
2. Savanna-woodland mosaic
3. Forests
4. Aquatic systems

The area covered by each of these ecosystems varies greatly with aquatic and forest ecosystems accounting for just 6% of Swaziland's total area. The savanna ecosystem has the greatest area under protection (5%), while just 2% of each of the other three ecosystems is currently protected.

Despite the small size of the country, Swaziland has an impressive list of endemic species. A total of 20 endemic plants are listed for Swaziland or suspected to be endemic. The highest species richness of endemic plants (accounting for 60% of endemic species) lies within montane grasslands around Mbabane and Malolotja Nature Reserve in the north-western part of the country. The northern parts of the Lubombo's support a smaller proportion of endemics, with a small number of species scattered around the country.

Natural processes, e.g. erosion, and human activities, i.e. agriculture, forest plantations, and human settlements, are causing a decrease in the diversity and distribution of Swaziland's natural flora and fauna. Large-scale irrigated agriculture, particularly monoculture agriculture such as sugar cane, pineapple and citrus production has resulted in clearing of large tracts of land and destruction of the natural vegetation. This in turn, results in loss of the animals which depend on it.

Ever increasing poverty, particularly in the rural areas, is resulting in the rapid degradation of these resources in a vicious cycle of declining availability of these hitherto free resources. This combined with recurrent drought, is resulting in a heavily degraded natural environment that responsible agencies are battling to address in light of higher national priorities.

Land degradation, fragmentation of habitats, alien plant invasions and rapid degradation of the biological resources are the key challenges to be addressed by the country. The various policy and legislative initiatives launched by government since Rio have so far remained mostly on paper, are not cross-sectoral or integrated and most importantly are not matched by adequate funding and expertise to implement the measures recommended by stakeholders. Swaziland's classification as a lower-middle income country has contributed to the difficulty in accessing donor funding for conservation and environmental management.

Despite these challenges, Swaziland does support a diverse assemblage of habitats which are home to a wide range of organisms. Although the information base on Swaziland's biodiversity is still incomplete, survey work has shown that a significant portion of southern Africa's plant and animal species occur here. The eastern region of Swaziland, for example, forms part of the Maputaland Centre of Plant Diversity (one of the World's hotspots of floral, as well as faunal, species richness and endemism), while the western region falls within two areas of global significance, the Drakensberg Escarpment Endemic Bird Area and the Barberton Centre of Plant Endemism. The value of Swaziland's biodiversity has long been recognised by Swazis who make use of it on a daily basis for various reasons including: traditional medicine, food, building material and traditional attire. Traditional systems of conserving biodiversity also exist but have not been documented and are currently being eroded.

Recent studies have been conducted on components of Swaziland's biodiversity that address certain articles of the Convention on Biological Diversity (CBD). Recent publications include, *inter alia*, a Flora Red Data List (2002), a vertebrate Red Data Book (2003), a Swaziland Fish and Fisheries Survey (2004), a Swaziland Tree Atlas (2005), a revised and updated Vegetation Map (2004), and map of the distribution of some raptor nests (2005). Not only do these publications demonstrate Swaziland's commitment to the CBD, but also provide valuable baseline information which could be used to make wise and sensible conservation- and environmentally-related decisions. The value of these resources needs to be acknowledged and put to good use. However, the

country should not lose sight of the fact that the majority of its biodiversity components have yet to be surveyed, even on a superficial level.

Although numerous actual and potential threats to Swaziland's biodiversity exist, a comprehensive study of these threats and their impact is missing. Regional threats include factors such as atmospheric and water pollution, reductions of flow in rivers that have their sources in South Africa, cross-border smuggling of organisms and the increasing spread of alien invasive plant species from neighbouring countries. Local threats to Swaziland's biodiversity can be grouped into the following categories: 1) those that destroy or alter the habitat, 2) over-exploitation, 3) the impact of exotic species, 4) weak law enforcement, 5) i inadequate awareness of value of resources, 6) population growth, 7) lack of equity in ownership and management of biodiversity and 8) climate change.

Threats

Relative importance of different types of anthropogenic threats on terrestrial, freshwater, estuarine and marine ecosystems in Swaziland are presented in the following table:

	Terrestrial	Freshwater
Habitat loss and degradation	XXX	XX
Flow modification	X	XXX
Invasive alien species, hybridisation and GMOs	XXX	XXX
Over-harvesting	XX	X
Pollution	X	XX
Climate change	XXX	XXX
Law enforcement	XX	XX
Lack of equity in ownership and management of biodiversity	XXX	XX

Many species in Swaziland have declining populations, some of which have already gone extinct, such as the African wild dog (*Lycaon pictus*). A total of 132 species of vertebrates are listed in this book, consisting of 11 species of fish, 4 species of amphibians, 14 species of reptiles, 55 species of birds and 48 species of mammals (Table 4). These threatened species represent between 9-20% of the total numbers of fishes, amphibians, reptiles and birds occurring in Swaziland, but a significant 38% of the mammalian fauna. The table below presents a summary of the number of vertebrates in each threat category. Values in brackets represent the percentage of the total indigenous fauna occurring in Swaziland.

	Number of species				
Threat category	**Fishes**	**Amphibians**	**Reptiles**	**Birds**	**Mammals**
Regionally Extinct	0	1 (2%)	0	7 (1%)	3 (1%)
Critically endangered	3	0	0	1	0
Endangered	1	0	0	12	3
Vulnerable	2	0	2	14	6
Sub-total (threatened)	6 (10%)	0	2 (2%)	27 (5%)	9 (7%)
Sub-total (others)	5	3	12	21	36
Total	**11 (18%)**	**4 (9%)**	**14 (13%)**	**55 (11%)**	**48 (37%)**

The global targets of restoring and maintaining populations of declining species, and improving the status of threatened species (Goal 2) have not been met. As can be seen from the results presented above, populations of many species are still in decline, and several species have gone extinct in the past few decades. The NBSAP calls for the protection of threatened and endemic species. A first step in this process is the identification of threatened species. To this end, Red Data Lists have been prepared for two groups of organisms: vertebrates and higher plants.

Implications of biodiversity loss

The loss and degradation of Swaziland's biodiversity has serious implications for its society and economy. Natural ecosystems provide many essential services such as the provision of clean water and air, prevention of soil erosion, pollination of crops, provision of medicinal plants, nutrient cycling, provision of food and shelter and the meeting of spiritual, cultural, aesthetic and recreational needs. Large portions of the country's economy are heavily dependent on biodiversity including livestock ranching, horticulture and agriculture, commercial and subsistence use of medicinal plants, and ecotourism. The majority of Swazis are highly

dependent on natural resources for their livelihoods, a situation which has been greatly aggravated by the HIV AIDS crisis, the declining economy and increased unemployment.

In addition, intact ecosystems (i.e. ecosystems which are in a natural or near-natural state) are likely to play an important role in providing cost-effective resilience to the impacts of climate change, including buffering human settlements and activities from the impacts of extreme climate events.

The overall socio-economic well-being of the people of Swaziland is dependent on the achievement of a balance between development and conservation which involves the sustainable use of its biodiversity. Continued loss of biodiversity and ecosystem health is likely to have dire social and economic consequences. It is thus essential that the socio-economic role of ecosystems is recognised and integrated into all kinds of decision-making.

In this context it is important to recognize that Swaziland is a very small country, with a very limited natural resource base. The severe impact of the HIV and AIDS crisis makes its population ever more dependent on these resources. The recent reported decline in population growth has limited the impact of this dependence, but this is only in the short term. Improved health care and awareness will lead Swaziland back to normal population growth, which in turn will create severe pressures on its natural resource base. Swaziland's small size should be taken as a great opportunity for effective land use planning and natural resource management.

3. Key actions supporting CBD objectives

To support its obligations under the CBD and the achievement of its objectives, Swaziland has expended considerable effort in developing an overarching policy and legislative framework for biodiversity management and its sustainable use, in support of the development agenda of the country. As a developing country Swaziland has many socio-economic priorities, including providing education, health, housing and other basic social services, that detracts resources away from biodiversity management.

The policy and legislative framework for biodiversity management has been established to support the CBD.

A large amount of fragmented legislation pertaining to biodiversity exists in the country, most of which is housed in the Ministry of Tourism and Environmental Affairs and the Ministry of Agriculture. Much of this legislation is outdated and many gaps and overlaps were identified. Major gaps in the legislation include the absence of a Land Policy (still in draft since 1999 but reportedly being reviewed), the lack of support for sustainable utilization of biological resources on Swazi Nation Land, and the lack of an umbrella Act that integrates the fragmented legislation. Work is on-going in the development of a Biodiversity Management and Conservation Bill that intends to pull all biodiversity related legislation under one comprehensive Act. Other gaps include insufficient protection of threatened species and aquatic systems, and inadequate support for *ex situ* conservation and control of alien invasive organisms.

To address the problems associated with the country's legislation, an all-encompassing Biodiversity Management Policy and Act is being developed. This would have the effect of integrating existing relevant legislation into one and clearly define the roles of various key institutions. Furthermore, the Act would have the authority to develop new and relevant regulations.

Cooperation

Article 5 calls for international cooperation. The General Trans-frontier Conservation and Resource Area Protocol was signed between the Kingdom of Swaziland, Republic of South Africa and Republic of Mozambique, and on 22 June 2000 establishing the Lubombo TFCA. The Lubombo Conservancy-Goba Trans-frontier Conservation Area Protocol between the Governments of the Republic of Mozambique and the Kingdom of Swaziland was also signed in June 2000. A Bilateral Lubombo Conservancy-Goba TFCA Task Group was established.

Swaziland participates in the Southern African Biodiversity Support Programme of the SADC which seeks to co-ordinate the work of the national biodiversity programmes of SADC member states. Furthermore; Swaziland participates on the Southern African Botanical Network (SABONET), and the SAFRINET technical support network of BioNET International.

Therefore, in general Swaziland enjoys bilateral and regional cooperation from her neighbours on issues shared by these states. The cooperation to date has been very helpful and rewarding to the country. However, in the area of trans-frontier conservation and inter-state cooperation, the pace of implementation has been slow, as

Swaziland's trans-frontier neighbours (South Africa and Mozambique) have tended to focus on the larger, more high-profile initiatives. Swaziland needs to be very proactive in pushing its trans-frontier agenda.

General measures for conservation

Article 6 of the CBD calls for the putting in place of general measures for conservation and sustainable use. Swaziland's NBSAP was drafted in 2001 and issued as a practical working document. In addition the country prepared the Swaziland Environment Action Plan (1997), a National Environment Policy (2000), a National Action Program of the Convention to Combat Desertification (2001), a National Forest Policy (2002), a National Forestry Programme (2002) and the Comprehensive Agriculture Sector Policy (2005). All these plans and policies broadly share the common objectives of the CBD. Hence, Swaziland has made good progress with regards to the development of appropriate action plans and policies for the conservation of biological diversity.

However, the benefits of these policies and programmes are seriously undermined by lack of progress with the Land Policy which was drafted in 1999 and is currently under review. The policy was designed to improve access to land and secure tenure for all citizens; to encourage the optimal, rational and sustainable use of land; improve productivity, income and living conditions of Swazis especially the poor and to develop an efficient and effective system of land administration. Without the Land Policy in place, the country will lack both incentives for sustainable land use and means for implementing sustainable land management.

Sustainable use and community-based natural resource management

Article 10 calls for the development of components of biological diversity. Swaziland has adopted legal measures for the minimization of adverse impacts on biological resources through the enforcement of environmental impact assessments for any new developments. Swaziland has used the Community Based Natural Resource Management (CBNRM) system as a mechanism to involve the private sector and indigenous/local communities in biodiversity conservation. Shewula Nature Reserve serves as an example where local communities are involved in the development of a protected area adjoining an already existing protected area. A second Communiity Biodiversity Conservation and Tourism Development project is at an advance stage of development at Emvembili in the north of the country. This project is trying to make communities in Protection Worthy Areas realise the benefit of keeping those areas intact in terms of engaging income generating programmes like eco-Tourism. The government of Swaziland has been instrumental in ensuring success of this project. In 2007 a Conservation Strategy was prepared to assist the community conserve and cooperatively manage the reserves natural resources to ensure sustainable use and flow of benefits.

The national Forest Policy (2002) and Action Programme encourages community based resource management of natural resources through the formation of Natural Resource Management Committees at community level. Proactive advocacy with local traditional leaders and community members is an ongoing initiative led by the Forestry Section of the Ministry of Agriculture.

With regard to tourism, Swaziland has adopted legal measures for the assessment of impacts on biological resources by tourism activities through the enforcement of environmental impact assessments for any new developments and projects related to tourism.

Swaziland has also supported capacity-building activities to assist local communities in planning tourism developments. For example, the Swaziland Tourism Authority with financial support of the EU has assisted a local community in establishing two tourist lodges in the Ngwempisi Gorge also Mahamba in western Swaziland and is still preparing programmes with the support of the EU to capacitate local communities in developing tourism projects.

4. Progress on national implementation

This 4NR and the previous 3NR have both highlighted that the sustainable management and utilisation of the country's biodiversity is at a critical crossroads. With the extreme pressures being faced by the natural environment by socio-economic and physical pressures, priority areas for intervention can be identified.

It is important to note that the window of opportunity represented by the 'critical cross-roads' is narrowing rapidly. Swaziland is a small country characterized by a major *threat* of unsustainable natural resource depletion and a major *opportunity* of being able to plan and manage its land and natural resources with the right policies and systems. Increasing poverty and a major health crisis have put the environmental agenda on

the back-burner, but without a proactive approach at this stage, the environment-poverty nexus could lead to a downward spiral increasingly difficult to address.

Challenges to be faced include strengthening the political will and support for biodiversity conservation and management across all sectors of the economy and society. It is only with strong political will that the required resources can be accessed. Much work is needed to educate and inform our political leaders on the importance of biodiversity for sustainable development.

Limited public participation and stakeholder involvement in biodiversity issues remains a major obstacle. Participation and informed involvement in biodiversity management decisions remains only at the higher scientific level. The general population and main users of biodiversity, have still to be given the opportunity to effectively participate in managing the nation's biodiversity for the benefit of all.

A critical challenge still remains in integrating biodiversity issues into all sectors of government and society. The lack of mainstreaming and integration of biodiversity issues into the activities of all sectors is resulting in two steps forward and one step back as initiatives to better manage and protect biodiversity are negated by poorly planned large scale developments.

With the country's limited integration of biodiversity, precautionary and proactive measures that might help enhance efforts to improve the management of biodiversity are being hampered by a general lack of awareness of the longer term impacts of decisions made today.

Several studies have identified that the country has inadequate capacity to act which in turn is caused by institutional weakness and insufficient funds.

Traditional knowledge in biodiversity management, though high in the early days of Swaziland's history, is being lost or undermined as the nation's culture and traditions are lost or weakened. The HIV AIDS epidemic is removing the persons with this knowledge at alarming rates. Consequently, the time honoured and respected practices that worked with nature are being replaced by overexploitation and poor management.

The challenge of scientific research capacities to support biodiversity management is still a major one. The scientific cadre is limited in both numbers and skills. National resources for research are extremely limited as decision-makers, through poorly informed judgement, do not advocate for the necessary resources to study key components of the nation's biodiversity and its interaction with society.

The loss of biodiversity and the corresponding goods and services it provides are not properly understood and documented. Given the importance of the nation's natural resources for its economic and social development, government is failing to recognise the value and importance of the goods and services the ecosystems provide. Water, a critical element of the economically important irrigated agriculture sector, rises in the Highveld region of the country. The degradation of this important catchment through mismanagement and poor decision-making is already having noticeable effects downstream as irrigators struggle to abstract sufficient water for their industry. Dams built to store water are themselves being impacted as erosion and sedimentation reduce their holding capacities.

To ensure the integrity and productivity of ecosystems, the local communities that reside in these critical areas need to be supported and rewarded to practice more sustainable land use practices. The general lack of capacities for local communities to make informed decisions on biodiversity management, often results in the further erosion of biodiversity and critical ecosystems. Under the Forestry Policy, natural resource management committees are to be setup. These committees, according to the policy, will be supported by government and development partners and empowered to improve their decision-making processes.

Natural disasters and environmental change are affecting the majority of the sub-region and Swaziland in particular. Drought has been the major type of natural disaster affecting the country over the past 10 years. These droughts have left the natural environment stressed and unable to provide the goods and services it once did. However, the goods and services are still being demanded by the population thus the natural environment is rapidly degrading to a point where it may not be able to recover. Climate change is also beginning to have a noticeable impact on ecosystem function and services and this is likely to deteriorate even further in the coming years.

5. Major obstacles in implementation

As outlined above, substantial progress has been made in implementing the Swaziland's commitments to the CBD. Nevertheless challenges remain. There are many examples of where Swaziland is falling short of its targets.

In spite of the progress made in establishing a coherent policy and legal framework for biodiversity conservation (a continuing process), there remains an under-appreciation among key decision-makers, both in government and the private sector, of the important role of biodiversity in the economy and for society at large. The sector needs to find ways of communicating its message more effectively.

Financial resources to implement priority activities are an ongoing challenge – national government support and allocation of budget to organs of state with biodiversity responsibilities is critical, as is external support from sources such as the Global Environment Facility, the UNDP and (potentially) the Critical Ecosystem Partnership Fund – without this support, the bioregional programmes would not have been able to progress as they have done.

6. Future priorities

Alien invasive species

Invasive species are spreading at an alarming rate throughout Swaziland. Grazing for both wildlife and livestock are threatened by these weeds as is our biodiversity. Management of these invasives is going to be a costly and timely exercise and will need whole-hearted support and cooperation by government, the private sector and neighbouring countries.

Fragmentation of ecosystems

A specific trend that needs urgent attention with regards the conversion of land to sugar cane is the fragmentation of the Lowveld ecosystem. This is a phenomenon associated with the proliferation of irrigation schemes and requires attention at national and sub-continental levels. The destruction of vegetation through these schemes has contributed to the gradual diminution of Lowveld Woodland areas. More and more areas of bushveld are being destroyed, with the risk that fragmentation will spread to the point where any remaining woodland is isolated in small pockets, eventually resulting in non-viable habitats.

Biodiversity conservation options for communal management

The lack of awareness of the importance and role of indigenous forests and woodlands in people's daily lives stipulates the need for intensive research and education programmes in the country. Management of any resource requires appropriate research, education and training in order to develop the necessary experience and expertise to make wise decisions. The generation of income from the sustainable use of the country's biodiversity will have to become the major economic engine for supporting conservation action in communal areas. This will have to be implemented through a proposed Natural Resource Accounting system.

Water Catchment Management

Swaziland is aware of the importance of water catchment management and has formed five River Basin Authorities for each of the major catchments. However, this work is only at the most nascent stage and major challenges remain. The vast majority of the land falls under Swazi Nation Land (SNL) where a 'tragedy of the commons' situation generally occurs, leading to over-grazing and deforestation, which have major impacts on soil and water quality. All catchments are affected by large industrial timber plantations in the upper reaches which have a notable impact on water flows from these upper catchment areas. The proliferation of bore-holes and wells in drought prone areas is also a cause of concern, although the new Directorate of Water Affairs is making efforts to improve regulation and planning. The RBAs have the mandate to implement the Integrated Water Resources Management Plan which contains several strategies to manage biodiversity in terms of the boarder catchment management.

Landscape Management

Research undertaken by the Swaziland Tourism Authority (STA) indicated that a high percentage of international tourists are attracted to Swaziland because of its scenic beauty. This important finding has not been translated into any clear strategy for protecting Swaziland's tourism product. However, the protection of Swaziland's important landscapes clearly offers a win-win situation for both tourism and biodiversity and should be pursued as an important sustainable development strategy for the country. The most important

tourism landscapes are largely consistent with those that provide the greatest biodiversity, such as the Lubombo escarpment and the Makhonjwa Mountains. These landscapes are also key elements in the country's transfrontier conservation program. Management of most of the mountain and landscapes for its tourism and biodiversity values should form part of an integrated approach incorporating the River Basin Authorities.

Natural Resource Accounting

The economic, environmental and social gains and losses resulting from the conversion of land are not corrected for in the current system of National Income Accounting (NIA). A careful investigation needs to be made into the way contributions of agricultural production to GDP are currently calculated, so as to provide an improved estimate. The NIA system for Swaziland should include Natural Resource Accounting (NRA). It is not easy to place monetary values to the value of biodiversity, but Natural Resource Accounting provides a means of doing so. According to the Natural Resource Accounting in Southern Africa, sustainable development (to which Swaziland is committed, as reflected in the NDS and other policy documents) is concerned with the question of whether current actions augment or reduce the opportunities (i.e. economical, ecological and social) that future generations face as a result of decisions made in the present. Given the close linkages in economic activity and environmental change, development indicators should integrate the economy and the environment more closely. To reflect the natural resources' contribution to the overall economic development process and careful consideration of their sustainability, it is crucial for Swaziland to introduce Natural Resource Accounting in to the NIA system. Upon adopting this global initiative, it is envisaged that all economic development initiatives would encourage the sustainability of the natural environment. Though the priority factor is land management in Swaziland, for capacity building, the current target is water accounting through the SADC water accounting program. Other factors of importance include the forest and livestock/wildlife accounts. There is therefore a strong argument for Swaziland to introduce Natural Resource Accounting in the NIA system.

Legislative development

Legislation dealing with land and livestock in Swaziland need to be urgently updated and enforced as it influences biodiversity immeasurably. The Swaziland Flora Protection Act (2000) which provides legal protection for over 200 plant species in the country needs its Schedules to be regularly revised. In addition, the Plant Control Act (1981) which provides for the control, movement and growing of plants incorporating the protection of land from noxious weeds needs to be urgently updated. A new list of noxious weeds needs to be drafted and the Act amended accordingly.

To better protect existing wetlands and their unique ecosystem, the country is in the process of acceding to the Ramsar Convention on Wetlands and the Conservation of Migratory Species of Wild Animals both of which are viewed by local conservationists as critical to the protection and management of Swaziland's threatened biodiversity.

Lack of control of the medicinal plant trade

The quantity and type of indigenous plant products that are sold to markets, inside and outside of Swaziland, for medicine are largely undocumented in the country. Where the species are harvested from and how they are harvested needs to be quantified and justified. This illegal trade is not monitored in Swaziland and the species that are sold are in many cases not harvested sustainably. Extinctions of species could occur in the immediate future if this trade is not formalised and regulated.

In-situ conservation of genetic resources

Indigenous species that are threatened for various reasons are not being propagated and very few are monitored effectively. Large tracts of land have been cleared and are presently earmarked for agricultural expansion and have had large numbers of indigenous species removed or destroyed. Unfortunately, there is still no formal institution that acts as refugia for the important species or that offers the education facility that is needed for children to help them appreciate what biodiversity in Swaziland has to offer and its management there-of. The Swaziland National Trust Commission reserves which are managed with a view to protecting the flora (unlike the game reserves) fulfil an important role with regard to *in situ* conservation of genetic resources.

Capacity building

To effectively implement the Convention, the country has identified priority needs through the National Capacity Self Assessment process which was completed in 2005. The NCSA culminated in the preparation of a

Capacity Development Action Plan that proposes an integrated capacity development process in order to fulfil the country's capacity requirements to implement the Multilateral Environmental Agreements the country has signed.

7. Conclusion

Swaziland continues to make some progress in conserving and managing her biological resources. However, a lack of resources and conflicting land use and the cumulative impact of poverty and climate change are combining to slow effective management and conservation.

Regional cooperation is assisting Swaziland manage and promote her biological and landscape resources with notable increases in tourist visits.

The country lacks a forum at which all those involved in biodiversity management and conservation can meet and discuss issues, projects and developments. The CDB Focal Point is investigating how such a forum can be established. An annual Biodiversity Conference is already planned as a first step.

The Biodiversity Strategy and Action Plan needs to be revised but plans are in place to review and update it as part of the finalisation of the Biodiversity Management and Conservation Bill and Policy.

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1 OVERVIEW OF STATUS, TRENDS AND THREATS

1.1 INTRODUCTION

Swaziland lies between latitudes 25° and 28° south and 31° and 32° east in the south-eastern part of Africa. The country is landlocked and covers an area of 17364 km^2. It is bounded by South Africa in the north, west and south, and by Mozambique in the east. Although Swaziland is small in size, it has great variation in landscape, geology and climate.

Swaziland is located between the South African plateau (reaching over 1800 metres) and the coastal plains of Mozambique. Thus the western part of the country lies in the escarpment area, and the eastern part in the zone of the coastal plains. Separating Swaziland from the Mozambique coastal plains, is the Lubombo Mountain Range.

With its divergent geology, climate and subsequent landforms, the physiographic regions within the country's boundaries are very distinct. Although the country has historically been divided into four regions (Highveld, Middleveld, Lowveld, and Lubombo), it has now been more appropriately reclassified into six physiographic zones, taking into account elevation, landforms and geology (Remmelzvaal, 1993). These six zones are: Highveld, Upper Middleveld, Lower Middleveld, Western Lowveld, Eastern Lowveld and Lubombo Range.

Swaziland, despite its small size, supports a diverse assemblage of habitats which are home to a wide range of organisms. Although the information base on Swaziland's biodiversity is still incomplete, survey work has shown that a significant portion of southern Africa's plant and animal species occur here. The eastern region of Swaziland, for example, forms part of the Maputaland Centre of Plant Diversity (one of the World's "hotspots" of floral, as well as faunal, species richness and endemism), while the western region falls within two areas of global significance, the Drakensberg Escarpment Endemic Bird Area and the Barberton Centre of Plant Endemism. The value of Swaziland's biodiversity has long been recognised by Swazis who make use of it on a daily basis for various reasons including: traditional medicine, food, building material, traditional attire. Traditional systems of conserving biodiversity also exist but have not been documented and are currently being eroded.

1.2 SWAZILAND'S RICH BIODIVERSITY

There is a general failing by society to recognise value when it is not overtly expressed in monetary terms, when it cannot be owned, and when there is little understanding of the benefits being enjoyed. Biodiversity is often undervalued due to the lack of markets, institutions and information regarding biodiversity's services. This frequently results in inappropriate decisions being taken regarding the use of biodiversity or decisions are taken which compromise Swaziland's biodiversity.

In order to ensure the sustainable use of biodiversity, societal resources must be allocated to management, or services which biodiversity could supply in the short term will be lost. Clearly, there is a need to demonstrate the value of biodiversity to promote the sustainable utilisation of biodiversity. A first step in demonstrating value is defining the goods and services provided by biodiversity.

1.2.1 GOODS AND SERVICES SUPPLIED BY BIODIVERSITY IN SWAZILAND

For the sake of simplicity, biodiversity is often broken into three components: genetic diversity, species diversity and ecosystem diversity. The above three components of biodiversity, integrated with the physical environment, generate a wide range of critical goods and services for humanity. In a country like Swaziland, where a large percentage of the community rely heavily on the natural resources directly for home consumption (fuel wood, house building materials, etc) and for economic production (cattle farming, crop farming, etc), the dependence on ecosystem services and the associated biodiversity is critical.

The services supplied by biodiversity in contributing to, and in association with, functional ecosystems, provide Swazi society with a wide range of goods and services (Table 1). These services can generate a range of benefits for the Swaziland community and are used in a number of ways, including:

- Direct use, where goods such as plants are consumed or used in industrial production,
- Indirect use, where services such as the ability of wetlands to reduce flood damage (due to indigenous plant cover) make a cost savings to communities,

- Option use, where resources such as attractive indigenous forests and birds can be used to promote tourism growth in the future, and
- Existence use, where the existence of a resource, such as a forest, may give certain communities a feeling of well-being because ancestors are buried there.

Table 1: Goods and services supplied by biodiversity

Goods and services	Functions	Examples
Gas regulation	Regulation of chemical composition of the atmosphere	Carbon sequestration, Oxygen and ozone production,
Climate regulation	Regulation of temperatures, precipitation at local levels	Urban heat amelioration, cloud formation, wind regulation,
Disturbance regulation	Regulation of episodic and large environmental fluctuations on ecosystem functioning	Flood control, drought recovery, refuges from disease, pollution events,
Water regulation	Regulation of water flow	Capture and gradual release of water by vegetation for agricultural, industrial and household use
Water supply	Storage and retention of water	Supply of water by watersheds, reservoirs and rivers
Erosion control	Retention of soil within an ecosystem	Prevention of soil loss by vegetation cover, and by capturing soil in wetlands
Soil formation	Soil formation processes	Weathering of rock by water and accumulation of organic material in woodlands
Nutrient cycling	Storage, recycling, capture and processing of nutrients	Nitrogen fixation, nitrogen cycling through food chains
Waste treatment	Recovery of nutrients, removal and breakdown of excess nutrients	Breaking down of waste, detoxifying pollution
Pollination	Movement of floral gametes	Supply of pollinators for plant reproduction, including insects, birds and rodents
Biological control	Regulation of animal and plant populations	Predator control of prey species, predator control of herbivores - rodent control, insect control, bats control
Refugia	Habitat for resident and migratory populations	Nurseries, habitat for migratory birds, regional habitats for species
Food production	Primary production for food from indigenous species	Production of fish, bush meat, crops, fruit, by non-commercial farming
Raw materials	Primary production for raw materials	Production of fuel, craftwork materials, house building materials, stock fodder, fencing materials
Genetic resources	Unique biological materials and products	Genes for resistance to plant diseases, ornamental species, plant medicines, fibres
Recreation	Providing opportunities for recreation activities	Ecotourism, sport fishing, outdoor recreation activities
Cultural	Providing opportunities for non-commercial uses	Aesthetic, educational, spiritual, intrinsic and scientific values of ecosystems

Adapted from Mander (1998)

It is important to note that a wide range of the above services are not consumed as goods (such a medicine or fuel wood) but are services supplied to the wider community (such as pollination, erosion control and flood control). Many of these services, for example, disturbance regulation and genetic resources, will play a critical role in supplying the Swaziland community with future options.

1.2.2 STATUS OF BIODIVERSITY IN SWAZILAND

Various components of Swaziland's biodiversity have been inventoried and researched over the past few decades. Most of this work has been aimed at producing checklists and atlases, which document presence and distribution of species, respectively. Recently work has also been conducted on mapping ecosystems and vegetation types.

1.2.2.1 ECOSYSTEMS

During the development of the National Biodiversity Strategy and Action Plan (NBSAP), the importance of taking an ecosystem approach for the successful conservation of biodiversity was recognised and an ecosystem map for Swaziland was drafted. This map, for the first time, shows ecosystems as opposed to geographical regions or vegetation types. The four ecosystems are: (see Figure 1):

1) Montane grasslands
2) Savanna-woodland mosaic
3) Forests
4) Aquatic systems

The justification for these four ecosystems is as follows. An ecosystem comprises a distinct biological community together with (and often shaped by) its associated physical environment. An ecosystem is, therefore, a functional unit which is distinct from other ecosystems in both its species composition and the ecological processes driving that ecosystem.

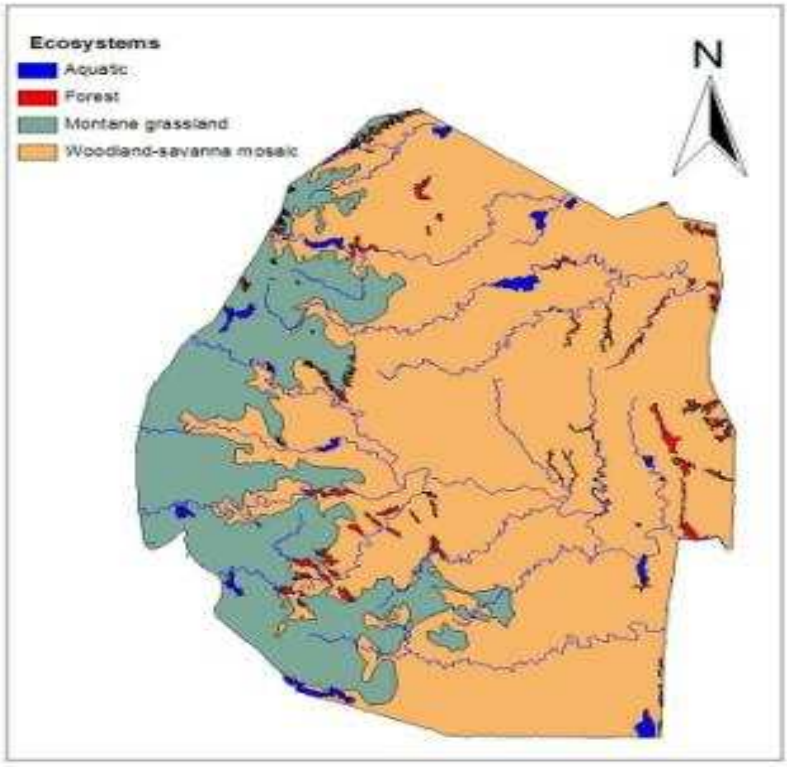


Figure 1: Map of Swaziland showing the four ecosystems developed and adopted by the NBSAP

The area covered by each of these ecosystems varies greatly with aquatic and forest ecosystems accounting for just 6% of Swaziland's total area. The savanna ecosystem has the greatest area under protection (5%), while just 2% of each of the other three ecosystems is currently protected.

Plants and animals are not uniformly distributed across the four ecosystems. The distribution of vertebrates in relation to these ecosystems has been studied (Monadjem *et al.* 2003a) and can be used as an example. The savanna ecosystem supports the highest number of species, followed by montane grassland, aquatic ecosystem and lastly forest (Table 2). Furthermore, species composition varies greatly between ecosystems. Poynton & Boycott (1996) demonstrated the existence of two distinct amphibian faunas in Swaziland. The "afromontane" fauna corresponds with aquatic ecosystems in high-lying montane grasslands, while the "East African lowland" fauna corresponds with aquatic ecosystems in low-lying savannas. Similarly, there appear to be two broad mammalian faunas (Monadjem, 1998b); one corresponds with montane grasslands, while the

other with low-lying savannas. Though not quantified, a similar pattern seems to be evident in the avifauna (A. Monadjem & V. Parker, personal observations). It is interesting to note that the greatest number of endemic and near-endemic vertebrates occur in the montane grassland ecosystem (Table 2). Interestingly, trees show a different pattern to that of vertebrates, with forests having the highest diversity (this is discussed further, below).

Table 2: Species diversity by ecosystem

Taxon	Grassland	Savanna	Forest	Aquatic	Total
Fish	0	0	0	51 (100%)	51
Amphibians	9 (21%)	10 (24%)	1 (2%)	37 (88%)	42
Reptiles	51 (46%)	76 (69%)	12 (11%)	7 (6%)	110
Birds	138 (28%)	290 (58%)	91 (18%)	97 (19%)	500
Mammals	49 (39%)	95 (75%)	13 (10%)	1(1%)	127
Total	247 (30%)	471 (57%)	117 (14%)	192 (23%)	821

Values in brackets represent the percentage of the total indigenous fauna (from Monadjem et al. 2003a)

1.2.2.2 VEGETATION TYPES

The vegetation of Swaziland was originally described by I'Ons (1967) and Acocks (1988). Based on this material, Sweet and Khumalo (1994) provide a detailed description of the vegetation in Swaziland, which they then classified into 22 units within the six physiographic zones mentioned above. A new vegetation map has recently been produced and published in the Swaziland Tree Atlas (Dobson & Lotter 2004; Loffler & Loffler 2005).

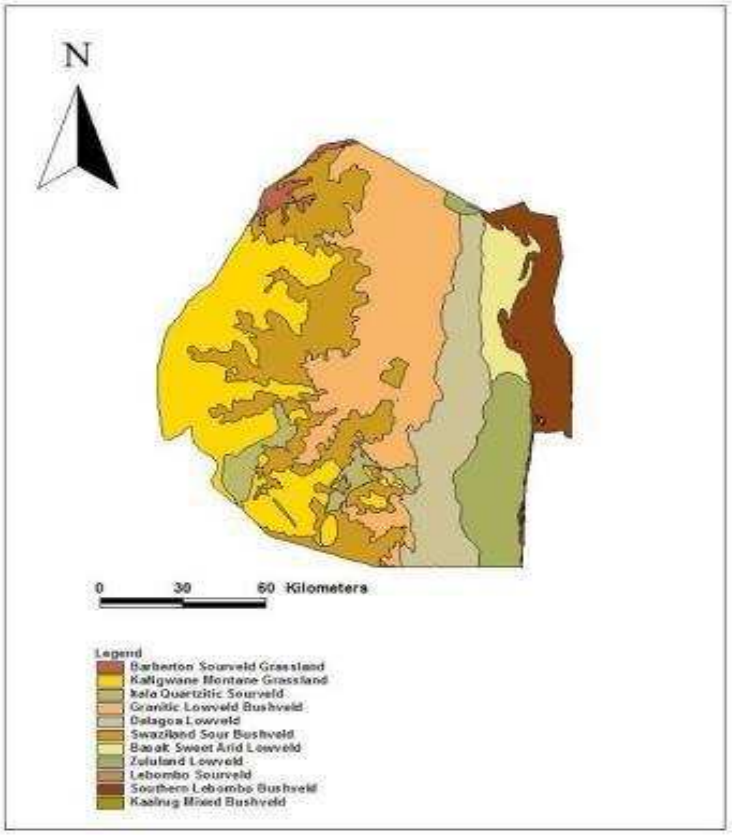


Figure 2: Map of the recently produced vegetation types of Swaziland

(from Dobson & Lotter 2004)

These vegetation units are based on climatic, topographic, and soil characteristics as well as plant species composition. The vegetation classification of Sweet & Khumalo (1994) is similar to the vegetation types described by Goudie & Price Williams (1983), but is more detailed than the latter. In contrast, the vegetation map of Dobson & Lotter (2004) is based on the categories developed for South Africa, and hence demonstrates a regional perspective lacking in earlier maps.

1.2.2.3 FAUNA & FLORA

By comparison with the southern African region, the plants and animals of Swaziland have been relatively well surveyed. This is particularly true for trees, birds and frogs. However, very limited information is available for certain groups such as the majority of invertebrates. In a comparison of species richness of plants and vertebrates, the former account for more than three-quarters of the species, followed by birds (Figure 3).

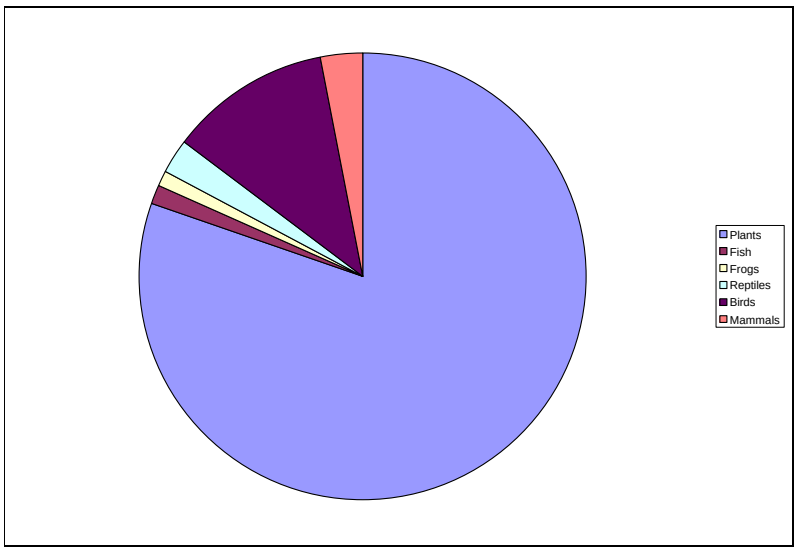


Figure 3: Graph showing proportional contribution of plant and vertebrate animal species in Swaziland

1.2.3 ENDEMISM

Despite the small size of the country, Swaziland has an impressive list of endemic species. A total of 20 endemic plants are listed for Swaziland (Dlamini & Dlamini 2002) or suspected to be endemic (Dobson, in litt.). The highest species richness of endemic plants (accounting for 60% of endemic species) lies within montane grasslands around Mbabane and Malolotja Nature Reserve in the north-western part of the country (Figure 5). The northern parts of the Lubombos support a smaller proportion of endemics, with a small number of species scattered around the country (Monadjem et al. 2003b).

The sole endemic vertebrate is a lizard; the Swazi thick-tailed rock gecko (*Afroedura major*) (Figure 6) which occurs in rocky outcrops on the ecotone between the montane grassland and savanna ecosystems (Table 3).

No other vertebrates are endemic to Swaziland. However, a number of species are near-endemics, occurring in neighbouring South Africa and Swaziland only. A total of 52 such bird species have been documented from Swaziland, with half of them restricted to montane grasslands (Table 3).

Montane grasslands, therefore, play an important role by providing habitat for many of Swaziland's endemic and near-endemic plants and animals.

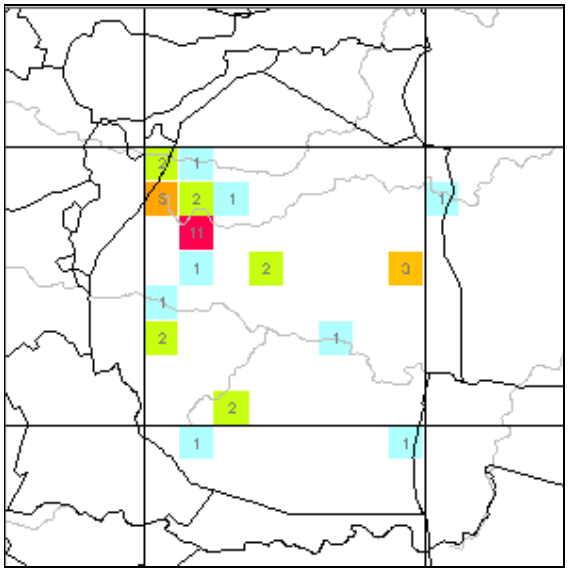


Figure 4: Distribution of endemic plant species richness in Swaziland

(from Monadjem et al. 2003b)

Table 3: Distribution of endemic and near-endemic vertebrates in ecosystems of Swaziland

Taxon	Grassland	Savanna	Forest	Aquatic	Total
Endemic (vertebrates)	1 (100%)	0	0	0	1
Near endemics (birds)	26 (50%)	13 (25%)	12 (23%)	1 (2%)	52

(from Clancey 1986; Monadjem et al. 2003a)

1.2.4 NATIONAL STATUS

The global targets of restoring and maintaining populations of declining species, and improving the status of threatened species (Goal 2) have not been met. As can be seen from the results presented above, populations of many species are still in decline, and several species have gone extinct in the past few decades. The NBSAP calls for the protection of threatened and endemic species. A first step in this process is the identification of threatened species. To this end, Red Data Lists have been prepared for two groups of organisms: vertebrates and higher plants.

Article 7 of the CBD calls for the identification and monitoring of various components of biodiversity. Although a significant amount of work has been conducted on various taxa and at the ecosystem level, this work has not been coordinated or managed. Rather, it has been carried out by independent researchers, working on personal agendas (albeit for the good of the nation). At present, an umbrella institution that would set national targets for biodiversity research, access funding and review findings at regular intervals does not exist.

1.3 THE STATUS OF SWAZILAND'S BIODIVERSITY

1.3.1 STATUS OF TERRESTRIAL BIODIVERSITY

1.3.1.1 FLORA

The gymnosperms and angiosperms were initially surveyed by Compton (1966, 1976) who recorded 2 118 species as occurring in Swaziland. Although an impressive contribution, many species were overlooked by Compton. Kemp (1983) revised the flora of Swaziland and produced an updated flora checklist listing 2 715

species which included Pteridophytes. Since this publication, various collectors have contributed a large number of new species, bringing it up to 3 441 species (Braun et al. 2004).

Atlases have been produced for the Pteridophytes and trees of Swaziland (Roux 2003; Loffler & Loffler 2005). The latter work is impressive in its coverage, possibly providing the most detailed atlas of its kind for any group of plant or animal in Africa. A total of 633 tree species were recorded during the project, with 35 exotic and 598 indigenous species, representing just over 17% of Swaziland's indigenous flora. Spatial diversity of tree species varies considerably within the country, with certain forests supporting the highest diversity (Figure 3).

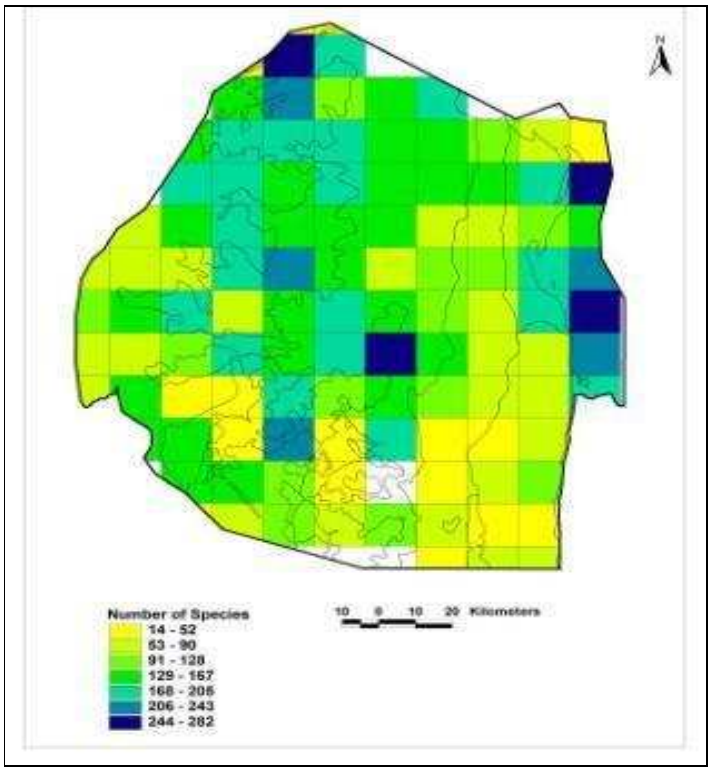


Figure 5: Map showing distribution of tree species richness

Dark blue squares indicate highest richness (from Loffler & Loffler 2005)

1.3.1.2 VERTEBRATES

Vertebrates have been relatively well documented in Swaziland. Included in this group are the fishes, amphibians, reptiles, birds and mammals. In total, 821 species of vertebrates have been recorded from Swaziland (Table 3).

The fishes and amphibians of Swaziland will be dealt under the section 1.3.2. (Freshwater Biodiversity Status). A reptile atlas of South Africa (including Swaziland) is currently being prepared for publication and should be printed before the end of 2010.

The birds of Swaziland were practically unknown prior to the intensive 7-year survey by Parker (1992, 1994). This survey is regarded as one of the most thorough vertebrate surveys of the southern African region, and has contributed immensely to the knowledge of the distribution and abundance of birds in Swaziland. Recently, information on the distribution of certain raptor nest sites has been published (Monadjem 2005; Monadjem & Garcelon 2005; Monadjem & Rasmussen 2008; Bamford et al. 2009; Monadjem & Bamford 2009).

Up to 1996, no published information existed on Swaziland's mammals. An intensive 5-year survey has resulted in the publication of a checklist (Monadjem 1997a) and a book on the mammals of Swaziland (Monadjem 1998a). More recently, work on a bat atlas for the country and for southern Africa has been ongoing since 2004 and is now in the process of being published as a book (Monadjem et al. In press).

1.3.1.3 INVERTEBRATES

Swaziland's non-arthropod invertebrates remain poorly known and require urgent attention in the form of country-wide surveys.

The arthropods are by far the largest phylum (in terms of number of species as well as number of individuals) of animal or plant on the Planet. The number of species of insects (which is the largest class in this phylum) in southern Africa is estimated to lie somewhere between 43 000 and 80 000 or more (Scholtz & Chown 1995), compared to approximately 2 000 vertebrates. Due to this incredible diversity, the taxonomy of arthropods is still far from being fully understood and new species are discovered almost daily.

In Swaziland, very little attention has been paid to arthropod diversity. Most of the survey work has concentrated on economically-important groups such as pests (e.g. certain groups of insects) and vectors of disease (e.g. ticks). However, amateur collectors have greatly contributed to our knowledge of some groups e.g. moths and butterflies (Duke et al. 1999).

That arthropods are the most diverse group of organisms in Swaziland, is not in doubt. For example, the Lepidoptera (butterfly and moths) account for 1 654 species in the country, and they represent just a fraction of total arthropod diversity. There may well be in excess of 20 000 species of arthropods in Swaziland, but far more survey work is required before a meaningful estimate can be made.

1.3.2 FRESHWATER BIODIVERSITY STATUS

The fishes of Swaziland were originally surveyed by Clay (1976) and Hyslop (1994), and most recently by Bills et al. (2004). The amphibians of Swaziland were first surveyed by Poynton (1964) and more thoroughly by Boycott (1992a, b, c) and Boycott & Culverwell (1992). The latest distributions for Swazi frogs have been published in the recent South African frog atlas (Minter et al. 2004).

The status of aquatic macro-invertebrates (such as molluscs, aquatic insects and crustaceans) in Swaziland remains very poorly known and no recent published studies have been undertaken.

1.4 THREATS TO BIODIVERSITY

Red Data Books exist for Swaziland's vertebrates and higher plants, which perform a very important function in that they not only list threatened species within a particular group, but they also discuss the threats facing those species and the group in general.

1.4.1 GLOBAL THREATS

McNeely et al. (1990) have listed and discussed in detail the global threats to biodiversity. Included in this category are factors such as the rapidly increasing human population whose needs will soon outstrip the biological resources of this Planet; global warming and climate change; the threat of nuclear war and nuclear disasters (such as the one at Chernobyl); and international trade in endangered species and species products.

1.4.2 REGIONAL THREATS

Regional threats to the biodiversity of Swaziland include factors such as atmospheric and water pollution; reduction of flow in rivers which have their sources in South Africa; cross-border smuggling of indigenous species and species products; and the washing downstream of alien invasive plant species (such as *Chromolaena, Lantana, Sesbania* and *Melia*) from South Africa.

1.4.3 LOCAL THREATS

It is difficult to catalogue the threats to Swaziland's biodiversity, since almost every human activity, from collecting firewood to building houses and from keeping cattle to irrigation farming, impinges, in one way or another, on biodiversity. The different activities, however, do not all have the same impact.

Presented below is a framework of threats to Swaziland's biodiversity. Factors are either proximate in that they are directly responsible for biodiversity erosion (e.g. illegal hunting) or are ultimate causes of the problem (e.g. poverty) which are usually political or economical in nature. The loss of biodiversity will not be stemmed until

the root causes are addressed. The threats facing Swaziland's fauna can be grouped into the broad categories discussed in 1.4.5.

1.4.4 THREATENED SPECIES

Many species in Swaziland have declining populations, some of which have already gone extinct such as the African wild dog (*Lycaon pictus*). A necessary first step to conservation is an assessment of species status to identify and, where possible, quantify rates of decline. Swaziland has produced two recent red data lists; one for plants (Dlamini & Dlamini 2002) and one for vertebrates (Monadjem et al. 2003a). The former list has been updated for trees (Loffler & Loffler 2005).

A total of 132 species of vertebrates are listed in this book, consisting of 11 species of fish, 4 species of amphibians, 14 species of reptiles, 55 species of birds and 48 species of mammals (Table 4). These threatened species represent between 9-20% of the total numbers of fishes, amphibians, reptiles and birds occurring in Swaziland, but a significant 38% of the mammalian fauna. When only the high risk categories are considered (i.e. regionally extinct, critically endangered, endangered and vulnerable), the threatened birds and mammals represent between 7-9% of their total species richness, while the fishes, amphibians and reptiles represent between 2-4% of their diversities. Therefore, in both absolute and relative terms, birds and mammals are disproportionately threatened in Swaziland.

Table 4: Summary of the number of vertebrates in each threat category

	Number of species				
Threat category	**Fishes**	**Amphibians**	**Reptiles**	**Birds**	**Mammals**
Regionally Extinct	0	1 (2%)	0	7 (1%)	3 (1%)
Critically endangered	3	0	0	1	0
Endangered	1	0	0	12	3
Vulnerable	2	0	2	14	6
Sub-total (threatened)	6 (10%)	0	2 (2%)	27 (5%)	9 (7%)
Sub-total (others)	5	3	12	21	36
Total	**11 (18%)**	**4 (9%)**	**14 (13%)**	**55 (11%)**	**48 (37%)**

Values in brackets represent the percentage of the total indigenous fauna occurring in Swaziland

Of the 34 high risk species of birds, 13 (38%) species are birds of prey and a further 9 (26%) species are water birds (or birds associated with wetlands). These two groups of birds, therefore, account for almost two-thirds of threatened birds (Monadjem & Rasmussen 2008), even though they only represent less than one-third of the species diversity. Of the 12 high risk species of mammals, 9 (75%) are either ungulates or large carnivores (> 10 kg). These four groups (birds of prey, water birds, ungulates and large carnivores) account for 61% of all high risk vertebrates.

A total of 305 species of plants have been included in the red data list for the country, representing 9% of the total plant species richness. However, 62 species (2%) are threatened (Critically Endangered, Endangered or Vulnerable), while 155 species are data deficient.

1.4.5 CAUSES OF BIODIVERSITY LOSS

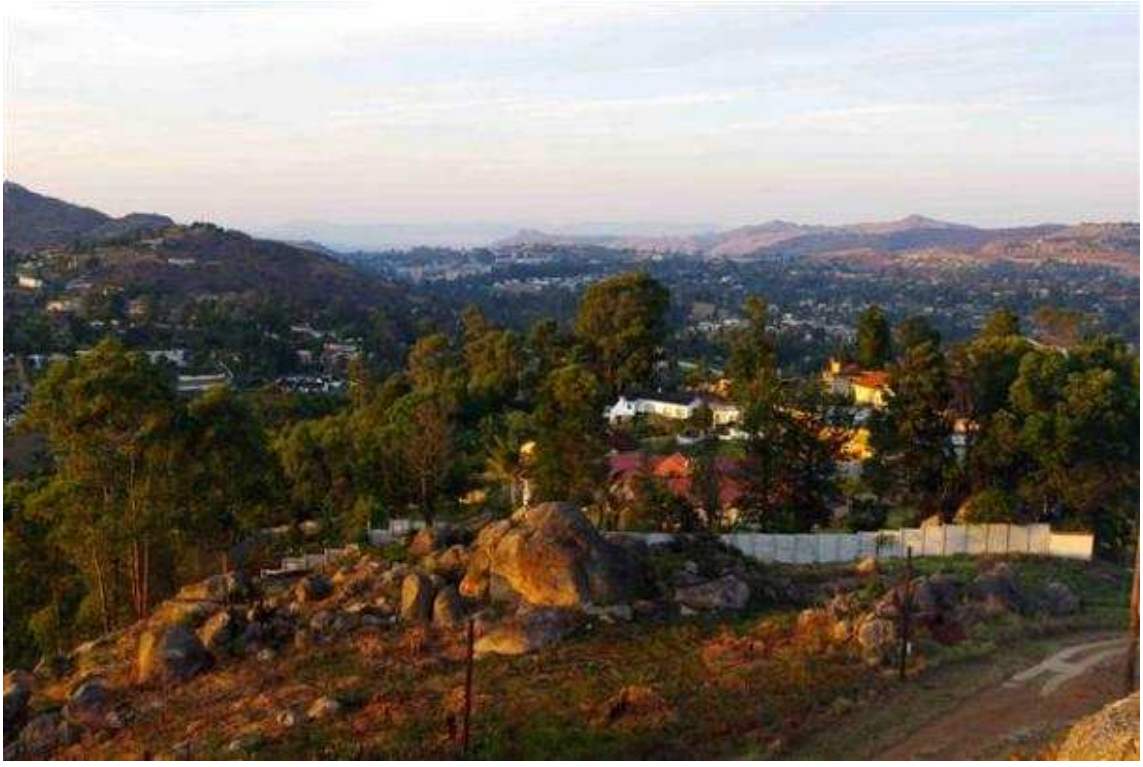
1.4.5.1 HABITAT DESTRUCTION

Habitat destruction is probably the most important factor leading to the decline and, ultimately, the extinction of animal and plant populations the world over. Habitat destruction has best been publicised by the clear-cutting of tropical forests. However, habitat destruction can be, and usually is, much more subtle. Any alteration to the natural "abode" of a species that negatively affects populations of that species is referred to as habitat destruction.

Habitat destruction may take on any of the following forms.

(i) Urbanisation: Swaziland's towns and cities are expanding at rapid rates. With this expansion, comes extreme habitat transformation (from natural vegetation to "concrete jungle"). At present, at least one species of bird, the Blue Swallow *Hirundo atrocaerulea*, is threatened by such uncontrolled expansion of the city of Mbabane.

Figure 6: Urban development encroaching previously undisturbed areas in Mbabane



(ii) Agricultural development: Agricultural development has transformed a very large area of Swaziland. In the Highveld much of the natural grassland and forest have been replaced by timber plantations. Sugar cane, cotton, citrus and maize have replaced natural savanna in the Lowveld and Middleveld. Finally, subsistence farming has replaced natural vegetation in all four regions. Most indigenous species are unable to survive in exotic plantations or crop mono-cultures. Linked with land transformation is the transformation of aquatic habitats, such as rivers, as a result of chemical pollution (pesticide and fertilizer residues) and increases in the silt load (due to soil erosion). This can have a severe impact on fish populations and macro-invertebrates. Much of the farming done in the Lowveld requires irrigation which, in turn, affects the flow of the rivers and hence alters their suitability for aquatic organisms. Pesticide pollution may poison soil micro-flora and reduce their numbers which in turn may cause larger plants to lose their vigour and eventually disappear.

Figure 7: Bush clearing for agriculture or firewood

Photos courtesy of Linda Loffler

(iii) Industrial development: Industrial development at Matsapha, if unrestrained, could have an enormous impact on Swaziland's environment and biodiversity. Numerous projects have shown that the Usushwana River at Matsapha is being seriously contaminated with industrial waste which is causing the decline in populations of aquatic organisms, and altering the species composition of macro-invertebrates, fish and aquatic plants. Air pollution is also a concern. The effects of acid rain on plants can be highly detrimental.

(iv) Construction: Insensitive construction (e.g. roads) is potentially very damaging, often leading to destruction of natural veld and soil erosion.

Figure 8: New road construction leading to erosion

Photo courtesy of Linda Loffler

(v) Wood-cutting: Certain species of trees are felled for building homes and fences, household implements and furniture and for firewood. The rate of deforestation has yet to be measured, but appears to be quite high judging by the amount of firewood on sale on the sides of the Nation's main roads (especially in the Middleveld and Lowveld). This not only affects the tree species that are being cut, but also the animals for which these trees form their natural habitat. Large expanses of Swazi Nation Land have been cleared of trees, which has drastically reduced the bird and mammal species composition of these areas. Swaziland's indigenous trees are also cut for the manufacturing of tourist artefacts. Populations of some species of trees (such as *Pterocarpus angolensis*, kiaat or umvangati) are rapidly being depleted, which could result in local extinctions.

Figure 9: Indigenous tree harvesting

Androstachys harvesting

Maguga PWA kiaat harvesting

Photos courtesy of Linda Loffler

(vi)Livestock: The density of live-stock, especially cattle, on Swazi Nation Land in many communities is far higher than the carrying capacity of the land. As a result, severe overgrazing has occurred in these areas. This has lead to a reduction in the species diversity of small mammals, birds and probably certain insect groups such as grasshoppers. The effect of overgrazing on the indigenous flora has not been quantified but appears to be highly detrimental.

(vii) Indiscriminate use of fire: Fire is an integral and essential part of both grassland and savanna ecosystems (which together cover over 99% of Swaziland). However, the indiscriminate use of fire (such as annual winter burning on the Highveld) can and does alter the habitat which often results in a decrease in biodiversity.

Figure 10: Fire used to obtain honey

Photo courtesy of Linda Loffler

1.4.5.2 OVER-EXPLOITATION

Illegal and uncontrolled hunting has resulted in the extermination of most of Swaziland's large mammals, especially on Swazi Nation Land. By the late 1950s, numerous species of mammals had been hunted to extinction, although most of these species have now been reintroduced to nature and game reserves. However, at least one species of mammal (wild dog *Lycaon pictus*) and one species of bird (Kori Bustard *Ardeotis kori*), which were hunted to extinction, have not been reintroduced to the Kingdom.

Many species of fauna and flora are used in traditional medicine and are thus heavily exploited by local tinyanga (traditional healers). The effects of this exploitation have yet to be quantified. But many tinyanga are now complaining about the difficulty of finding certain species which were common not so long ago indicating a decline in the population of these species.

Many species of vertebrates are killed for food and/or superstition. For example, most snakes detected by Swazis are killed on the spot, despite the fact that only a very small proportion of the Kingdom's species are venomous (and despite the fact that snakes play many important ecological roles e.g. control of pest populations).

1.4.5.3 IMPACT OF EXOTIC SPECIES

Introduced (exotic) species often survive and increase rapidly in new environments due to the fact that their natural predators are missing. These introduced species can have a significant impact on the ecosystems into which they have been introduced. For example, the exotic fish rainbow trout *Onychorhynchus mykiss* and large mouth bass *Micropterus salmoides* can have devastating effects on local fish populations in southern Africa. Both these species occur in Swaziland, where their impacts have yet to be studied.

The introduction of alien plants can have considerable impact on the natural vegetation (such as *Chromolaena odorata*, *Sesbania* spp., *Psidium guava*, and *Lantana* spp.), which in turn can affect animal populations such as butterflies.

Figure 11: Exotic plants always pose a threat to the natural environment

Photo courtesy of Linda Loffler

1.4.5.4 WEAK LAW ENFORCEMENT

Within the reserve network, laws pertaining to conservation of biodiversity are enforced. However, outside of these protected areas, the laws are often ignored or only marginally enforced. For example, the killing of any species of bird (with the exception of the helmeted guineafowl or *imphangele*) constitutes a crime, but the numerous people that hunt birds outside of protected areas are rarely prosecuted.

1.4.5.5 IGNORANCE

Many of the actions referred to above (habitat destruction, over-harvesting, etc) are as a direct result of ignorance of the value of biodiversity. There is also a lack of understanding (both on the part of the lay-person as well as the technical "expert") of ecosystem functioning, especially in the tropics and subtropics. As a result, developments which appear benign are often very destructive. There is therefore, an urgent need both to educate the general public about biodiversity issues and to conduct further research.

1.4.5.6 POPULATION GROWTH

The Swazi population is growing at over 3% per annum (one of the highest growth rates in Africa). With the economic growth rate at only 2.7% per annum, the population is growing faster than the formal economy. This has resulted in an increasing number of people turning to the exploitation of natural resources. Proper family planning is an essential component of sustainable environmental management.

1.4.5.7 LACK OF EQUITY IN OWNERSHIP AND MANAGEMENT OF PROTECTED AREAS

In Swaziland (as is the case in many other countries in Africa), neighbouring communities have traditionally been excluded from the management (and exploitation) of protected areas. As a result, many communities feel that these protected areas are of little value to them (Hackel, 1990). For these protected areas to demonstrate their value, neighbouring communities need to be integrated into their management and planning. This is beginning to happen in Swaziland, but the whole process needs to be accelerated and taken further.

A related threat is the removal of responsibilities of biodiversity management from government, and the often unclear lines of responsibility for wildlife management in the country.

Local initiatives such as the Shewula community conservation area and community tourism enterprises at Ngwempisi and Mahamba are extending local ownership and management of biological resources. There will be significant conservation benefits from these initiatives.

1.4.6 THREATS TO TERRESTRIAL BIODIVERSITY

The threats to biodiversity in Swaziland and the threatened species themselves have been summarised above (section 1.4.4 and 1.4.5). Many of the threats operate across terrestrial and freshwater ecosystems (such as contaminants in aquatic systems that may accumulate in higher trophic levels such as fish, and ultimately be removed from the aquatic system by terrestrial predators such as eagles and otters). Hence we have chosen to discuss the threats to terrestrial and freshwater ecosystems together (see sections 1.4.4 and 1.4.5 above).

1.4.7 THREATS TO FRESHWATER BIODIVERSITY

The threats to biodiversity in Swaziland and the threatened species themselves have been summarised above (section 1.4.4 and 1.4.5). Many of the threats operate across terrestrial and freshwater ecosystems (such as contaminants in aquatic systems that may accumulate in higher trophic levels such as fish, and ultimately be removed from the aquatic system by terrestrial predators such as eagles and otters). Hence we have chosen to discuss the threats to terrestrial and freshwater ecosystems together (see sections 1.4.4 and 1.4.5 above).

1.5 IMPLICATIONS OF BIODIVERSITY LOSS

The implications of biodiversity loss are particularly severe in a country like Swaziland where tradition and culture have been preserved and continue to play an important role in the lives of most Swazis. Rich Swazi tradition relies heavily on an equally rich biodiversity base. From the harvesting of foods and medicinal plants, to the collection of firewood (still the main source of energy for the average rural Swazi family) and building material, and traditional attire (mostly from wild ungulate and carnivore skins), the very essence of being Swazi depends on the natural resources once plentiful in the Kingdom.

Beyond the obvious and dramatic impact of biodiversity loss on Swazi culture, the following impacts should also be noted: degradation of ecosystems and hence a loss of ecosystem services; loss of tourism potential; loss of revenue from the pharmaceutical industry; accelerated global warming linked with deforestation; pollution of rivers leading to illness and disease among rural Swazis, many of whom do not have access to alternative sources of water.

2 NATIONAL BIODIVERSITY STRATEGIES AND PLANS

2.1 POLICY AND LEGISLATIVE CONTEXT

A large amount of fragmented legislation pertaining to biodiversity exists in the country, most of which is housed in the Ministry of Tourism and Environmental Affairs and Ministry of Agriculture. Much of this legislation is outdated and many gaps and overlaps were identified. Major gaps in the legislation include the lack of support for sustainable utilization of biological resources on Swazi Nation Land, and the lack of an umbrella Act that integrates the fragmented legislation. Other gaps include insufficient protection of threatened species and aquatic systems, and inadequate support for *ex situ* conservation and control of alien invasive organisms. The major overlap in legislation pertains to the proclamation of sanctuaries/reserves.

To address the problems associated with the country's legislation, an all-encompassing Biodiversity Management Policy and Act is being developed. This would have the effect of integrating existing relevant legislation into one and clearly define the roles of various key institutions. Furthermore, the Act would have the authority to develop new and relevant legislation.

The Flora Protection Act, gazetted in 2000, sought to protect indigenous flora and to provide for matters incidental thereto. The Act replaced the 1952 Act. What is significantly different about the 2000 Act as compared to the 1952 Act is the requirement that an Environmental Impact Assessment (EIA) be carried out in respect of any activity that would impact on indigenous flora.

To broaden investigation of matters that may impact upon biodiversity, the Environmental Management Act, gazetted in 2002, sought to strengthen the country's environmental governance capacity and to provide and promote the enhancement, protection and conservation of the environment and the sustainable management of natural resources. It also turned the SEA into a body corporate and established the Swaziland Environment Fund. Closely related is the Environmental Audit, Assessment and Review Regulations of 2000 that requires a systematic examination of the environmental impact of the proposed project to determine whether or not the

activity will have any adverse impacts on the environment and prepare a mitigation plan to manage the resulting impacts.

Some positive achievements have been made with regards to updating legislation with the preparation of the Biodiversity Conservation and Management Policy and Bill in 2008, the Biosafety Bill in 2008 and the Access and Benefit Sharing Bill in 2008.

The Biodiversity Conservation and Management Bill seeks to resolve the fragmented nature of biodiversity related legislation at national level by consolidating different laws and giving effect to the principle of cooperative governance, while dealing with the commitments under the CBD.

In line with the objectives of the CBD, the Biodiversity Bill provides for:

- the management and conservation of biological diversity and its components within Swaziland;
- the use of indigenous biological resources in sustainable manner;
- and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources; and
- the protection and conservation of natural resources in the country;
- giving effect to the CBD and other related ratified international multilateral environmental agreements relating to biodiversity which are binding on Swaziland;
- co-operative governance in biodiversity management and conservation; and
- regulation in the international trade in biological resources.

The Biodiversity Management Policy was prepared in 2008 to inform the Bill. The long-term goal of the Biodiversity Conservation and Management Policy is to ensure that: "The biodiversity of Swaziland is adequately conserved and protected, sustainably used and managed and equally benefiting all people in Swaziland".

The policy aims to address the threats and opportunities relating to biodiversity conservation and utilisation in Swaziland. The policy introduces the status and framework of biodiversity in line with the internationally accepted concept and approach of biodiversity conservation following definitions and regulations set by the Convention on Biological Diversity signed and ratified by Swaziland. The policy is set around the four key pillars for biodiversity:

Pillar 1: To conserve the biodiversity of Swaziland. This will cover the biological diversity of landscapes, ecosystems, habitats, communities, populations, species and genes that exist in Swaziland.

Pillar 2: To encourage the sustainable use of biodiversity in Swaziland. The principle is to use the biological resources in a sustainable manner through integrating biological diversity conservation and natural resource management whilst minimizing adverse impacts on biological diversity.

Pillar 3: To ensure access and equitable sharing of benefits in Swaziland. This will imply that benefits derived from the use and development of Swaziland's genetic resources will also serve national interests.

Pillar 4: To expand the capacity to manage biodiversity in Swaziland. Important factors in this process are (1) developing human, institutional and systemic capacity, (2) enhancing the knowledge of biodiversity and (3) promoting international cooperation and exchange.

The policy provides an overview of the current issues in relation to the conservation of biodiversity, defines policy objectives and suggests key strategies to be developed and implemented that will address issues of biodiversity conservation and utilisation. The Swaziland Biodiversity Conservation and Management Policy acknowledges the importance of the key objectives of the UNCBD and provides the framework for the further strategy and programme development.

Currently, there is no policy to regulate access and benefit sharing as well as bio-prospecting in Swaziland. Institutional mechanisms to govern bio-prospecting and related issues have also not been set up. Also, the main conclusions from the draft policy on biotechnology and biosafety need to be correlated with a general biodiversity framework policy. There is thus need for a policy that will directly address and cover such issues.

A Biosafety Bill was prepared in 2008 and seeks to:

- ensure an adequate level of protection in the field of the safe transfer, handling and use of genetically modified organisms (GMOs) resulting from modern biotechnology that may have an adverse effect on

the conservation and sustainable use of biological diversity, taking also into account risks to human health;
- provide a transparent and predictable process for review and decision-making on such GMOs and related activities; and
- implement the Cartagena Protocol on Biosafety to the Convention on Biological Diversity.

2.2 SWAZILAND'S NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

In 1997, the Government of Swaziland (GoS) published the Swaziland Environment Action Plan (SEAP) and initiated the National Biodiversity Strategy and Action Plan (NBSAP). A first final draft was prepared and submitted in April 1999 which was reviewed by, *inter alia*, an international consultant. The NBSAP was revised accordingly and a final draft was submitted to the Swaziland Environment Authority (SEA) in April 2001. This version was approved by the SEA Board. . It is worth noting, however, that the NBSAP is recognised as a policy document by the Public Policy Coordination Unit (PPCU) in the Prime Minister's Office and has been used as a working document by GoS relating to biodiversity issues in Swaziland.

There are now plans to revise NBSAP in the financial year April 2010 – March 2011. The funds required to carry out this revision have been budgeted for by the SEA, and the consultancy is expected to be advertised in early 2010.

2.3 TARGETS AND INDICATORS

Although this was initiated by the Convention on Biological Diversity, the NBSAP is an integral part of the Swaziland Environment Action Plan (SEAP). It recognises that the biodiversity in Swaziland is unusual for a country so small; six physiographic zones are normally spread over a much wider area. As well as these physiographic zones, it refers to another method of classification - into biomes, which represent large, natural and reasonably homogenous areas of the Earth's biotic and abiotic surface.

The result of the plan is the establishment of six goals, and recommendations towards their achievement. The goals are to:

1. Establish an effective, sustainable institutional framework for co-ordinating and facilitating the management of biodiversity in Swaziland and for the implementation of relevant policies, strategies and laws.
2. Provide easily accessible and up-to-date biodiversity information.
3. Identify components of biodiversity with national, regional and/or international significance and conserve these components within an achievable, prioritised framework of interventions.
4. Identify and promote ways and means for the sustainable use of biodiversity.
5. Promote the conservation of biodiversity through sustainable development of nature-based tourism in the country.
6. Foster a greater public understanding of biodiversity.

2.4 PROGRESS ON IMPLEMENTATION OF NBSAP

The NBSAP is widely used within the sector and has played an important role in directing and prioritising certain activities and it does provide direction for stakeholders as to where resources and efforts need to be prioritised and in this manner goes some way to focussing efforts in a common direction to achieve its goals.

2.4.1 CHALLENGES

The revision or updating of the NBSAP remains a critical milestone in meetings the country's long-term objectives for biodiversity management. Indications are from government that resources have been found to revise the NBSAP in 2010.

2.5 PROGRESS IN RESPECT OF COP 8 MATTERS

Parties were requested in several decisions taken at COP 8 to submit information through their national reports in relation to certain specific matters. In compliance with these decisions, relevant information on these matters is provided below.

2.5.1 INDIGENOUS AND LOCAL COMMUNITIES

Paragraph 2 of COP 8 Decision VIII/5 invites parties, through their national reports, to report on progress in achieving national participation of indigenous and local communities and associated capacity building. This request is related to Article 8(j) of the Convention that requires parties to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional life styles relevant for the conservation and sustainable use of biodiversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovation and practices and to encourage equitable sharing of the benefits arising from their utilisation.

Swaziland has made good progress in putting the legal frameworks and regulations in place for access and benefit sharing (ABS). The Access and Benefit Sharing Bill (2008) calls for the regulation of bioprospecting involving biological resources and the export of indigenous biological resources from Swaziland for the purposes of bio-prospecting and other types of research.

The Access and Benefit Sharing Bill also provides for the fair and equitable sharing of benefits arising from bio-prospecting involving biological resources through the drafting of benefit-sharing and material transfer agreements.

2.5.2 PROTECTED AREAS

Paragraph 4 of COP 8 Decision VIII/24 urges other governments and multilateral funding bodies to provide the necessary financial support to developing countries, including the least developed and small island developing states, as well as countries in transition, to enable them to build capacity and implement the programme of work and undertake reporting required, to enable the review of implementation of the programme of work on protected areas.

Swaziland is regarded as a developing country and has not provided support to other developing countries under the above decision. Swaziland's progress for its protected areas has been limited with no new protected areas gazetted since the Third National report was submitted. The Swaziland National Trust commission, within whom the power to declare and manage protected areas falls, has made some recent progress in applying for two new areas to be gazetted as national reserves. The two areas are now under active consideration.

Swaziland has an established network of seven terrestrial protected areas covering 3.7% of country. The current protected area network falls short of protecting a representative sample of ecosystems. This will gradually be addressed through a more active and streamlined process of gazetting new areas in consultation with the land owners and communities affected.

In Swaziland there are three types of conservation area:

- areas gazetted as National Parks or Nature Reserves under the Swaziland National Trust Commission (SNTC) Act of 1972 amended in 1973
- areas gazetted as Game Reserves or Sanctuaries under the Game Act of 1953 amended in 1991 and 1993
- non-gazetted areas.

National Parks and Nature Reserves have equal protection status and are afforded maximum level of protection to the ecosystem as a whole, with restrictions on access and on any activities that affect the natural ecosystem (from removing rocks to poaching).

Game Reserves or Sanctuaries have equal protection status and afford a maximum level of protection to animals and birds within the area, placing firm restrictions on access and on any activities which directly harm such species.

Non-gazetted areas have no restrictions on activities other than those which apply to any normal area of land under similar ownership.

A 'conservation area' means 'any natural area which is actively managed with biodiversity conservation as a primary objective.' The concept of 'conservation area' is therefore distinct from that of 'protected area' which means 'any area which is proclaimed by law as an area for biodiversity conservation.' In total there are 17 conservation areas in Swaziland, under various ownership and management scenarios, and with varying levels of legal protection and enforcement.

There are a number of other private farms and national areas which contain wildlife and which are in a natural state. Some are even actively managed to conserve wildlife (for example IYSIS and the Big Bend Conservancy employ rangers to curb game poaching on their extensive cattle ranches). Only six areas have been proclaimed, and these cover 86% of the total area under conservation. Three of the six gazetted areas are Nature Reserves proclaimed under the SNTC Act and managed by the SNTC (Mlawula) or where management has been contracted out by the SNTC to a private company (Malolotja and Mantenga).

The other three gazetted areas are managed privately by Big Game Parks, and include:

1. a Wildlife Sanctuary proclaimed under the SNTC Act (Mlilwane)
2. a Game Reserve proclaimed under the SNTC Act (Mkaya)
3. a Royal National Park, proclaimed under the Game Act (Hlane).

The remaining 11 conservation areas (Shewula, Mbuluzi, Simunye, Nisela, Sibhetsumoya, Mhlosinga, Poponyane, Mutimuti, Oberland, Hawane, Shonalanga) are not gazetted and have no legal conservation status.

In line with governments Privatisation Policy, the commercialisation of eco-tourism activities within SNTC parks has been pursued. Joint Venture Partnerships between the SNTC and Private Sector players has seen the co-management of two reserves including the Malolotja Nature Reserve and the Mantenga Cultural Village

Management of protected areas is undertaken by a national conservation agency, the Swaziland National Trust Commission with cooperation and assistance from private sector entities.

In 2002 a survey to identify protection worthy areas was carried out and using a variety of assessment criteria, 44 protection-worthy areas were ranked in terms of priority for conservation (identified in the above map). No new protected areas have been declared since 1994 when the Mantenga Nature Reserve was proclaimed, though new areas are in the pipeline for proclamation: Phophonyane Nature Conservancy (600 ha), Muti Muti Nature Conservancy (6,000 ha) and Mlumati Nature Reserve (400 ha).

The legal instrument used for declaring protected areas is the SNTC Act of 1972. When assessing a site for protection the following objectives are considered:

- To promote and conserve indigenous animal and plant life and to eliminate non-indigenous animal and plant life,
- To collect together and restore a representative selection of the animal and plant life indigenous to the area,
- To protect, preserve and/or restore objects of geological, archaeological, historical, ethnological and scientific interest,
- To promote and protect the natural ecology and environment,
- To provide facilities for scientific study and education,
- To promote public appreciation of the social, economic and moral value of wildlife conservation,
- Without conflicting with the foregoing objects, to provide enjoyment to visitors.

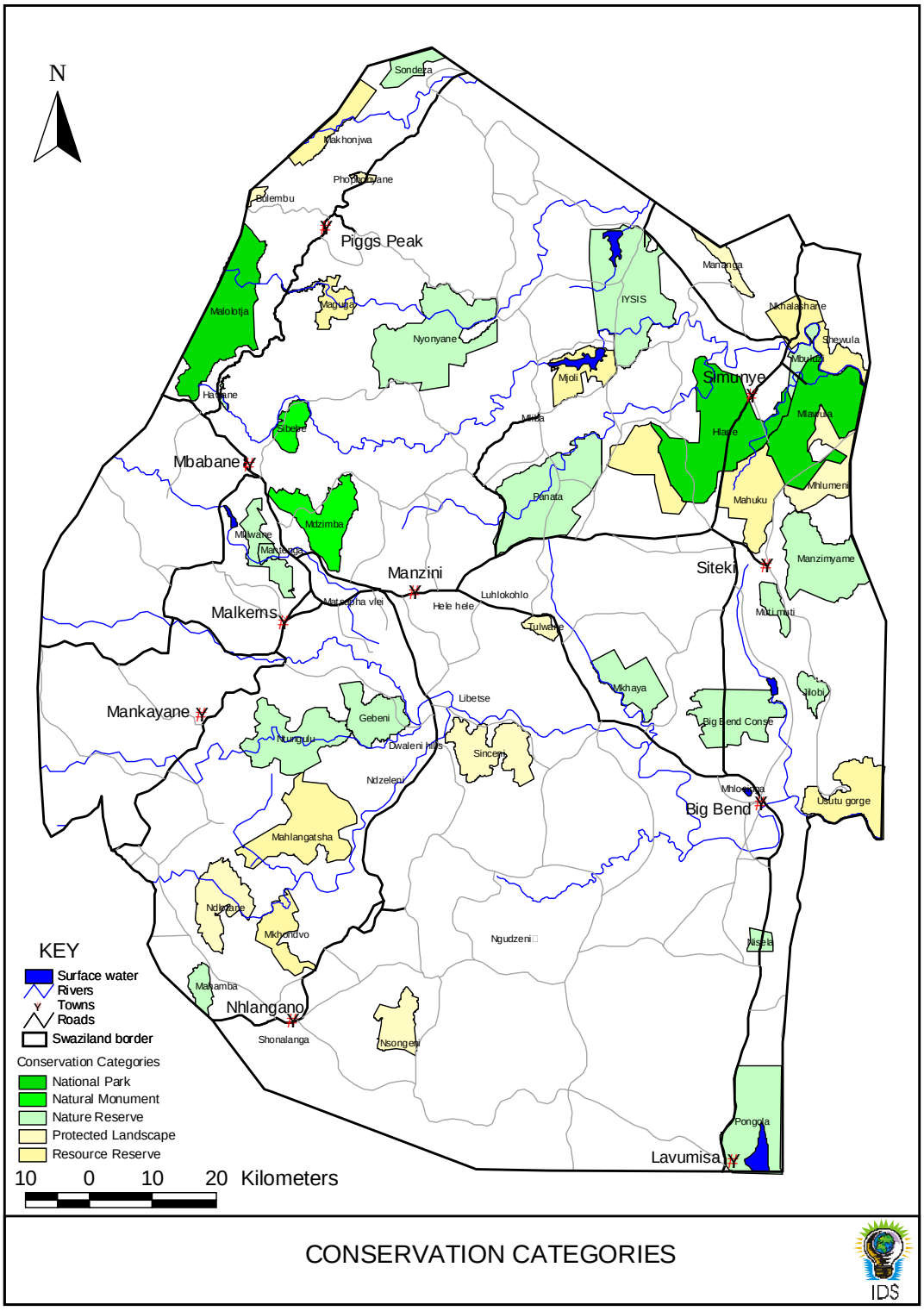
The ecosystem approach has been adopted and efforts are being made through the bioregional programmes to create ecological corridors and link priority biodiversity areas through stewardship programmes (see 3.2.2.1).

The lack of awareness of the importance and role of protected areas in people's daily lives stipulates the need for intensive research and education programmes in the country. Management of any resource requires appropriate research, education and training in order to develop the necessary experience and expertise to make wise decisions. The important role of local communities in protected areas has been recognised and efforts are being made to involve them in management of these parks through co-management agreements and to provide for access and benefit sharing.

Conservation areas in Swaziland employ a total of at least 300 people in various conservation activities including control of access, anti-poaching patrols, monitoring and research, alien-plant control, veld and soil rehabilitation, plant nurseries, environmental education and community outreach. This amounts to about 250 ha per employee, a density which compares very favourably with South Africa's Kruger National Park for example, which has an employment density of approximately 1 800 ha per employee. Moreover, conservation areas in Swaziland are subject to a broad range of beneficial activities (some involving neighbouring communities) that are often contrary to the traditional 'purist' practice of setting aside and policing such areas primarily for the recreation of a select few.

The question of whether current conservation areas are succeeding in conserving biodiversity does not have a simple answer. Certainly in some respects they are. In a comparison of Hlane and Mkaya reserves with neighbouring communal areas, Brown (1999) concluded that the reserves are succeeding in protecting their tree resources from human exploitation, and this is probably true for most conservation areas in Swaziland. Furthermore, Mlawula rangers convicted a number of people for illegal harvesting of ironwood (*Androstachys johnsonii*) during 1998-99 (Roques 1999), which suggests that such resources would be exploited were areas not be protected. However, even though conservation areas may be preventing the exploitation of tree resources, this does not imply that they adequately conserve their woodlands.

Figure 12: Suggested conservation categories on protection worthy areas and existing protected areas



2.5.3 IMPACT ASSESSMENT

Paragraph 5 of COP 8 Decision VIII/28 urges parties to apply voluntary guidelines on biodiversity inclusive environmental impact assessment, as appropriate, in the context of implementing paragraph 1(a) of Article 14 of the CBD and of target 5.1 of the provisional framework of goals and targets towards 2010, and to share their experiences, inter alia, through the clearing house mechanism and national reporting. Paragraph 1 (a) of Article 14 of the CBD requires parties to introduce appropriate procedures requiring environmental impact assessment of proposed projects that are likely to have a significant adverse effects on biodiversity with a view to avoiding or minimising such effects and where appropriate, to allow for public participation in such procedures.

Swaziland formally commenced environmental impact assessments (EIAs) in 1996 when the Environmental Audit, Assessment and Review Regulations under the Swaziland Environment Authority Act, 1992 were promulgated. These regulations were replaced in 2003 by revised EIA regulations under the Environmental Management Act of 2002.

The regulations contain procedures to be followed in the EIA process, including public participation, and also specify "listed" activities which, depending on their nature and associated risk, require either a basic assessment report or a full assessment including scoping and EIA. In the absence of an environmental authorisation, these activities may not be undertaken.

In considering an EIA, the SEA is required to take into account several relevant factors, including the impact on the environment and measures to protect the environment or to prevent, control, abate or mitigate environmental impacts or degradation. The SEA is also required to monitor compliance against the conditions of the authorisation.

Although the CBD announced guidelines of biodiversity inclusive EIAs, Swaziland has not incorporated specific biodiversity impact assessment into its regulations and relies upon the competence of the consultants undertaking the EIA investigations to ensure that biodiversity issues are captured and considered in the formulation of mitigation options. There is, however, a great disparity in the level of detail and scope of assessment of biodiversity in EIAs reviewed by the SEA. A more structured approach, like those in the VOLUNTARY GUIDELINES ON BIODIVERSITY-INCLUSIVE IMPACT ASSESSMENT (UNEP/CBD/COP/8/31).

Despite the submission of many EIA reports, the country still faces challenges with the EIA process, which can be summarised:

- Internal SEA capacity to effectively and efficiently review submitted EIAs is weak
- Varying level of detail and scope in EIAs prepared by different proponents and their consultants
- Building EIA capacity amongst external stakeholders
- Transforming the EIA practitioner industry

Many stakeholders, for different and sometimes conflicting reasons, have expressed disappointment with the EIA process. For many the consultative process is viewed as deficient and for others the project centred approach fails to consider the wider cumulative impacts and issues arising from, for example, residential township developments. A more strategic and holistic approach to EIAs is recommended, with activities categorised in terms of their strategic importance, with a focus on those activities that have potentially significant impacts Lack of political will and commitment to environmental management as well as interference with the EIA process was highlighted, as were concerns regarding the resources and capacity of government to manage the process effectively and efficiently.

While EIAs are intended to serve as a tool that supports sustainable development, they are considered as being for purely administrative compliance and in practice serve to play down potential issues rather than to assess whether such activities should be permitted. Only a handful of EIAs have ever been declined. A major shortcoming identified is that biodiversity considerations are usually inadequately reflected in the EIA process, especially with respect to how the local site-specific issues impact on the broader/regional biodiversity context.

In an effort to transform the EIA practitioner industry, the SEA organised a workshop to facilitate the formation of a national professional association of consultants that would have defined membership qualification and

best practice guidance when conducting EIA investigations and reporting. Although this process started more than a year ago, there has been no movement by the EIA practitioners or the SEA to further this process.

3 MAINSTREAMING BIODIVERSITY

3.1 INTRODUCTION

Mainstreaming biodiversity can be viewed as the incorporation and integration of biodiversity as an important aspect of planning, decision-making, land use and production methods to achieve sustainable development, particularly in those sectors whose core business is not biodiversity conservation. Factors that contribute to successful mainstreaming of biodiversity include good scientific information and understanding; institutional capacity and commitment; strategic cross-sectoral and public-private partnerships; and a willingness by the scientific and biodiversity community to take advantage of opportunities to demonstrate that biodiversity-friendly policies can provide socio-economic opportunities for the poor.

Although it still faces challenges, Swaziland is making steady progress towards mainstreaming biodiversity in both the public and private sectors. This is achieved mainly through the use of EIAs during project formulation and ensures to some degree that the biological resources likely to be affected are assessed and where necessary mitigated for.

The responsibility for managing and conserving biodiversity cuts across national and local government structures as well as government agencies, NGOs, the private sector and communities.

The Ministry of Tourism and Environmental Affairs, which houses the Swaziland Environment Authority (SEA), the Swaziland National Trust Commission (SNTC) and the Forestry Department, is the primary custodian of biodiversity in Swaziland and governs laws pertaining to environmental management, protected areas and plant resources in and outside of protected areas. Both the SNTC and SEA are parastatal organizations funded by government but operating under independent boards appointed by the Minister of Tourism and Environmental Affairs. The King's Office is also a key custodian of biodiversity and governs laws pertaining to game as well as CITES.

The limited institutional understanding of the role and importance of biodiversity affected by sectoral plans and programmes has lead to limited consideration of biodiversity related impacts that could result from the implementation of the sector policy, programme or plan. The SEA attempt to provide guidance and assistance to national structures in the formulation of their development plans but this is ad hoc. The Environmental Management Act does provide for a Strategic Environmental Assessment to be carried out on all such initiative, but to-date no such assessment ahs taken place despite numerous sectoral policies, plans and programmes being developed.

The national policy framework includes the 1999 National Development Strategy (NDS) and the 1997 Swaziland Environment Action Plan (SEAP). The long-term development Vision 2022 is contained within the NDS. All other policies and strategies have been formulated to facilitate the vision of the NDS. The NDS identifies environmental protection as a cornerstone in the national development process.

Swaziland's policy response to environmental issues is presented in the following tables:

Existence of national policies, strategies and action plans for the environment	
Policy	**Review (strengths and weaknesses)**
Key Swaziland national policies, strategies and action plans for the environment are the following: National Development Strategy (1999) Swaziland Environment Action Plan (1997) National Land Policy (2000 draft) National Environment Policy (1999 draft) National Biodiversity Strategy and Action Plan (2001) National forestry Policy (2003)	The National Development Strategy sets out the framework for sustainable development in a comprehensive manner across all sectors. It is the umbrella strategy for all other policies and strategies. The Swaziland Environment Action Plan focuses *inter alia* on prioritizing environmental issues and solutions. Although the other key national environment related policies and strategies exist they do provide important guidance and support on environmental matters.

Swaziland has responded in its national policy framework with respect to addressing global environmental issues, of which the most relevant in this context are land degradation and desertification, decline of

biodiversity, climate change, food security, health, and poverty. However, it does not always have the technical or financial capacity to fully address these global issues. All the policies mentioned in connection with responding to national sustainability issues also cover the major global concerns. The related Millennium Development Goals of eradicating extreme poverty and hunger and ensuring environmental sustainability are represented in Swaziland's policy framework.

Policy response to environmental issues	
Environmental issue	**Review of policy response**
Land Degradation & Desertification High levels of land degradation are having a significant impact on resource management and productivity, in particular on rangelands.	The national policy response to land degradation has been to sign and ratify the Convention to Combat Desertification and to prepare the CCD National Action Plan. Countering land degradation is adequately addressed through the following national and sectoral policies and strategies: 2005 draft Comprehensive Agricultural Sector Policy 2005 draft National Food Security Policy 2003 National Rural Resettlement Policy 2002 National Forest Policy 2002 draft National Forestry Programme 1997 Swaziland Environment Action Plan 1995 Livestock Development Policy
Biodiversity degradation Unsustainable exploitation of biodiversity, conversion of ecosystems, loss of habitat, invasive alien infestations are rapidly reducing biodiversity. Less than 4% of the country is formally protected and managed.	The national policy response to biodiversity degradation has been to sign and ratify the Convention on Biological Diversity and some protocols as well as the preparation of the National Biodiversity Strategy and Action Plan, still in its 2001 draft form. Biodiversity conservation is adequately addressed in the following national and sector policies and strategies: 2008 Access and Benefit Sharing Bill 2008 Biosafety Policy 2005 draft Comprehensive Agricultural Sector Policy 2005 draft National Food Security Policy 2002 National Forest Policy 2002 draft National Forestry Programme 2001 National Biodiversity Strategy and Action Plan 1997 Swaziland Environment Action Plan
Climate change High vulnerability to climate change impacts particularly on vegetation, soils, biodiversity, productivity and livelihoods.	The national policy response to climate change has been to sign and ratify the United Nations Framework Convention on Climate Change and the Kyoto Protocol and the preparation of the First National Communication to the UNFCCC. Climate change impacts are partially addressed in the following national and sectoral policies and strategies: 2005 draft Comprehensive Agricultural Sector Policy 2005 draft National Food Security Policy
Land management Unsustainable land management practices are resulting in the rapid depletion of natural resources with impacts on productivity and livelihoods.	The national policy response to land management is through the related UN Conventions and the Millennium Development Goal 7: Ensure environmental sustainability. The issue of unsustainable land management is addressed comprehensively in the following policies: 2005 draft Comprehensive Agricultural Sector Policy 2003 National Rural Resettlement Policy 2000 draft National Land Policy 1997 Swaziland Environment Action Plan
Water management Poor management of surface water resources resulting in over utilization, reduced quality and quantity.	There is no specific national policy response to water management. The draft SADC Water Policy is serving as a guide for water management in Swaziland. A National Water Policy is due to be finalised by the end of 2009. An Integrated Water Resources Master Plan has been prepared and is being circulated for comment. The finalised Plan should be ready by mind-2010.

Policy response to environmental issues	
Environmental issue	**Review of policy response**
	The Water Act of 2003 currently provides legislative support for water management. Policy development is needed for rural water. Water management for irrigation purposes is adequately addressed in: 2006 draft National Irrigation Policy
Natural forest and woodlands Deforestation and degradation of forest resources for fuel wood, medicinal plants and land conversions is reducing the total area annually. Alien invasive plant species are infesting increasing areas of natural forest.	The national policy response to forest management is related to the signing and ratifying of the Convention on Biological Diversity. Forest management is adequately addressed in the following national and sector policies and strategies: 2002 National Forest Policy 2002 draft National Forestry Programme 2001 National Biodiversity Strategy and Action Plan 1997 Swaziland Environment Action Plan
Energy National energy demands are increasing pressure on forest resources for fuel wood resulting in deforestation.	The national policy response to energy is related to the signing and ratifying of the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change. Energy is adequately addressed in the following national and sector policies and strategies: 2009 National Biofuels Development Strategy and Action Plan 2003 National Energy Policy 2002 draft National Forestry Programme 2001 National Biodiversity Strategy and Action Plan 1997 Swaziland Environment Action Plan
Pollution & waste management Lack of management, control and monitoring	The national policy response to pollution & waste management is related to the signing and ratifying of the 1992 Basel Convention on the Transboundary Movement of Hazardous Wastes and their Disposal. Pollution & waste management is adequately addressed in the following national and sector policies and strategies: 2003 National Solid Waste Management Strategy 1997 Swaziland Environment Action Plan

3.2 CROSS-SECTORAL CO-ORDINATION

A description of the extent to which biodiversity has been integrated into sectoral and cross-sectoral strategies and plans providing concrete examples

There are three key institutions with environmental responsibilities: the Swaziland Environment Authority (SEA), the Swaziland National Trust Commission (SNTC) and the Ministry of Agriculture (MOA).

The supreme institution is the Swaziland Environment Authority, established in 1992 and responsible for environmental policy making, legislation, planning, environmental protection, monitoring and enforcement using provisions of the Environment Management Act. The SEA is a parastatal institution that exists both within and outside government control. It is responsible for coordinating all national environmental responses and is the official national representative at international environmental fora.

Supporting the SEA, SNTC and MOAC are numerous government and non-governmental institutions with varying levels of responsibility for environmental management.

3.2.1 CROSS-SECTORAL BIODIVERSITY COORDINATION IN NATIONAL PLANS AND STRATEGIES

The Biodiversity Conservation and Management Policy recognises that to implement the CBD successfully requires integration of the conservation and sustainable use of biodiversity into relevant sectoral or cross-sectoral plans, programmes and policies.

For Swaziland to manage its biodiversity effectively and meet its obligations under the CBD requires the participation and co-operation of various national Ministries. These Ministries should incorporate relevant biodiversity issues into their strategic and annual development plans and allocate appropriate budgets for biodiversity management activities. The SEA should play a central co-ordinating and monitoring role to ensure Ministries have considered biodiversity (and the many other environmental issues) in their work plans, strategies, policies and plans.

In terms of the Environmental Management Act, each Ministry is to submit to the SEA for approval an Environmental Management Strategy (EMS).

Each Strategy shall include the following:

1. a description of the principal effects that the activities regulated by the Government Ministry have or may have on the environment and the sustainable management of natural resources;

2. a description of the principal effects that the activities of the Government Ministry have or may have on the environment and the sustainable management of natural resources;

3. a statement of the objectives of the Strategy, which shall be designed to further the achievement of the purpose of this Act and the National Environmental Action Plan referred to in section 30; and

4. a description of the practical measures that the Government Ministry will take to give effect to the purpose of the Act and to ensure that it exercises its functions in a way that helps to achieve the objectives of the Strategy.

Each Government Ministry is expected to review its Environmental Management Strategy at least once every three years and shall publish a report on that review in the Gazette. Each review report shall include:

1. an assessment of the effects that activities in the sector regulated by the Government Ministry have had on the environment and the sustainable management of natural resources over the previous five years, and an assessment of future trends in this regard;

2. an assessment of the effects that the activities of the Government Ministry have had on the environment and on the sustainable management of natural resources, over the previous five years;

3. an assessment of the extent to which the objectives of the Strategy have been achieved and the effectiveness of the Strategy in assisting the Ministry to apply the principles set out in section 5;

4. recommendations for improving the Strategy; and

5. proposed amendments to the Strategy or a draft of a new Strategy that takes into account the assessments noted in the review.

To date no EMS's have been prepared by any ministry.

3.2.2 THE ADOPTION OF THE ECOSYSTEM APPROACH IN SECTORAL AND CROSS-SECTORAL STRATEGIES, PLANS AND PROGRAMMES

At COP 5 in 2000, the ecosystem approach was endorsed and it was recommended that parties apply this approach. The CBD defines the ecosystem approach as "a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Application of the ecosystem approach will help to reach a balance of the three objectives of the Convention: conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources".

The COP 5 decision further notes that the ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organisation which encompass the essential processes, functions and interactions among organisms and their environment. It recognises that humans, with their cultural diversity, are an integral component of ecosystems. The approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and an incomplete knowledge or understanding of their functioning.

An ecosystem approach to the management of environmental resources has been adopted by Swaziland however, its formal application or implementation is gradually taking place though regional programmes under the Trans-frontier Conservation and Resource Area Protocol.

There is recognition within Swaziland of inter-linkages between biodiversity and business and the need to mainstream biodiversity priorities into the policies, plans and activities across a range of stakeholders whose core business is not biodiversity, but whose day-to-day activities impact on biodiversity. This recognition is reflected in the NBSAP which includes several objectives and targets aimed at key production sectors, with agriculture, forestry and mining highlighted as production sectors with a significant impact on biodiversity.

To reduce the pressure on biodiversity caused by the agriculture, the biodiversity sector has in recent years started to engage with businesses to establish partnerships with the initiatives aimed at enhancing sustainable production through the development and implementation of best practice guidelines and other mechanisms. The guidelines seek to increase long-term productivity without compromising the environment while also contributing to socio-economic development. The sugarcane sector is the most important sector at this time as its direct impact on terrestrial and aquatic ecosystems is highly damaging. Various initiatives to better manage local environmental resources are being discussed. Irrigated agriculture, particularly the cultivation of virgin soil, has been the single biggest cause of irreversible habitat loss in the Lowveld area of Swaziland. However, a complex legislative environment and administrative fragmentation inhibit the coherent, consistent and effective incorporation of biodiversity considerations in agricultural decision-making. EIAs remain the only tool available to consider and assess the scale of impact but as mentioned the level of detail, scope and analysis of field surveys, varies widely allowing for agricultural developments to proceed when perhaps they should not, particularly as originally conceived.

3.2.2.1 BIOREGIONAL AND ECOSYSTEM PROGRAMMES

Swaziland has been included in several bioregional and ecosystem programmes in priority biomes under threat. These multi-stakeholder initiatives aim to secure the conservation of priority biodiversity within a specific biome or bioregion and include a high-level vision, strategy and action plan that co-ordinates several site-specific projects that address conservation, social and economic needs.

A funding proposal for biodiversity conservation targeted at the NGO and private sector has been prepared that will be used to help prioritise projects for funding by the Critical Ecosystem Partnership Fund (CEPF). CEPF is a large international fund that provides grants specifically for NGOs and private sector based on project proposals submitted to help protect the Earth's biologically richest and most endangered regions (global hotspots). The CEPF is designed to facilitate rapid and flexible funding to areas where globally significant biodiversity is under the greatest threat in a way that adds incremental value to existing initiatives and that the outcomes realized through its investments are sustained.

The CEPF Donor Council is reviewing the funding proposal for the Maputaland-Pondoland-Albany Hotspot that includes southern Mozambique, Eastern Cape Province, eastern Swaziland and Kwa-Zulu Natal as a priority for funding starting in 2010 and an Ecosystem Profile for this has been prepared as part of the funding request. The success or otherwise of this funding proposal is not yet known.

CEPF investment will complement existing funding in these priority areas and support the following strategies as investment priorities:

- Strengthening protected area management effectiveness through civil society partnerships that unblock current constraints to achieving conservation objectives;
- Development of conservation agreements that expand protected areas, improve land use and management outside protected areas, and provide landowner benefits. This includes piloting innovative payment for ecosystem services (PES) schemes;
- Improving enforcement of development and other environmental regulations to maintain functional ecosystem corridors, particularly rivers, within the production matrix; and
- Engaging business to actively contribute to conservation outcomes through improved practices and conservation set-asides.

If funding is secured, yet to be identified parts of eastern Swaziland, notably the Lubombo Conservancy area in north east Swaziland, will receive funding to better conserve and manage biodiversity hotspots. Exact details of how this will happen are pending and being discussed.

With its partners, Swaziland has been able to access funding secured by South Africa, particularly from the Global Environment Facility (GEF), to initiate and undertake the Transfrontier Conservation and Resource Area (TFCA) programmes.

Swaziland is participating in the regional Transfrontier Conservation and Resource Area programme and is working with neighbouring countries to declare and oeprationalise four trans-frontier parks – the Lubombo Conservancy-Goba TFCA, the Lubombo Nsubane-Pongola TFCA, Usuthu-Tembe-Futi TFCA and the Songimvelo-Malolotja TFCA.

TFCA's offer opportunities for community involvement and private sector participation which is critical in the design and implementation of TFCA initiatives. The active involvement of the different tourism authorities from the three countries in the initiative successfully complements their implementation. The cross border collaboration presents an opportunity for the country to tap into tourism flows to and from South Africa and Mozambique, e.g. the upcoming 2010 world Cup. The Bulembu Asbestos Mine tourism developments present an opportunity to be part of the initiatives of this TFCA. The Maguga Dam and surrounding areas present another opportunity to further activate the TFCA.

The four TFCAs are:

Lubombo Conservancy-Goba TFCA

The major objective is to promote sustainable economic development and the sustainable utilisation of natural resources in the Area for the benefit of present and future generations by identifying and establishing appropriate and viable economic activities and initiatives in the area.

Achievements

- Malarial Control Program is successful, making the area more visitor-friendly
- Completion of Mhlumeni Border and Siteki-Mhlumeni Road
- Tourism Complex at Mlawula Nature Reserve
- Shewula Camp and Nature Reserve is representation of community-based conservation and development.
- Appointment of TFCA Programme Manager beginning August 2004
- Reconstitution of Task Team
- Finalization of Concept Document and Action Plan
- Held preliminary meetings with stakeholders on future of the TFCA
- Opening of the Mhlumeni-Goba border

Nsubane-Pongola TFCA

The major objective of the Nsubane Pongola TFCA is to realize economic returns from tourism and associated activities within the Area, while safeguarding its ecological integrity, and to promote the sustainable socio-economic development of the Area, for the benefit of all Parties and to develop, market and promote the TFCA to this end.

Achievements

- Appointment of TFCA Programme Manager beginning August 2004
- Malarial Control Program is successful, making the area more visitor-friendly
- Reconstitution of Task Team
- Finalization of Concept Document and Action Plan
- Held preliminary meetings with stakeholders on future of the TFCA
- The launching of the E3.5 Royal billion Jozini Big 6 project (see www.royaljozini.com)

Songimvelo-Malolotja TFCA

The Songimvelo-Malolotja TFCA is located on the South Africa-Swaziland border between Barberton (SA) and Pigg's Peak (Swaziland) and covers an area of approximately 700km², with potential extensions of another 500km². The core of the TFCA is formed by the 49 000 ha Songimvelo Game Reserve (SA) and 18 000 Ha Malolotja Nature Reserve (Swaziland) which share a common border. The other identified core areas on the Swaziland side are three protection-worthy areas, namely the Bulembu, Makhonjwa, and Sondeza National Landscapes. The local communities within and around these areas also form part of the initiative. This TFCA is to be incorporated as part of the greater Lubombo TFCA.

The major objective is to collaboratively establish and manage on a sustainable basis a viable trans-frontier conservation area with stakeholder participation, including local communities, fostering regional cooperation, biodiversity conservation, and cross-border socio-economic development. This TFCA was formalized in March 2004 by the trilateral Ministerial Committee in Swaziland, making it part of the Lubombo TFCRA.

Achievements

- Appointment of TFCA Programme Manager beginning August 2004
- Reconstitution of Task Team
- Finalization of Concept Document and Action Plan
- Held preliminary meetings with stakeholders on future of the TFCA
- Cooperation on elephant management and control already underway
- Joint tourism master plan, zonation and management plans are currently under development under the auspices of the Peace Parks Foundation

Usuthu-Tembe-Futi TFCA incorporating Usuthu Gorge

Covering an area of approximately 22958.39 acres (9290.97 hectares or 92.9 km2), this area lies in the Lubombo region, along the south of the Lubombo mountains and is bordered by the Greater Usuthu river in the South where it dissects the Ubombo mountain, thus the name "Usuthu Gorge". The core tourism area covers an area of approximately 5892.39 acres (2384.57 hectares or 23.85 km2). The Great Usutu River (Lusutfu) carves an impressive gorge through the Lubombo Mountains as it exits Swaziland. High cliffs adorned with cycads and abundant birdlife are features of this 8km long gorge, which is wild and uninhabited. Important wildlife species that have been spotted in this area include kudu, side-striped jackals, oribi and mountain reedbuck, among others. The river itself is Swaziland's largest watercourse and its waters are navigable by raft or canoe for most months of the year, although huge crocodiles are known to frequent the long pools between rapids. Sandy beaches occur at frequent intervals. The major vegetation types include mixed forests and woodlands, including bushveld. The Mowane gorge in this area is also a sacred site in Swazi culture.

Songimvelo-Malolotja TFCA

The Usuthu Gorge, apart from being a link for the Usuthu-Tembe-Futi Transfrontier Conservation Area and the Lubombo Spatial Development Initiative, is in itself a fantastic area with wilderness qualities that are rare in Swaziland. The Lunkuntfu (Mambane) community, who live predominantly at the base of the Lubombo Mountains under the Nkilongo Inkhundla are well positioned to benefit from development in this area.

The Usuthu-Tembe-Futi TFCA links to the eastern end of this area. At its exit from Swaziland, the Ndumo-Tembe area is visible a few kilometres downstream and with the potential for border crossing formalities to be accommodated by the LSDI process, there exists a unique opportunity for water rafting, canoeing or walking trail linkages to this area, as well as Southern Mozambique. The area falls almost alongside the Manzini-Big Bend-Lavumisa road, which is a major tourism route through Swaziland.

As expected in a rural area such as this, there are few roads. In terms of community needs, all there is need for is infrastructure as relates to water, schools and health-care facilities. The main land uses are cattle rearing and arable farming, maize being the major crop, most of which is for subsistence consumption. Natural resources such as thatching grass and firewood could be availed on a limited basis to the community in specific areas.

Achievements to date including a marked improvement in road networks within and between the TFCAs, the signing of the Lubombo Malaria Protocol which has seen a decline of some 90% in the incidences of malaria, commitment of investments within the TFCAs (a multi-billion Emalangeni (Rand) project currently under development on the Swaziland side of the Nsubane-Pongola TFCA is gradually developing infrastructure and facilities including purchase of stocking game), to ease the movement of people between the three countries, visa requirements were also dropped, thus enhancing cross-border tourism, and a process has started on developing area-specific Integrated Tourism Master Plans which involve all partner countries and stakeholders (Songimvelo-Malolotja TFCA plan and the joint management plans for the Songimvelo-Malolotja and Nsubane-Pongola TFCA).

3.2.3 BIODIVERSITY AWARE IMPACT ASSESSMENTS

As discussed in 2.5.3 Swaziland has not integrated biodiversity inclusive assessments into its existing EIA regulations. However, each EIA submitted to the SEA for review and approval has to include an assessment of biodiversity impacts that could result from the implementation of the activity being addressed by the EIA.

Problems surround the level of detail and scope to which biodiversity issues are identified and integrated into the EIA. It is common for EIAs to take a purely project focus to biodiversity impacts and rarely assess these in terms of the wider ecosystem or continuous threats to biodiversity.

Consultants who commonly undertake the preparation of these projects focused EIAs are not provided with much guidance from the SEA and other relevant agencies, on how to approach the biodiversity impact assessment resulting in various assessment approaches.

Swaziland researchers have continued to publish research papers, biodiversity related atlases and co-authored regional and international publications on a wide range of biodiversity topics. There are national publications describing the various components of biodiversity and ecosystems and research which now includes several books like the 2005 publication of the Swaziland Tree Atlas - including selected shrubs and climbers (Loffler, L. & Loffler, P. Southern African Botanical Diversity Network Report No. 35. SABONET, Pretoria), the 2009 Annotated Checklist of the Trees of the Lubombo Conservancy. (Loffler, L. & Braun, K. Natural History Society of Swaziland and Panasonic Swaziland, Mbabane), and the 2005 Nesting distribution of vultures in relation to land use in Swaziland (Monadjem A. & Garcelon D.. Biodiversity and Conservation). Recently Monadjem A. et al published a report on the roost selection and home range of an African insectivorous bat in and around the Mlawula Nature Reserve in north east Swaziland. There is now quite a diversity of literature relating to biodiversity in Swaziland much of which has been referenced in this report and can be found in the references.

3.2.4 ANALYSIS OF THE OUTCOMES

The mainstreaming of biodiversity into national initiatives and development plans has not consistently taken place. There is broad recognition of the overall importance of mainstreaming biodiversity but the tools and guidelines to facilitate such are lacking.

Swaziland's biodiversity, like that of its neighbours, is facing increasing threats from habitat destruction, fragmentation, alien invasive species, climate change and others and its becoming increasingly important to ensure that biodiversity protection and management are adequately reflected in national policies, plans and programmes.

The SEA supported by other national agencies, need to step up their engagement with national government structures, research institutions and national and regional experts to develop guidelines and procedures by which biodiversity is mainstreamed into national activities.

The NBSAP, as described in chapter 2, remains a draft and due to the lapse in time between its formulation and today, will require updating. This should provide an opportunity to improve its strategic objectives or integrating biodiversity in national programmes.

The link between healthy functioning ecosystems, economic development and social well-being is generally not well understood by planners and decision-makers and this lack of understanding is allowing activities to be implemented at a cost to biodiversity and ecosystem function. Apart from the lack of awareness about biodiversity, poorly capacitated institutions with inadequate corporate governance and individuals lacking relevant experience and skills hamper effective decision-making.

4 CONCLUSION

4.1 INTRODUCTION

This chapter draws together the information presented in the previous chapters to assess how actions taken at the national level have contributed towards achieving progress towards the 2010 target (section 4.2) and objectives of the Strategic Plan of the CBD (section 4.3) before presenting an overall conclusion (section 4.4).

4.2 PROGRESS TOWARDS 2010 TARGETS

In decision VI/26 the Conference of the Parties adopted the Strategic Plan for the CBD. In its mission statement, the Parties committed themselves to a more effective and coherent implementation of the CBD, to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth. This target was subsequently endorsed by the World Summit on Sustainable Development. In decision VII/30, COP adopted a framework to facilitate the assessment of progress towards the 2010 targets.

This is a flexible framework within which national and regional targets may be set and indicators identified. The Framework contains the following seven focal areas:

(a) Reducing the rate of loss of components of biodiversity including (i) biomes, habitats and ecosystems, (ii) species and populations, and (iii) genetic diversity;
(b) Promoting sustainable use of biodiversity;
(c) Addressing the major threats to biodiversity, including those arising from invasive alien species, climate change, pollution and habitat change;
(d) Maintaining ecosystem integrity and the provision of goods and services provided by biodiversity in ecosystems, in support of human wellbeing;
(e) Protecting traditional knowledge, innovations and practice;
(f) Ensuring the fair and equitable sharing of benefits arising from the use of genetic resources;
(g) Mobilising financial and technical resources, especially for developing countries, in particular least developed countries, small developing island states and countries with economies in transition, for implementing the CBD and Strategic Plan.

Swaziland has still to formulate a national strategy to achieve the 2010 biodiversity targets which should include its own sets of targets and indicators to monitor progress towards meeting the 2010 goals.

The general challenges experienced in developing targets and indicators have already been discussed in Chapter 1, and these challenges apply equally to the 2010 goals. Accordingly, the approach taken to reporting on progress is to provide appropriate commentary on progress and challenges for each of the goals and targets is presented in the following table.

4.2.1 2010 GOALS, TARGETS, INDICATORS AND PROGRESS

Goals and targets	Relevant CBD Strategic Plan indicators	Swaziland's progress
Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes		
Target 1.1: At least 10% of each of the world's ecological regions effectively conserved.	Coverage of protected areas	The NBSAP defines the following strategy as a measurable target "Modify existing protected areas network to protect 10% of the full range of ecosystems" however it does not define a time bound target although the NBSAP does have a broad timetable described as short to medium term. The primary challenge is the Swaziland National Trust Commission Act of 1973 used for establishing protected areas which has yet to be informed by recent initiatives in protected area management and IUCN categories. The SNTC have started a process of reviewing and updating their Act which should be ready in 2010. The Government is also in the process the formulation of a comprehensive biodiversity act which should be completed in 2010. The absence of a comprehensive land policy to guide development and land use severely limits the

Goals and targets	Relevant CBD Strategic Plan indicators	Swaziland's progress
		declaration of protected areas. Urban and rural settlement sprawl and new agricultural land developments are gradually taking over lands that, with good planning, could form new protected or managed areas. The absence of a policy relating to biodiversity management and conservation also hampers extending the protected areas network as there is no formal document to guide or provide a vision. No new protected areas have been declared since 1994 when the Mantenga Nature Reserve was proclaimed, though new areas are in the pipeline for proclamation: Phophonyane Nature Conservancy (600 ha), Muti Muti Nature Conservancy (6,000 ha) and Mlumati Nature Reserve (400 ha).
Target 1.2: Areas of particular importance to biodiversity protected	Trends in extent of selected biomes, ecosystems and habitats Trends in abundance and distribution of selected species Coverage of protected areas	The NBSAP recommends the protection of hot-spots of biodiversity for conservation of areas of particular importance to biodiversity. The NBSAP does not specifically provide for the conservation of species diversity rather it broadly calls for the extension of the protected areas network covering all ecosystems. Red Data Lists have been prepared for two groups of organisms: vertebrates and higher plants - one for plants (Dlamini & Dlamini 2002) and one for vertebrates (Monadjem et al. 2003). The former list has been updated for trees (Loffler & Loffler 2005).
Goal 2. Promote the conservation of species diversity		
Target 2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups	Trends in abundance and distribution of selected species Change in status of threatened species	No national target has been incorporated into national plans, programmes or strategies. No specific activity has taken place so far that will restore, maintain or reduce the decline of populations of species of selected taxonomic groups. Planned initiatives like the TFCA should in the near future begin to address actions. The country has set aside funding to review and update legislation that relates to the management of biological diversity. A new Biodiversity Bill and Policy was developed in 2008. This new piece of legislation will replace all current legislation relating to biological diversity including the Flora Protection Act of 2000 and others. The Swaziland National Trust Commission Act of 1972 (as amended in 1973) is still maintained but is being reviewed and the Environmental Management Act of 2003 does recognize the need for protection of biologically sensitive areas.

Goals and targets	Relevant CBD Strategic Plan indicators	Swaziland's progress
Target 2.2: Status of threatened species improved	Change in status of threatened species Trends in abundance and distribution of selected species Coverage of protected areas	Government agencies and national researchers have been involved in the publication of the Red Data Book of Vertebrates and Plants. Both books were published in the past decade. A revision of these two books would allow the comparison of threatened species across a 10-year time frame. This would enable the country to comment on whether the status of threatened species has improved, worsened or remained the same.
Goal 3. Promote the conservation of genetic diversity		
Target 3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained	Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance Biodiversity used in food and medicine Trends in abundance and distribution of selected species	No national target has been incorporated into national plans, programmes or strategies. The Plant Genetic Resources Centre has been established but it is under resourced. A Botanic Garden is in the process of being established, however resources are delaying its construction. A National Tree Seed Centre was established in 1994 but it is also under resourced. A Traditional Healer's Clinic was opened in 2009 in the north of the country, and is the first of its kind in Swaziland. This clinic will help to mainstream the use of traditional medicine in the country. However, the indigenous nursery which was designed to supply the clinic with plants has not been successful. The sustainable production of indigenous plants for traditional medicinal use is an urgent requirement in the country, and should involve the practitioners themselves. Research in South Africa indicates that increasing demand for traditional plants has lead to local extinctions and that many of these plants are now being sourced in Swaziland (Mander??). A policy and strategy for the production, use and exportation of traditional medicinal plants should be formulated.
Goal 4. Promote sustainable use and consumption		
Target 4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity	Area of forest, agricultural and aquaculture ecosystems under sustainable management Proportion of products derived from sustainable sources Trends in abundance and distribution of selected species Nitrogen deposition Water quality in aquatic	Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity have received recent attention. A small marula oil processing factory, Swazi Secrets, was established in 2005 to manufacture a small range of marula oil based products like soap, cream and the oil itself. The harvesting of the raw material is carried out by local communities and the seed sold to the factory. Other natural sources of useable oils are being investigated.

Goals and targets	Relevant CBD Strategic Plan indicators	Swaziland's progress
	ecosystems	
Target 4.2. Unsustainable consumption of biological resources, or that impacts upon biodiversity, reduced	Ecological footprint and related concepts	The unsustainable consumption of biological resources or activities that impact upon biodiversity is a serious concern to the country. Swaziland relies extensively upon its natural resources and efforts to raise awareness of the importance of these resources are on-going. The introduction of mandatory EIAs in 1997 has gone some way to reduce the impact but such EIAs only focus on specific projects and activities and though the EIA may warn of biodiversity loss or impact, the resulting projects often impact upon the biodiversity. Biodiversity inclusive EIAs should be encouraged and clear guidance on mitigating losses or impacts upheld. Greater emphasis is needed to identify the key components currently threatened and mitigation developed to reduce the unsustainable consumption. Concerns on possible over-harvesting of certain species, such as cycads and medicinal plants, due to illegal harvesting. The Ministry of Tourism and Environmental Affairs together with the SNTC are cracking down on the sale of roadside firewood sales as part of its climate change actions and efforts to reduce deforestation. The Minister of Tourism and Environmental Affairs, Macford Sibandze, has threatened to take legal action against people found to be cutting down trees for commercial gain, including firewood vendors.
Target 4.3: No species of wild flora or fauna endangered by international trade	Change in status of threatened species	As a signatory to CITES, trade in species of wild flora or fauna is regulated. The Flora Protection Act of 2000 provides for penalties for the unlawful picking of protected flora, the unlawful sale of protected flora, and the prohibition of export any protected flora, except upon or subject to the conditions of a permit issued by the Minister. Any person who contravenes these provisions or unlawfully cuts, picks, plucks, gathers, uproots, injures, breaks and process any flora in schedule A of the Act is guilty of an offence and on conviction liable to a fine of not less than six hundred Emalangeni and not more than two thousand five hundred Emalangeni or a term of imprisonment of not less than three months and not more than two years. The Game (Amendment) Act of 1991 allows the Minister responsible for Agriculture to declare any specified area of Swaziland to be a sanctuary for the protection of any animals or birds. Any person who in any sanctuary hunts or attempts to hunt any animal

Goals and targets	Relevant CBD Strategic Plan indicators	Swaziland's progress
		or bird protected within the sanctuary, or takes any trophy of any such animal or bird, or who is found within a sanctuary under circumstances which show he is there for the purpose of hunting or taking trophy of any such animal or bird therein shall be guilty of an offence. Any person who contravenes the provisions of sections 6(2) or (5), 7(1), 12(1), 13, 14 or 20(1), (2) or (3) of the Act shall on conviction be liable to a fine of not less than six hundred Emalangeni but not exceeding two thousand Emalangeni or to imprisonment for a period of not less than six months but not exceeding two years.
Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced		
Target 5.1. Rate of loss and degradation of natural habitats decreased	Trends in extent of selected biomes, ecosystems and habitats Trends in abundance and distribution of selected species	Pressures from habitat loss, land use change and degradation, and unsustainable water use are having a significant impact on biodiversity in the country. Land use change, primarily to agriculture, is, despite EIA enforcement, reducing natural habitats. Degradation of habitat through climatic change, drought and settlement expansions has markedly affected the integrity of many habitats. Indicators for habitat degradation caused by invasive alien plants to be developed as part of Biodiversity Conservation and Management Bill.
Goal 6. Control threats from invasive alien species		
Target 6.1. Pathways for major potential alien invasive species controlled	Trends in invasive alien species	The draft NBSAP under strategy 4.1 for biodiversity conservation through the improvement of the protected areas network sub-strategy 3 (minimize the impact of alien invasive species) identifies the following priority actions: incorporate control measures of alien invasives into the management plan of each protected area and conduct a national assessment of, and develop cost effective control techniques for, alien invasives. A project was carried out in 2003/2004 under the auspices of the Swaziland Environment Authority, to compile existing data on alien invasive plants of Swaziland. One product of this project was the creation of an online database of Swaziland's alien/non-indigenous plants, with distribution maps and photographs or illustrations [http://www.sntc.org.sz/alienplants/index.asp]. A booklet of the invasive alien plant species was prepared, and will be published when funding is available. In 2009 Government started preparing an Invasive Alien Plants Strategy to provide strategic guidance on

Goals and targets	Relevant CBD Strategic Plan indicators	Swaziland's progress
		how to combat the ever increasing threat. Within private industrial timber plantations and sugarcane estates some effort is made to prevent their commercial tree species from invading lands outside their jurisdiction. The Ministry of Agriculture has undertaken some training of extension officers in plant identification, eradication and control in rural areas. Within and around protected areas *ad hoc* efforts in control of invasive aliens occurs. Some commercial farmers and private land owners undertake their own localized eradication programmes. Mitigation plans prepared as part of the EIA processes in the country, always call for mitigation and monitoring of invasive aliens in the area of the project. Indicators for habitat degradation caused by invasive alien plants to be developed as part of Biodiversity Conservation and Management Bill.
Target 6. 2. Management plans in place for major alien species that threaten ecosystems, habitats or species	Trends in invasive alien species	The development of management plans for the major alien species that threaten ecosystems, habitats or species has been limited by funding. In 2009 Government started preparing an Invasive Alien Plants Strategy to provide strategic guidance on how to combat the ever increasing threat. There is a schedule of noxious weeds in the existing legislation, part of the Plant Control Act 1981, which replaced the (very) old Noxious Weeds Act of 1929.
Goal 7. Address challenges to biodiversity from climate change, and pollution		
Target 7.1. Maintain and enhance resilience of the components of biodiversity to adapt to climate change	Connectivity/fragmentation of ecosystems	Indicators related to climate change are still to be developed. In the country's first national communication to the UNFCCC the impact of climate change on biodiversity was reviewed. It identified that "Natural resources and biodiversity, on future types of ecosystems, tree growth, distribution and mortality of species" are climate sensitive and hence highly at risk. The communication identified that drought conditions will impact negatively on biodiversity. Stakeholders with primary interest in conserving and managing the country's biodiversity are broadly unaware of the impending crisis and impact and greater efforts are needed to specifically identify the biodiversity threats and develop appropriate mitigation. The second national communication to the UNFCCC is

Goals and targets	Relevant CBD Strategic Plan indicators	Swaziland's progress
		under preparation.
Target 7.2. Reduce pollution and its impacts on biodiversity	Nitrogen deposition Water quality in aquatic ecosystems	Biodiversity-related Indicators on pollution to still to be developed. The impact of pollution of biodiversity has not been adequately researched and existing data is limited. The impact of pollution of aquatic biodiversity is the only component that has had any significant research. Industrial emissions and industrial accidents pose a grave risk to aquatic biodiversity. The Water Act of 2003 contains several enforcement measures to manage water-borne pollution and contamination though due to capacity constraints, is seldom enforced.
Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods		
Target 8.1. Capacity of ecosystems to deliver goods and services maintained	Water quality in aquatic ecosystems Incidence of human-induced ecosystem failure	The management of ecosystems to deliver goods and services has not received the priority it deserves. Irrigation of sugarcane consumes close to 95% of the country's surface water resources which in turn are derived from highland areas. Degradation of these vitally important catchment areas is on-going through agricultural expansion, industrial timber plantations and alien plants infestations. The 2003 Water Act does require a Water Resources Master Plan to be developed that would include an inventory of the total water resources of Swaziland and a comprehensive programme of action in which the maximum value can be obtained from this resource for the benefit of the people of Swaziland. The Plan will include the generally accepted principles of integrated water resource management. The Integrated Water Resources Master Plan has been prepared (2009) and is being circulated for comment. Water pollution and its causes and mitigation form part of the IWRM Plan.
Target 8.2. Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained	Health and well-being of communities who depend directly on local ecosystem goods and services Biodiversity used in food and medicine	Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people still need to be identified and quantified. There is a high level of reliance by local communities on natural resources for food, fuel and medicine.
Goal 9. Maintain socio-cultural diversity of indigenous and local communities		
Target 9.1. Protect traditional	Indicators to be developed	The Biodiversity Conservation and Management Bill, Biosafety Act (2007) and the Access and Benefit

Goals and targets	Relevant CBD Strategic Plan indicators	Swaziland's progress
knowledge, innovations and practices		Sharing Bill (2008) to regulate access to genetic resources and the sharing of benefits.
Target 9.2. Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit sharing	Indicators to be developed	Progress as above.
Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources		
Target 10.1. All access to genetic resources is in line with the CBD and its relevant provisions	Indicators to be developed	Modalities to ensure the fair and equitable sharing of benefits arising out of the use of genetic resources are still being developed. Swaziland signed the International Treaty on Plant Genetic Resources for Food and Agriculture on 10 June 2002. The Biodiversity Conservation and Management Bill, Biosafety Act (2007) and the Access and Benefit Sharing Bill (2008) to regulate access to genetic resources and the sharing of benefits.
Target 10.2. Benefits arising from the commercial and other utilisation of genetic resources shared in a fair and equitable way with the countries providing such resources in line with the CBD and its relevant provisions	Indicators to be developed	Progress as above.
Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention		
Target 11.1. New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments	Official development assistance provided in support of the Convention	The country has received financial assistance from several sources such as the GEF and IUCN to improve its capacity to effectively manage the country's biological resources. The level of funding received has not made a significant impact but has facilitated specific activities to address biodiversity loss and management. Financial support received from GEF as part of the

Goals and targets	Relevant CBD Strategic Plan indicators	Swaziland's progress
under the Convention, in accordance with Article 20		regional TFCA programme.
Target 11.2. Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4	Indicator to be developed	No technology transfers have occurred from Swaziland to other Parties.

4.3 PROGRESS TOWARDS GOALS AND OBJECTIVES OF THE STRATEGIC PLAN

Strategic goals and objectives	Possible CBD indicators	Swaziland's progress
Goal 1: The Convention is fulfilling its leadership role in international biodiversity issues		
1.1 The Convention is setting the global biodiversity agenda	CBD provisions, COP decisions and 2010 target reflected in workplans of major international forums	These goals are to be achieved at the Convention level, not the national level.
1.2 The Convention is promoting co-operation between all relevant international instruments and processes to enhance policy coherence		
1.3 Other international processes are actively supporting implementation of the Convention, in a manner consistent with their respective frameworks		
1.4 The Cartagena Protocol on Biosafety is widely implemented		Swaziland has formulated a Biosafety Policy. Developed a Bill which has been recently gazetted and tabled in parliament. Currently, Regulations for the Bill are being developed as well.
1.5 Biodiversity concerns are being integrated into relevant sectoral or cross-sectoral plans, programmes and policies at the regional and global levels	Number of regional/global plans, programmes and policies which specifically address the integration of biodiversity concerns into relevant sectoral or cross-sectoral plans, programmes and policies Application of planning tools such	Biodiversity is gradually being incorporated into national strategies and plans – refer to section 3.2.1. Efforts have been made to incooperate biodiversity concerns in the drafting of the National Development Biofuels

Strategic goals and objectives	Possible CBD indicators	Swaziland's progress
	as strategic environmental assessment to assess the degree to which biodiversity concerns are being integrated Biodiversity integrated into the criteria of multilateral donors and regional development banks	Strategy and Action Plan. Swaziland is a signatory of the SADC protocols on Wildlife, Water and Forests
1.6 Parties are collaborating at the regional and subregional levels to implement the Convention	Number of Parties that are part of (sub-) regional biodiversity-related agreements	Swaziland is active in regional co-operation with SADC countries through various structures and protocols, as well as being party to agreements with its neighbours on shared water resources and Trans-frontier Conservation Areas
Goal 2: Parties have improved financial, human, scientific, technical, and technological capacity to implement the Convention		
2.1 All Parties have adequate capacity for implementation of priority actions in national biodiversity strategy and action plans		The 2005 National Capacity Self Assessment highlighted capacity constraints. Not much effort has been made to integrate the various recommendations into activities.
2.2 Developing country Parties, in particular the least developed and the small island developing States amongst them, and other Parties with economies in transition, have sufficient resources available to implement the three objectives of the Convention	Official development assistance provided in support of the Convention	Generally the country suffers from insufficient resources available to implement the three objectives of the Convention.
2.3 Developing country Parties, in particular the least developed and the small island developing States amongst them, and other Parties with economies in transition, have increased resources and technology transfer available to implement the Cartagena Protocol on Biosafety		Generally the country suffers from insufficient resources and technology transfer to implement the Cartagena Protocol on Biosafety. The country has developed a Biosafety Bill that will assist access to international funds.
2.4 All Parties have adequate capacity to implement the Cartagena Protocol on Biosafety		Capacity building and Biosafety awareness. Risk Assessment training of the National Biosafety Advisory Committee and other stakeholders was conducted. Rules and Regulations for implementation of the Bill are being finalized. Efforts are on-going to develop institutional and human capacity working in the area of Biotechnology.
2.5 Technical and scientific co-operation is making a significant contribution to building capacity		In general technical and scientific cooperation is lacking.

Strategic goals and objectives	Possible CBD indicators	Swaziland's progress
Goal 3: National biodiversity strategies and action plans and the integration of biodiversity concerns into relevant sectors serve as an effective framework for the implementation of the objectives of the Convention		
3.1 Every Party has effective national strategies, plans and programmes in place to provide a national framework for implementing the three objectives of the Convention and to set clear national priorities	Number of Parties with national biodiversity strategies	The country has not finalised its NBSAP but efforts are on-going to secure additional funding to review and finalise the Plan. Refer to section 2.4.
3.2 Every Party to the Cartagena Protocol on Biosafety has a regulatory framework in place and functioning to implement the Protocol		Swaziland has developed a National Biosafety Framework that has been endorsed by cabinet. A Biosafety Bill to operationalize the framework is now in Parliament. Regulations are being formulated to further put the Bill into practicality.
3.3 Biodiversity concerns are being integrated into relevant national sectoral and cross-sectoral plans, programmes and policies	Percentage of Parties with relevant national sectoral and cross-sectoral plans, programmes and policies in which biodiversity concerns are integrated	Efforts are on-going to integrate biodiversity concerns into national sectoral and cross-sectoral plans, programmes and policies.
3.4 The priorities in national biodiversity strategies and action plans are being actively implemented, as a means to achieve national implementation of the Convention, and as a significant contribution towards the global biodiversity agenda	Number of national biodiversity strategies and action plans that are being actively implemented	The country has not finalised its NBSAP but efforts are on-going to secure additional funding to review and finalise the Plan. Refer to section 2.4.
Goal 4: There is a better understanding of the importance of biodiversity and of the Convention, and this has led to broader engagement across society in implementation		
4.1 All Parties are implementing a communication, education, and public awareness strategy and promoting public participation in support of the Convention	Number of Parties implementing a communication, education and public awareness strategy and promoting public participation Percentage of public awareness programmes/projects about the importance of biodiversity Percentage of Parties with biodiversity on their public school curricula	The NBSAP strategy 4.5 for Improving the Institutional and Legal Frameworks and the Human Resources for Conservation and Sustainable Use and 4.6 for Enhancing public awareness of the value of, and need for, biodiversity conservation acknowledges the importance of communication and awareness raising as critical tools to ensure a broader commitment to biological diversity management. Refer to section 2.4. The National Environmental Education Programme (NEEP), started in 1975, continues to provide environmental education through three Environmental Education Centres. The SNTC

Strategic goals and objectives	Possible CBD indicators	Swaziland's progress
		together with NEEP continue to expand through introduction of community outreach programmes.
4.2 Every Party to the Cartagena Protocol on Biosafety is promoting and facilitating public awareness, education and participation in support of the Protocol	As above	The National Biosafety Bill contains provisions that facilitate public participartion in decision making on biosafety issues. A national awareness on Biosafety for both the public and private sector has been done. In an effort to facilitate education and public participation, the Bill is currently being translated to our local indigenous language and material development for public use is underway.
4.3 Indigenous and local communities are effectively involved in implementation and in the processes of the Convention, at national, regional and international levels	As above	Indigenous and local communities are involved in the implementation of the CBD to a limited extent.
4.4 Key actors and stakeholders, including the private sector, are engaged in partnership to implement the Convention and are integrating biodiversity concerns into their relevant sectoral and cross-sectoral plans, programmes and policies	Number of stakeholders engaged in partnerships	Stakeholders such as NGOs and the private sector are involved to some extent in implementation of the CBD through implementing various programmes that support achievement of the CBD objectives.

4.4 CONCLUSIONS

4.4.1 OVERALL ASSESSMENT OF IMPLEMENTATION OF THE CBD

Swaziland continues to try and improve the approaches it has to raise the profile of biodiversity conservation, management and sustainable utilisation in support of the CBD. In particular, the development of new policy and legislation has allowed Swaziland better address the needs.

The lack of a finalised NBSAP is hindering progress and extra effort is needed to review and then finalise the Plan.

Swaziland has made some progress particularly with the participation in a number of bioregional programmes with a strong focus on the ecosystem approach and on mainstreaming. The development of tools for mainstreaming biodiversity in land-use planning and environmental assessment are still to be addressed and formulated.

Swaziland continues to faces many challenges with implementing the CBD to achieve its principal objectives. Such challenges are in funding, priorities given to poverty reduction and long term impacts of drought and fiscal policy insecurity. Stiff competition for national funding for biodiversity conservation and management has resulted in biodiversity taking a back seat whilst other official priority initiatives receive funding. Human capacity is a key constraint, and shortfalls in financial resources present a challenge.

The country has managed to prepare a legislative and policy framework around which the objectives of the Convention can be integrated into its development plans and activities. The slow pace of formulation and finalisation has meant that several initiatives have still to become official government doctrine.

If Swaziland can successfully finalise its NBSAP and begin its implementation, it will have made substantial progress in meeting its obligations under the CBD. However, there is no room for complacency and much effort is required by all stakeholders before it can be claimed with confidence that the CBD objectives are being achieved – the limited progress in meeting the 2010 targets provides a strong reminder of the challenges that lie ahead.

4.4.2 LESSONS LEARNED

The lessons learnt on implementation of the CBD have been alluded to in the body of this report. In particular, the challenges in mainstreaming biodiversity and implementing cross-cutting programmes and should be highlighted.

Key challenges that have been discussed include cross-sector co-ordination, the project focussed EIA process that does not consistently address biodiversity concerns, funding for biodiversity conservation and capacity constraints are all challenges that are hampering progress.

From regional literature, its obvious that many SADC countries are facing similar problems but some, notably South Africa with is large pool or technical expertise and a government committed to biodiversity conservation and management (as it relates to promoting a thriving tourism sector) could provide valuable lessons that Swaziland could consider.

The bioregional and ecosystem programmes that Swaziland is increasingly becoming part of, is providing the country opportunities to improve its biodiversity governance but more is still needed.

4.4.3 FUTURE PRIORITIES AND CAPACITY-BUILDING NEEDS

Swaziland has managed to establish a conducive policy and legislative framework for biodiversity management but it remains to be seen how effectively these instruments can be implemented.

The National Capacity Self-Assessment process that ended in 2005 identified various areas urgently requiring improvement and strengthening but to date little attention has been paid to implementing them. National financial resource constraints are the key obstacle for effective implementation.

The NCSA review noted the following capacity needs:

(1) Low levels of awareness and knowledge limit the ability for discussion, decision-making and action.
(2) Lack of information management, monitoring and observations hampers policy and decision-making.
(3) Lack of synchronization of national policy, legal and regulatory frame-works leads to confusion between sectors and between national, regional and local levels.
(4) Incentive systems and market instruments are inadequately developed.
(5) Institutional mandates either overlap or have gaps, key institutions are not involved, and interactions between institutions are not always effective.
(6) Science and technology are ineffectively mobilized in support of policy and decision-making.
(7) Preparing for, skill in participating in, and reporting back on, international negotiations and agreements is weak.
(8) Coordination, and processes for interaction within the country are poorly developed.
(9) Cooperation and networking within regions is often lacking.
(10) Individuals tend to be ineffectively deployed, mobilized, motivated or given responsibility.
(11) Institutional effectiveness is hampered by weak management and resource constraints.
(12) Lack of financial resources and technology

4.4.4 SUGGESTIONS FOR ACTION

The limited financial capacity of Swaziland to re-direct resources from national development priorities seeking a broader and urgent socio-economic improvement is taking place at the expense of the country's biodiversity. With the emergence of climate change and all its inherent impacts, there is a need to leap frog national

resource constraints through supplemental funding from donor agencies. A greater level of effort is needed to identify and securing international funding to implement biodiversity related initiatives thus leaving the bulk of available government finance for their stated priorities.

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6 ANNEXES

Annex 1 - Reporting Party and Report Preparation

A. Reporting Party

Contracting Party	Swaziland Government
NATIONAL FOCAL POINT	
Full name of the institution	***Ministry of Tourism and Environment Affairs*** ***Swaziland Environment Authority***
Name and title of contact officer	***Mr. Jameson D. Vilakati*** ***The Executive Director***
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CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	***Ministry of Tourism and Environment Affairs*** ***Swaziland Environment Authority***
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E-mail	***szuke@sea.org.sz***
SUBMISSION	
Signature of officer responsible for submitting national report	
Date of submission	***15 January 2010***

B. Report Preparation

The Fourth National Report to the Convention of Biological Diversity was prepared during the period October 2009 to November 2009. The Swaziland Environment Authority (SEA) led the process of drafting the report, with close assistance and co-operation from the Swaziland National Trust Commission. An independent consultant, Mr Rex Brown supported by Dr Ara Monadjem and Mr Rod de Vletter, were appointed to draft the report, with the following methods used to gather the information:

- A review of relevant legislation, strategies, reports and other documents;
- Information gathering by way of semi-structured interviews with key government and non-government stakeholders and informants;

Key documents used as sources during the preparation of the report were:

National Biodiversity Strategy and Action Plan (NBSAP)

Swaziland's Third National Report to the CBD

Swaziland's National Capacity Self Assessment thematic profiles for the UNCBD, UNCCD and UNFCCC

Annex 2 - Further Sources of Information

Information	Organisation	Website address
General information	Swaziland Environment Authority	http://www.sea.gov.sz
	Swaziland National Trust Commission	http://www.sntc.org.sz
National government departments	Department of Water Affairs (MNRE)	wrb-wcon@realnet.co.sz
	Land Use Planning Section (MOA)	mngomezulud@gov.sz
	Department of Forestry (MTEA)	gamedzeso@gov.sz
Protected areas	Swaziland National Trust Commission	http://www.sntc.org.sz
	Big Game Parks	http://www.biggameparks.co.sz
Bioregional programmes	Trans-frontier Conservation Area Focal Point	http://www.sntc.org.sz
	Critical Ecosystem Partnership Fund	http:// www.cepf.net
Business and biodiversity	Big Game Parks	http://www.biggameparks.co.sz
	Mbuluzi Nature Reserve	mbuluzi@swazi.net
	Phophonyane Nature Reserve	rod@swazi.net
	Hawane Resort	http://www.hawane.co.sz/
	Shewula Nature Reserve	shewula@realnet.co.sz

Annex 3 - Progress towards Global Strategy for Plant Conservation (GCPC)

Swaziland does not have a national focal point for the GSPC, nor a national strategy for plant conservation. However, it recognises that the global strategy is a useful tool to determine priority plant conservation projects and to provide context and direction for projects already being undertaken. SNTC has staff working on eleven of the sixteen GSPC targets and is willing to co-ordinate the development of a national strategy.

While Swaziland recognises the need for a national strategy for plant conservation, it feels that targets should be set at appropriate levels for its floral diversity. Many of the targets in the GSPC need to be lowered for them to be implementable in Swaziland. This is due to the high numbers of globally threatened plant species in Swaziland.

Financial support programmes are important for assisting developing countries to achieve the targets of the GSPC. Support from developing countries has not been forthcoming during this reporting period.

Swaziland has good relationships with plant conservation practitioners in its neighbouring countries that have been developed through the Southern African Botanical Diversity Network (SABONET) programme, although these relationships need to be maintained and strengthened on a regular basis. In addition, through the existing network of volunteer scientists, Swaziland continues to work with neighbouring counterparts to develop national strategies for implementation of the GSPC.

Swaziland's limited progress in achieving some of the GSPC targets is largely due to it not having a national focal point, financial resources and a national strategy; nevertheless existing programmes and projects, particularly through the bioregional programmes discussed in section 3.3.2 of the main report, have contributed towards the conservation of plants in the country. It is acknowledged that greater resources will have to be invested in co-ordinating plant conservation efforts and broader involvement is required in implementing the GSPC to conserve Swaziland's rich plant diversity.

In addition, realistic targets need to be set at a national level and mechanisms for monitoring, reporting and evaluating progress will have to be put in place. An immediate priority to achieving the GSPC is for SNTC to be nominated as a focal point so that the institution can lead the development of a national strategy for plant conservation in which the global targets are revised.

Annex 4 - Progress towards Programme of Work on Protected Areas

Introduction

Swaziland has an established network of terrestrial protected areas. The Swaziland National Trust Commission Act of 1973 is the key legislative instrument that provides for the protection and conservation of ecologically viable areas representative of Swaziland's biodiversity and its natural landscapes through the Commission which is charged with the general supervision and control of the Swaziland National Centre and other declared institutions, national parks, nature reserves, monuments, relics and antiques. The SNTC Act is the current instrument used for establishing protected areas but has yet to be informed by recent initiatives in protected area management and IUCN categories. The Government is in the process of reviewing legislation with the view to update it into a comprehensive biodiversity management act. Management authorities for protected areas are mainly contracted organisations, private and in-house management by the SNTC.

Nature Reserves and Game Parks

A total of seven existing reserves, covering 64,100 ha (3.7 % of the country), have been proclaimed in Swaziland. Four are managed by the Swaziland National Trust Commission (Malolotja, Hawane, Mlawula (including Ndzindza) and Mantenga Nature Reserves), and three by Big Game Parks (Mlilwane Game Reserve, Hlane National Park, Mkhaya Game Reserve). These protected areas are distributed widely, but with a bias towards the north-eastern parts of the country (Figure 7).

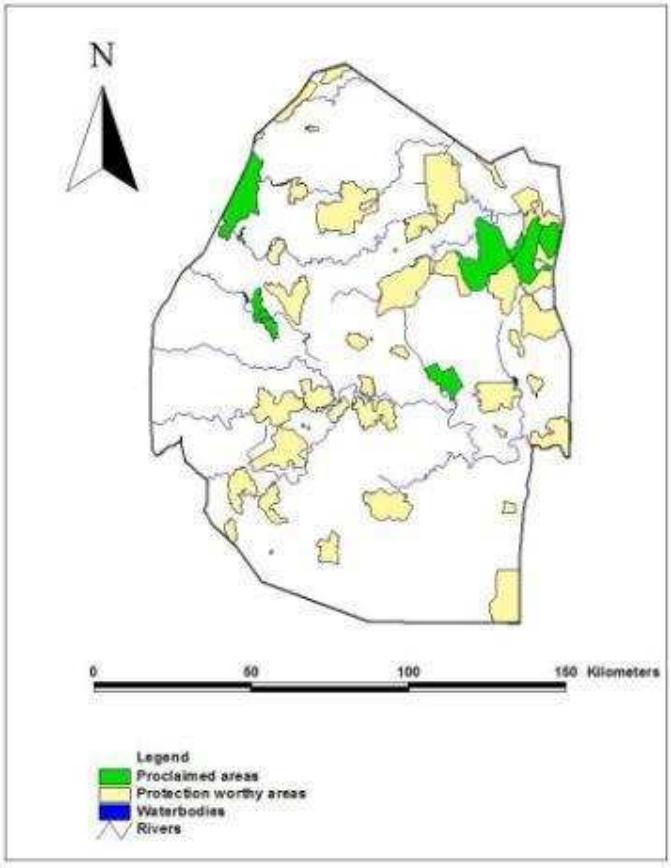

Figure 13. Map showing proclaimed (green) and protection worthy (beige) areas (adapted from Roques 2002)

An examination of Figure 7 reveals a clear absence of protected areas in the southern half of the country. There is no ecological reason for this. In fact, several habitat types occur in the south-west of Swaziland that are not found elsewhere in the country.

With just 3.7% of the country under protection (representing the northern regions only), Swaziland clearly needs more proclaimed parks and reserves. Proclamation of some or all the protection worthy areas identified during the field survey in 2002 would go a long way to addressing this issue.

An indication of how effective conservation areas really are is the proportion of threatened species occurring within them. This information is available for trees and vertebrates. As shown in Figure 8, only 50% of red data listed tree species are found in protected areas, compared with almost 80% of threatened mammals. This either suggests that the location of protected areas is biased towards mammals, or that mammals are disproportionately threatened. The reality is that it is probably a combination of both these factors.

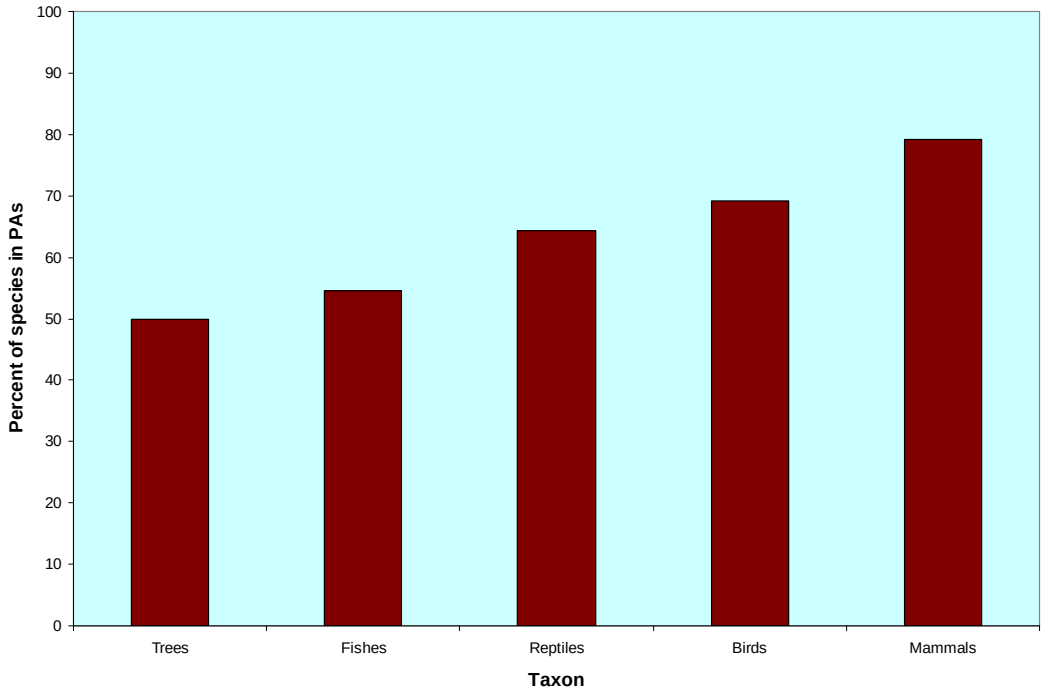

Figure 14: Percent of Red Data Listed species occurring in protected areas in Swaziland

Data sourced from Loffler & Loffter (2005) and Monadjem et al. (2003)

National Status

As can be seen from the results presented above, the global targets of conserving 10% of ecosystems and areas of importance for biodiversity within the country (Goal 1) have not been met.

Article 8 of the CBD calls for *in situ* conservation with emphasis on developing an adequate protected area network. As can be seen from the figures presented above, Swaziland does not have an adequate reserve network. For a start, the 10% target has not been met for any ecosystem. In fact, several habitat types are not represented in protected areas at all. Furthermore, many threatened species (and even more non-threatened species) currently survive beyond the boundaries of protected areas. This is a critical issue that needs to be addressed urgently by Swaziland.

Swaziland is participating in the regional Transfrontier Conservation and Resource Area programme and is working with neighbouring countries to declare and oeprationalise four trans-frontier parks – the Lubombo Conservancy-Goba TFCA, the Lubombo Nsubane-Pongola TFCA, Usuthu-Tembe-Futi TFCA and the Songimvelo-Malolotja TFCA.

TFCA's offer opportunities for community involvement and private sector participation which is critical in the design and implementation of TFCA initiatives. The active involvement of the different tourism authorities from the three countries in the initiative successfully complements their implementation. The cross border collaboration presents an opportunity for the country to tap into tourism flows to and from South Africa and Mozambique, e.g. the upcoming 2010 world Cup.

Article 8 also calls for the control of alien invasive species. Currently information on the assessment of the risks posed to ecosystems, habitats or species by the introduction of alien species has been carried out by the Ministry of Agriculture in close collaboration with the private industrial timber growers in the country. These industrial plantations closely monitor and track invasives within their plantations mainly to comply with Forest Stewardship Council requirements. Specific invasive floral species have been identified in several ecosystems that are having detrimental impacts on the environment. In November 2005 the Prime Minister declared *Chromolaena odorata* a national disaster as it is having a major impact on degrading agricultural land and protected areas – no control or management measures have yet been announced.

Goal	Progress	Challenges	Priorities
Goal 1.1: To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals			
CBD Target: By 2010, terrestrially and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a contribution to: • the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; • the Millennium Development Goals – particularly goal 7 on ensuring environmental sustainability; and • the Global Strategy for Plant Conservation			
	Limited progress to report		
Goal 1.2: To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function			
CBD Target: By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity and the concept, where appropriate, of ecological networks			
	Limited progress to report		
Goal 1.3: To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries			
CBD Target: • Establish and strengthen by 2010/2012 transboundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international co-operation • All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement			
	Three TFCAs established with neighbouring countries Regional co-operation through SADC protocols on Wildlife, Water and Forests Party to several agreements relating to shared water resources	Security issues regarding movement of tourists across international boundaries Resources and capacity to implement TFCAs	Implementation of TFCAs to generate biodiversity and socio-economic benefits
Goal 1.4: To substantially improve site-based protected area planning and management			
CBD Target: All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and			

Goal	Progress	Challenges	Priorities
monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement			
	Limited progress to report	Resources and capacity to implement the management plans	Develop management plans for protected areas Secure resources and capacity for effective management of protected areas
Goal 1.5: To prevent and mitigate the negative impacts of key threats to protected areas			
CBD Target: By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place			
	Limited progress to report	Alien invasive species strategy outstanding Activities outside of protected areas potentially have negative impacts within the protected areas, especially in river systems Co-ordinating standard response to threats across the country Resources and capacity to deal with threats	Finalise Alien Invasive Species Strategy Implement protected area management plans, including securing resources for implementation
Goal 2.1: To promote equity and benefit-sharing			
CBD Target: Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas			
	Limited progress to report	Resources and capacity to implement co-management and benefit sharing arrangements in protected areas	Develop models for co-management and benefit sharing between the state and communities Develop regulations on Bio-prospecting, Access and Benefit Sharing
Goal 2.2: To enhance and secure involvement of indigenous and local communities and relevant stakeholders			
CBD Target: Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new, protected areas			
	Limited progress to report	Capacity within agencies and communities for effective co-management and participation	Undertake capacity building to secure involvement of indigenous and local communities and relevant stakeholders, including

Goal	Progress	Challenges	Priorities
			co-management Secure resources
Goal 3.1: To provide an enabling policy, institutional and socio-economic environment for protected areas			
CBD Target: By 2008 review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems			
	Conservation agencies focus on generating socio-economic benefits from protected areas through projects, education, awareness and research	Sustainability of protected areas beyond government subventions	Develop and implement measures to ensure adoption of available financial resources
Goal 3.2: To build capacity for the planning, establishment and management of protected areas			
CBD Target: By 2010, comprehensive capacity-building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards			
	Most conservation agencies provide ongoing training programmes to strengthen capacity of their staff	Limited pool of qualified and skilled people for conservation management Loss of institutional memory with experienced staff leaving conservation agencies	Develop and implement human capital development strategy
Goal 3.3: To develop, apply and transfer appropriate technologies for protected areas			
CBD Target: By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and co-operation			
	Limited progress to report		
Goal 3.4: To ensure financial sustainability of protected areas and national and regional systems of protected areas			
CBD Target: By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and countries with economies in transition and small island developing States			
	Limited progress to report Private sector management of some parks	Current funding generally considered insufficient for effective management of protected areas Government funding for biodiversity conservation and protected areas unlikely to increase significantly	Develop sustainable strategies for protected area funding

Goal	Progress	Challenges	Priorities
		in the future International funding for bioregional and ecosystem programmes and other priority interventions of a short-term nature	
Goal 3.5: To strengthen communication, education and public awareness			
CBD Target: By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased			
	Swaziland Environmental Education Programme involved in various environmental and outreach programmes Several NGOs involved in broad environmental education	Public generally not aware of import role that protected areas play in ecosystems – mainly seen as tourist attraction Legislators also unaware of the importance of protected areas	Expand environmental education and awareness raising initiatives
Goal 4.1: To develop and adopt minimum standards and best practices for national and regional protected area systems			
CBD Target: By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted			
	Limited progress to report	No minimum standards and best practices for national and regional protected area systems	Develop minimum standards and best practices for national and regional protected area systems
Goal 4.2: To evaluate and improve the effectiveness of protected areas management			
CBD Target: By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties			
	Limited progress to report	No systems in place to measure effectiveness of management of protected areas	Establish protected area management effectiveness framework
Goal 4.3: To assess and monitor protected area status and trends			
CBD Target: By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets			
	Limited progress to report	No systems developed to enable effective monitoring of protected-area	Develop systems for effective monitoring of protected-area coverage, status and

Goal	Progress	Challenges	Priorities
		coverage, status and trends at national, regional and global scales	trends at national, regional and global scales
Goal 4.4: To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems			
CBD Target: Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management			
	Limited progress to report	Limited inter-disciplinary research i.e. integrating social and biodiversity Limited resources for research programmes Ensuring that there is a pool of emerging scientists	Protected area research priorities to be included in national research strategy