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Republic of South Africa Biodiversity and Tropical Forests Assessment

Submitted in accordance with Foreign Assistance Act
Sections 118/119



July 2012

Cover photo by Willie Boonzaaier, Pilanesberg National Park, North West Province. The springbok is the national symbol of South Africa. All other photographs in this report by Bryan Donner.

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Republic of South Africa

Biodiversity and Tropical Forests

Assessment

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LIST OF ACRONYMS AND ABBREVIATIONS

ANC	African National Congress
AU	African Union
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna & Flora
CMS	Convention on the Conservation of Migratory Species of Wild Animals
DBSA	Development Bank of Southern Africa
FAA	Foreign Assistance Act
FANRPAN	Food, Agriculture and Natural Resources Policy Analysis Network
GEF	Global Environment Facility
GDP	Gross Domestic Product
GIZ	German Agency for International Cooperation
GNI	Gross National Income
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
JEI	Judicial Education Institute
LDO	Land Development Objectives
LEDS	Low Emissions Development Strategy
LHWP	Lesotho Highlands Water Project
MAB	Man and the Biosphere Program
MEC	Member of the Executive Council of the Department of Environmental Affairs
NBSAP	National Biodiversity Strategy and Action Plan
NEPAD	New Partnership for Africa's Development
NEMA	National Environmental Management Act of 1998
NEMBA	National Environmental Management: Biodiversity Act of 2004
NGOs	Non-governmental Organization(s)
OECD	Organization for Economic Cooperation and Development
RSA	Republic of South Africa
SAG	South African Government

SANParks	South African National Parks
SANBI	South African National Biodiversity Institute
SADC	Southern Africa Development Community
TLMP	Textbook and Learning Material Program
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
US/USA	United States/United States of America
USAID	US Agency for International Development
USFS	United States Forest Service
USG	US Government (Agencies)
WESSA	Wildlife and Environment Society of South Africa
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

This Biodiversity and Tropical Forests Assessment for the Republic of South Africa is prepared for the U.S. Agency for International Development in Southern Africa in response to the Foreign Assistance Act Sections 118 and 119. It is designed to advise USAID in its regional strategic planning efforts. This report primarily assesses the status, threats, and recommendations for conserving biodiversity. As classically defined tropical forests are rare in South Africa, the report addresses the status of the indigenous, primarily temperate forests in the country.

South Africa's 118/119 assessment was conducted by a three-person team made up of a USDA Forest Service biological scientist and two local South African environmental consultants. The team conducted interviews and gathered information between mid-January and early February 2012, primarily in the Pretoria and Cape Town areas. The team concluded their visit by debriefing USAID in Pretoria on February 3, 2012. Preparation of the final report took place in February and March of 2012. The report follows the guidance provided by USAID lessons learned and best practices documents for 118/119 assessments.

Figure 1. Cape Town and Table Mountain National Park from Robben Island.



South Africa is one of the most biologically diverse countries in the world. For the size of the country, it contains an extraordinary number of ecological zones, is host to rare and endangered species, and exhibits high rates of endemism. Unique areas of biodiversity significance in South Africa include the “hotspots” of the Cape Floristic Region in the southwest, the Succulent Karoo in the west, and Maputaland-Pondoland-Albany in the southeast. These natural systems contain unique vegetation communities such as the famous fynbos in the Cape area. The biodiversity of the country is facing threats from many different aspects. Endangered species found in South Africa include, amongst many others, the black rhinoceros, riverine rabbit, African wild dog, leatherback turtle, several species of cycads, and a diverse array of migratory bird species.

South Africa is party to several international conventions important for the conservation of the region's biodiversity and indigenous forests. South Africa is a signatory to the Convention on Biological Diversity and has developed national strategies and action plans to conserve biodiversity. Further, the country is engaged with regional-level agreements to address important environmental issues, including the Southern Africa Development Community, the New Partnership for Africa's Development, and several trans-boundary conservation and water agreements. South Africa has constructed an impressive suite of natural resource legislation, beginning with the Constitution's guarantees for protecting the environment. Major laws that protect biodiversity include the National Biodiversity Act, the National Environmental Management Act, and the National Protected Areas Act. The South African Government is made up of many different departments and agencies tasked with implementing this legislation. Despite these policy and legal efforts, South African land management agencies face enormous challenges in addressing threats to biodiversity and ensuring the long-term viability of the country's natural resources.

A robust set of non-government and bi- and multi-lateral donor organizations operates in South Africa to assist with environmental efforts and biodiversity conservation. Several important non-government organizations (NGO), such as the Wildlife and Environment Society of South Africa, only operate within South Africa. Other NGOs, such as the World Wildlife Fund and the African Wildlife Foundation, are international organizations with local South African offices. In addition to USAID, donor organizations either provide direct assistance or provide long-term loans. Important donor organizations include the World Bank and the Global Environmental Facility.

In Southern Africa, USAID seeks to increase trade and strengthen economic ties within the region, address the HIV/AIDS crisis, mitigate recurrent food insecurity, and strengthen democracy to reduce the risk of conflict in the region. USAID environmental programs in South Africa, and biodiversity programs in particular, have not been funded to a substantial degree in the past due to this country's relatively advanced environmental legislation and regionally high standard of living. Current and past USAID environmental programs in South Africa have included helping to establish the Trans-Kalahari Corridor Management Committee with Botswana and Namibia, providing learning materials for elementary education that includes a natural science component, promoting low emissions strategies for reducing greenhouse gasses, and addressing trans-boundary water management.

The natural resources of South Africa are well characterized by its seven primary biomes. Most of the country supports the grasslands, savanna, or Nama Karoo biomes in nearly equal amounts of land area. The remainder of the country supports the forest, fynbos, thicket, or succulent Karoo biomes.

South Africa has a well-developed network of formally and informally protected areas. Areas protected under international protocols include world heritage sites, Ramsar wetlands sites, biosphere reserves, and peace parks. South African legislation has established national parks, special nature reserves, protected environments, and marine protected areas. Stewardship and conservancy programs have been established on private property with the help of NGOs to create areas with varying levels of protection. The amount of land area under some form of protected status is increasing, particularly biosphere reserves.

Compared to other southern Africa countries, South Africa has a high number of threatened plant and animal species. A high number of such species is indicative of the high amount of diversity found in a particular area. The vast majority of these species are exhibiting a deteriorating population level, with only a small number showing an improving or stable trend. Protection of endangered species is primarily accomplished through management of protected areas.

Indigenous forests that are high growing and dense are mainly found in the southern and eastern parts of South Africa and along the eastern escarpment. They normally occur in areas of high rainfall, high humidity, and on sheltered mountain sides. Forests cover less than 1% of the country's total land area and occur in highly fragmented and isolated areas. Most of the natural, indigenous forests are formally protected.

The major direct threats to biodiversity and natural resources in South Africa may be broadly categorized as the following: invasive alien organisms, current and historic mining activity, global climate change, inadequate environmental law enforcement, and improper disposal of medical waste.

- ***Invasive alien organisms.*** Invasive plant species displacing native vegetation is a major threat to biodiversity. The fynbos vegetation types in the Western Cape area are particularly vulnerable to displacement. If left unchecked, there would be a drastic reduction in the biodiversity and a large change in the amount of ecosystem services available. Being able to pinpoint the locality of high pressure areas is important when prioritizing projects. [“Citizen Science”](#) and school programs that train and use local community members to conduct monitoring and inventory occurrence are helpful to find species' distribution and also educates participants regarding environmental issues. Alien

terrestrial land animals have not been a substantial invasive species issue, but marine species along the coast could be affected by crustaceans that arrive on ships.

- ***Current and historic mining activity.*** This is a rapidly increasing concern for biodiversity conservation, particularly in the grasslands biome. The expansion of coal mining activity has been huge due to the need for meeting the expanding domestic demand for electricity and increasing exports. Groundwater contamination is occurring from toxic materials leaching from old mines, particularly in the Johannesburg area. Runoff from old mine waste is also contaminating agriculture and natural or protected areas.
- ***Climate change.*** Although uncertainties still exist with the projected impact of global climate change in South Africa, it will likely exacerbate the other threats in this list and have substantial direct impact on biodiversity and livelihoods. Climate change scenarios suggest South Africa will experience increases in temperature by 2 to 3 degrees Celsius by 2030 to 2050. Precipitation models indicate more precipitation will occur in the eastern and southern parts of the country and less precipitation would occur in the west. Increases in CO₂ could cause an increase in shrub and low tree cover; displacing the productive open grassland and Karoo biomes to bushlands/savanna/tree cover. The impacts of global climate change on biodiversity in South Africa may potentially be severe as the drier biomes may be subjected to increasing aridity and expansion of desert areas, changes in the range and composition of species, and a loss of rare alpine habitats.
- ***Inadequate environmental law enforcement.*** There is an impressive amount of well-constructed

Figure 2. Elephant in Pilanesberg National Park.



environmental legislation in South Africa, but adequate enforcement of these regulations is a threat to biodiversity. The judicial system has been unable to consistently prosecute environmental crimes. Regulatory framework exists to stop or limit offenses, such as poaching threatened species, but the political will in a country with high levels of unemployment is often missing. The enforcement of industrial, domestic, and agricultural pollution regulations has also been lacking. Over-exploitation of medicinal plants and marine organisms has recently become a major concern as law enforcement has not been able to adequately apprehend and prosecute this criminal behavior.

The corruption of local law enforcement and political figures is recognized as contributing to this issue.

- ***Medical waste.*** The improper disposal of medical waste has recently been identified as a major threat to biodiversity. As donor organizations such as USAID increase their involvement with health programs, primarily related to HIV/AIDS, the amount of medical waste generated has increased. Much of the material is highly toxic and is simply being disposed of in landfills or as litter. Safe water supplies could be compromised, affecting both domestic use and freshwater and marine aquatic diversity.

These threats may be driven or exacerbated by a set of minor or emerging threats. Specifically, these less substantial threats include: agriculture and commercial plantation forestry, urban development, fuelwood use, poor governance, too much emphasis on [“charismatic megafauna.”](#) non-petroleum based energy development, biodiversity information management, and the profile of environmental issues.

Although several current and future USAID activities may address threats to biodiversity, exceptional opportunities exist to integrate and create synergies among USAID objectives and conservation or environmental goals. The following six recommendations are currently tangentially related to USAID programs and objectives; however, the assessment team has identified these specific themes as high priorities for USAID to consider in its new strategy for development assistance in South Africa. Each of these recommendations provides opportunities for USAID to engage United States Government (USG) technical agencies in support of the “whole of government” approach.

- ***Build capacity for an environmental program to reduce the spread of invasive alien organisms.*** Invasive alien organisms could be the most substantial threat to conserving biodiversity in South Africa. An effective effort at controlling alien species has been the South African Government’s Expanded Public Works programs, notably: Working for Energy, Working on Fire, Working for Wetlands, and Working for Water. These programs have offered concrete results in reducing the incidence of invasive species while providing employment for underprivileged people. USAID is recommended to assist the South African Government with their Expanded Public Works programs.
- ***Build capacity for better governance.*** In order to address inadequate law enforcement and government corruption regarding environmental issues, the capacity for better governance needs to be improved. The environmental awareness skill set of the government’s environmental officials and managers needs to be greatly increased, especially at the provincial government and local municipal levels. The traditional tribal structures at the local levels have jurisdiction over allocation of land use rights to its affiliated tribal members; mostly with no regard to ecological capacity of the land. The tribal infrastructure and capacity for implementing projects is not well developed in most communities. USAID is recommended to develop an educational training program for locally elected officials or tribal chiefs to improve understanding of environmental issues and biodiversity conservation. Also, it is recommended to initiate a governance project to investigate how to strengthen capacities within the local and tribal land allocation authorities.
- ***Environmental education at the elementary school level.*** Education early at the elementary level is critical for creating life-long awareness of environmental issues. The education programs need to improve the quality of the teachers and include environmental education in the curriculum. USAID is recommended to develop and provide an environmental education curriculum that emphasizes the importance of biodiversity and the impacts that invasive alien organisms are having. Improving awareness at a young age could result in a lifetime of conservation. Children often influence the behavior of parents as well. The “Eco-Schools” initiative currently being implemented by WESSA is a successful program that could be enhanced.
- ***Improve biodiversity conservation practices within the human health programs.*** Improved living conditions from a healthier environment can result in better human health. Better living conditions can be achieved through disaster mitigation, alternative livelihoods, flood mitigation, and improved water quality; in turn resulting in increased biodiversity conservation as less pressure is placed on the flora and fauna for survival. USAID is recommended to improve medical waste disposal education and practices. USAID is further recommended to improve water quality and disaster mitigation programs.
- ***Build capacity for South Africa to mitigate impacts of global climate change.*** Mitigating the effects of climate change can be achieved by reducing South Africa’s contribution to global carbon emissions. USAID is recommended to implement a well-designed clean cooking stove initiative to

reduce fuel wood use, improve indoor air quality/health issues, and reduce greenhouse gasses; expand the Low Emissions Development Strategies (LEDS) program; and encourage the use of renewable energy sources such as wind and solar to reduce the reliance on coal.

- ***Assist South Africa in the development of national and provincial-level action plans for adaptation to global climate change.*** Adapting to a changing climate can be achieved by decreasing the vulnerability of South Africa to the impacts of global climate change. USAID is recommended to encourage collaboration among NGOs and government agencies on climate change adaptation to share information and reduce redundancy and contradiction; assist NGOs and government agencies with spatial data management approaches; and assist the South African National Biodiversity Institute with their efforts at establishing a regional plant seed bank.

South Africa faces many serious challenges to efforts for the conservation of its biodiversity. With its unique natural systems, iconic wildlife, and high rates of endemism, sustained efforts to conserve biodiversity and sustainably manage natural resources are critical. Exceptional opportunities exist for USAID to incorporate activities and programs to address threats to biodiversity and promote long-term viability of the region's unique species and natural resources. The sustained health of natural resources and biodiversity in the region is vital for meeting major USAID goals and objectives related to economic growth, democracy and governance, education, and health.

I. INTRODUCTION

A. Background of the Republic of South Africa

South Africa is one of the most culturally as well as biologically diverse countries in the world. Cultural diversity is a key feature of South Africa, where eleven languages are recognized as official and a large variety of ethnic groups are represented in the “Rainbow Nation.” Biological diversity is also key. Over 20,000 different species of plants have been identified in South Africa and the diversity of animal life is a major economic factor for the tourism industry that relies on the great range of African mammals found within its borders.

South Africa is a young democracy. The sociopolitical structure of the country is still evolving. The conservation of the unique environmental attributes within South Africa have yet to be assured, as evidenced by land use allocation struggles, illegal trade of endangered species, and other pressures to improve economic conditions. The resolution of these past and emerging problems requires not only the efforts of the South African government, but also the engagement and participation of the wider regional and global community.

Figure 3. Map of South Africa



South Africa is a land of great contrasts in topography and climate. The interior of South Africa is a vast, flat, and sparsely populated grass and shrubland. In contrast, the eastern coastline is lush and well-watered, which produces a climate similar to the tropics. These diverse natural conditions have resulted in a highly diverse plant and animal ecosystem.

A1. Physical Background

South Africa is located at the southern tip of Africa, bordered by the Indian Ocean on the south and east coasts and the Atlantic Ocean on the west coast. The countries of Namibia, Botswana, and Zimbabwe form the northern border with Mozambique and Swaziland to the east. The small country of Lesotho is an enclave surrounded entirely by South Africa. The total area of South Africa is approximately 1.2 million square kilometers, making it the 25th largest in the world. Like much of the African continent, South Africa's landscape is dominated by a high plateau in the interior, surrounded by a narrow strip of coastal lowlands. Unlike most of Africa, however, the perimeter of South Africa's inland plateau rises abruptly to form a series of mountain ranges before dropping to sea level. These mountains, known as the Great Escarpment, vary between 2000 meters and 3300 meters in elevation. The coastline is fairly regular and has few natural harbors.

South Africa has a generally temperate climate, due in part to being surrounded by the Atlantic and Indian Oceans on three sides, by its location in the climatically milder southern hemisphere, and due to the average elevation rising steadily towards the north (towards the equator) and further inland. Due to this varied topography and oceanic influence, a great assortment of climatic zones exist. The climatic zones range from the extreme desert of the southern Namib in the farthest northwest to the lush subtropical climate in the east along the Mozambique border and the Indian Ocean. From the east, the land quickly rises over a mountainous escarpment towards the interior plateau known as the Highveld. The extreme southwest has a climate remarkably similar to that of the Mediterranean with wet winters and hot, dry summers. This region is also particularly known for its wind, which blows intermittently almost all year. Further east on the south coast, rainfall is distributed more evenly throughout the year, producing a green landscape.

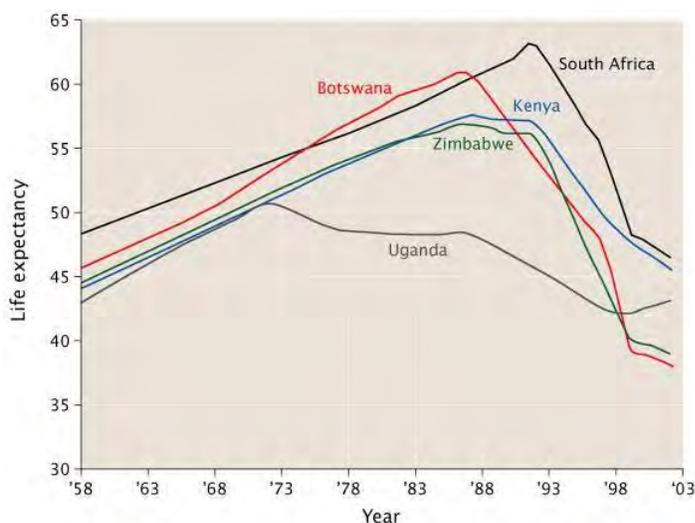
A2. Population

South Africa is multi-ethnic and has diverse cultures and languages. Eleven official languages are recognized in the constitution. Two of these languages are of European origin: South African English and Afrikaans, a language which originated mainly from Dutch that is spoken by the majority of white and Coloured South Africans. Though English is commonly used in public and commercial life, it is only the fifth most spoken official language. All ethnic and language groups have political representation in the

country's constitutional democracy comprising a parliamentary republic.

About 80% of the South African population is of black African ancestry, divided among a variety of ethnic groups speaking different Bantu languages, nine of which have official status. South Africa also contains the largest communities of European, Asian, and racially mixed ancestry in Africa.

Figure 4 – Life Expectancy in Select Southern Africa Countries



More people are living with HIV/AIDS in South Africa than any other country in the world. A 2009 estimate is that the prevalence rate for HIV/AIDS infection is 18% of South Africans.¹ The disease has had a devastating effect on the life expectancy of the people and the productivity of the economy (see adjacent figure). Many victims were the primary wage earners in their family and many “AIDS orphans” have resulted; who in many cases are dependent on the Government of South Africa for care and financial support.

Please see the following table for details of South African demographics. Demographic estimates for South Africa explicitly take into account the effects of excess mortality due to HIV/AIDS; this can result in lower life expectancy, higher infant mortality, higher death rates, lower population growth rates, and changes in the distribution of population by age and sex than would otherwise be expected.

Table 1. Demographics for South Africa, with world ranking in parentheses (ranking from greatest to least).

Area (M sq. km)	Population (millions)	Life Expectancy in Years	% 0-14 Years Old	Population Growth Rate, %	% Below Poverty Line	Literacy Rate
1219.1	48.8	49.3	28.5	-0.4	50	86.4
(25)	(26)	(215)	(97)	(219)	(26)	(125)

Source: CIA World Factbook. Found at: https://www.cia.gov/library/publications/the-world-factbook/region/region_cas.html

A3. Economy

The economy of South Africa is the largest on the continent. South Africa has a mixed economy with a high rate of poverty and a low Gross Domestic Product (GDP) per capita. Unemployment is high and South Africa is ranked in the top 10 countries in the world for income inequality, measured by the [Gini coefficient](#). During 1995 to 2003, the number of formal jobs decreased and informal jobs increased with the overall unemployment rate worsening (SARPN 2008). In 2000, the average white household was earning six times more than the average black household. Official affirmative action policies have resulted in a rise in black economic wealth and an emerging black middle class (OECD 2008).

A 2011 [study](#) published by the University of Cape Town about the richest 10% of South Africans found that nearly 40% are black, where this group had once been almost exclusively white. While only 29% of the absolute wealthiest South Africans are black, this jumps to 50% among the "entry level" rich (defined as earning more than \$4000 per year). Factors that were found to be common among those in the entry-level rich group include being young, entrepreneurial, and having some post-secondary education.

Unlike most of the world's poor countries, South Africa does not have a thriving informal economy; according to the Organization for Economic Cooperation and Development ([OECD](#)) estimates, only 15% of South African jobs are in the shadow economy, compared with around half in Brazil and India and nearly three-quarters in Indonesia. The OECD attributes this difference to South Africa's widespread welfare system.

After 1994, government policy brought down inflation, stabilized public finances, and some foreign capital was attracted, however growth was still subpar. From 2004 onward, economic growth picked up significantly; both employment and capital formation increased. Many immigrants to South Africa continue to live in poor conditions, and the immigration policy has become increasingly restrictive since

¹ CIA World Factbook. Found at: https://www.cia.gov/library/publications/the-world-factbook/region/region_cas.html

1994. Principal international trading partners of South Africa, besides other African countries, include Germany, the United States, China, Japan, the United Kingdom, and Spain.²

For years, the South African economy has enjoyed sustained growth. However, the global economic crisis in 2009 has caused this growth to falter. More than a million jobs have been lost. The people worst affected are those with little education and no training – almost half the population. These people have had little chance in the formal labor market. At the same time, the lack of a well-qualified workforce is the main factor limiting the continued development of the economy.

Mining has been the main driving force behind the history and development of Africa's most advanced and richest economy. Diamond and gold production may now be well down from their peaks, though South Africa is still the second largest producer of gold in the world. Mining now accounts for a mere 2% of employment and 3% of GDP, down from around 14% in the 1980s. South Africa is a popular tourist destination, and a substantial amount of revenue comes from tourism. South Africa has a broad and well-developed agricultural sector and is a net food exporter in most years. Manufacturing is relatively small, providing just 13% of jobs and 15% of GDP. Labor costs are low, but not nearly as low as in most other emerging markets, and the cost of transport, communications, and general living is much higher than other emerging countries.

A4. Politics

South Africa is a parliamentary republic, although unlike most such republics the President is both head of state and head of government, and depends for his tenure on the confidence of Parliament. The executive, legislature, and judiciary are all subject to the supremacy of the Constitution, and the superior courts have the power to strike down executive actions and acts of Parliament if they are unconstitutional. South Africa has three capital cities: Cape Town is the legislative capital, Pretoria is the administrative capital, and Bloemfontein is the judicial capital.

At the end of apartheid in 1994, the "independent" and "semi-independent" Bantustan Homelands were abolished and nine new provinces were created. Each province is governed by a unicameral legislature, which is elected every five years by party-list proportional representation. The legislature elects a Premier as head of government, and the Premier appoints an Executive Council as a provincial cabinet. The powers of provincial governments are limited to topics listed in the Constitution; these topics include such fields as health, education, public housing, and transport.

Since 1994, South African politics have been dominated by the African National Congress (ANC), which has been the most popular political party with 60 to 70% of the vote. The main challenger to the rule of the ANC is the Democratic Alliance. The National Party, which ruled from 1948 to 1994, renamed itself in 1997 to the New National Party, and chose to merge with the ANC in 2005.

In 2008, South Africa placed 5th out of 48 sub-Saharan African countries on the Ibrahim Index of African Governance. South Africa scored well in the categories of Rule of Law, Transparency & Corruption, and Participation & Human Rights; but was let down by its relatively poor performance in Safety & Security. The Ibrahim Index is a comprehensive measure of African governance, based on a number of different variables which reflect the success with which governments deliver essential political goods to its citizens.³

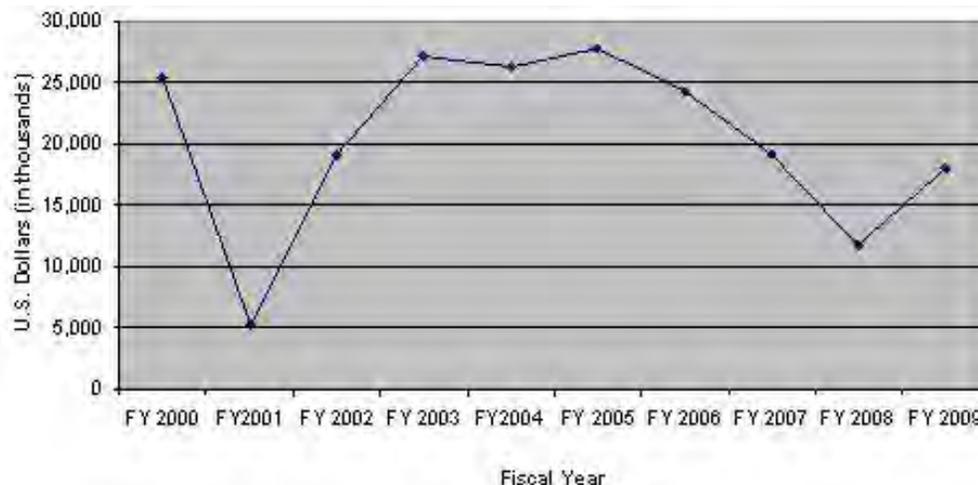
² <https://www.cia.gov/library/publications/the-world-factbook/geos/sf.html>

³ "Mo Ibrahim Foundation". Mo Ibrahim Foundation. <http://www.moibrahimfoundation.org/>. Retrieved 30 October 2011.

B. Background on USAID Activities

USAID's mission in South Africa is accomplished with bilateral programs that are specific to the Republic of South Africa and regional programs that are implemented across the 12 countries that make up USAID/Southern Africa.⁴ In Southern Africa, the United States seeks to increase trade and strengthen economic ties within the region, address the HIV/AIDS crisis, mitigate recurrent food insecurity, and strengthen democracy to reduce the risk of conflict in the region. USAID/Southern Africa, located in Pretoria, complements and enhances USAID's bilateral program in South Africa, supporting regional activities and providing a range of services. Figure 6 summarizes funding for all USAID programs in Southern Africa.

Figure 6. USAID's budget in Southern Africa during the period 2000-2009.⁵



As described in more detail later in this report, environmental legislation in South Africa is relatively advanced compared with other Sub-Saharan African countries. Consequently, USAID funding for environmental programs, and biodiversity programs in particular, has not been substantial. USAID biodiversity and natural resource management activities in South Africa in the last decade, along with some projected activities, include the following:

- Since 2001, USAID has provided technical assistance and training to establish the Trans-Kalahari Corridor Management Committee. In 2003, ministers of transport in Botswana, Namibia, and South Africa signed a memorandum of understanding that binds the governments and private sector, enabling an increase in regional trade.
- For over ten years, USAID's Criminal Justice Strengthening Program has supported the South African Government's (SAG) efforts to effectively deal with crime through three key areas: (1) strengthening justice sector institutions; (2) improving case processing and court efficiency; and (3) developing crime and violence prevention strategies with a particular focus on preventing violence against women and children. In Fiscal Years 2010 to 2012, USAID will fund the National Prosecuting Authority and the South African Judiciary to provide targeted technical assistance and institutional support for the newly established Judicial Education Institute (JEI). A strengthened

⁴ The countries that make up the USAID/Southern Africa mission include Angola, Botswana, Lesotho, Madagascar, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe.

⁵ Source: http://sa.usaid.gov/southern_africa/node/3

justice system allows for improved apprehension and prosecution of the criminal harvest and trade of threatened plant and animal species.

- USAID funded the recently completed Textbook and Learning Material Program (TLMP). This program provided primary school textbooks and learning materials for South Africa's Department of Education (DoE) through a collaborative partnership. The partners, together with a curriculum specialist at the DoE, created student workbooks and accompanying teacher guides in all 11 official South African languages in three areas: life orientation, mathematics, and natural science.
- The Enhancing Capacity for Low Emissions Development Strategy (LEDS) is a new USG program to support developing countries' efforts to pursue long-term, transformative development and accelerate sustainable, climate-resilient economic growth while slowing the growth of greenhouse gas emissions.⁶ The program will provide technical assistance in support of South Africa's efforts to accelerate climate-resilient growth while slowing the growth of greenhouse gas emissions. Technical focus areas are still under discussion and will be determined by the needs and interests of the SAG. Illustrative types of activities the USG can support include greenhouse gas inventory techniques; policy, regulatory, and institutional analyses; economic models; methods for data collection; and sector-specific analyses. The program will extend through at least 2012, with follow-on activities in the clean energy realm a possibility.
- USAID/South Africa is working with the Wildlife and Environment Society of South Africa (WESSA) through their SustainEd program for building capacity for a variety of stakeholders to increase their skills set for understanding environmental issues. One of the major focus areas of this educational program is climate change adaptation. The Sustainability Commons for Climate Awareness and Response program aims to implement a national network of sustainable technologies centers that offer training and experiential learning on climate-friendly technologies such as rainwater harvesting and solar energy.
- USAID/Southern Africa manages the centrally funded NanoPower Africa program. A result of the Africa-U.S. Higher Education Initiative, NanoPower Africa is helping the University of Cape Town to develop its NanoSciences Innovation Centre, which will form the hub of a growing research and innovation network in sub-Saharan Africa through research to develop low-cost, indigenously produced, photovoltaic devices from nano-materials.
- USAID/Southern Africa seeks to strengthen regional and local capacity in addressing trans-boundary water resource management, build consensus on resource allocation that supports sustainable development and protects biodiversity, and improve access to water supply and sanitation services. USAID/Southern Africa has and will continue to focus on improving the management of shared river basins within the Southern Africa Development Community (SADC), and has recently initiated the Resilience in the Limpopo River Basin Project in South Africa, Botswana, Mozambique, and Zimbabwe. This project will emphasize reducing the effects of nutrient pollution, particularly in the Olifants River subcatchment. A similar water quality project for the Orange River is being developed.
- In 2008, under a USAID contract, the National Oceanic and Atmospheric Administration and the U.S. Geological Survey developed the Environmental Information for Natural Resource Management program. This program aims to strengthen the capacity of regional organizations, community groups, NGOs, and government natural resource management authorities in Southern Africa by collecting and analyzing data and information about the region's natural resources. The focus of this activity is to

⁶ A factsheet can be found at:

http://www.usaid.gov/our_work/environment/climate/docs/ECLLED_factsheet_17oct2011.pdf

provide technical assistance to the SADC Regional Remote Sensing Unit to update the regional natural resource database and enhance ecological information dissemination.

- USAID continued support of the regional Food, Agriculture, and Natural Resources Policy Analysis Network (FANRPAN). USAID has been FANRPAN's lead donor since its inception in 2002. In FY 2009, FANRPAN formalized seven strategic partnerships to leverage \$1.9 million in USAID funding for regional agriculture and natural resource policy capacity building.

C. Current U.S. Government Programming

In addition to USAID, many other USG programs have a presence in South Africa. These programs primarily deal with the HIV/AIDS crisis, but also address poverty alleviation and economic diversification, trade expansion, regional security, and environmental protection. South Africa received over \$500 million in USG aid in 2011; the sixth most of any country. Current programs include the following:

- Through the President's Emergency Plan for AIDS Relief (PEPFAR), the U.S. Government provided over \$3.1 billion between FY 2004 and 2011 to combat HIV/AIDS in South Africa. Many government agencies contribute to PEPFAR, including the Department of Health and Human Services, the Department of State, the Department of Defense, USAID, and the Peace Corps. South Africa has also benefitted from grants from the Global Fund to Fight AIDS, Tuberculosis and Malaria, to which the U.S. is the largest single contributor.⁷
- Smaller sums of U.S. foreign assistance for 2011 in South Africa included \$100,000 allocated for foreign military financing and \$800,000 for peace and security, to assist in training South Africa's military leaders through the International Military Education and Training program.
- The U.S. Ambassador's Self-Help Program assists small, not-for-profit, community-run projects in South Africa. The goal of the Self-Help Program is to improve basic environmental, economic, social, and quality-of-life conditions in the communities. The program has supported the building of care centers for disabled and orphaned children, children's daycare centers, and preschools. Projects that have been funded in the past include sewing, brick making, other manufacturing and farming cooperatives, and community water and sanitation projects.
- Program sectors for the Peace Corps in South Africa include Education and Health & HIV/AIDS. Funding for the Peace Corps in South Africa for each of FY2011 and 2012 was approximately \$5.0 million. Peace Corps volunteers work with NGOs and SAG coordinators to reduce the incidence and impact of HIV/AIDS.
- The United States Department of Commerce has assisted South Africa's competitiveness in the global marketplace through the African Growth and Opportunity Act, a law that significantly enhances U.S. market access for (currently) 41 sub-Saharan African countries. The U.S. Government, through this law, contributed to the growth of imports from South Africa, notably minerals, metals, transportation equipment, machinery, and chemicals.

⁷ Source: <http://www.theglobalfund.org/en/>

D. Rationale for a Biodiversity and Tropical Forest Assessment in South Africa

This Biodiversity and Tropical Forests Assessment for the Republic of South Africa is prepared for the U.S. Agency for International Development, Regional Mission in Southern Africa, in response to the Foreign Assistance Act (FAA) Sections 118 and 119 and Automated Directives System 201 requirements on Environmental Analysis for Biodiversity and Tropical Forests conservation. The FAA mandates that U.S. foreign aid shall not be used in ways that damage the environment, either globally or locally, or that deplete the natural resources base necessary for sustainable development.

The document provides the Biodiversity and Tropical Forests Assessment for the Mission's next Strategic Plans. The Strategy period will be 2012 to 2017. Sections 118 and 119 dictates that every country strategic plan developed by USAID shall include: "The actions necessary in that country to conserve tropical forests and biological diversity and the extent to which the actions proposed for support by that Agency meet the needs thus identified." An update of the assessment will be necessary if the conditions to conserve biodiversity change significantly and/or if the actions by Missions are found to have a significant impact on the biodiversity and forests of South Africa.

This document builds on the biodiversity and tropical forests assessment conducted in 2005 (USAID/South Africa 2005) and has sought to update findings, threats, and recommendations that are relevant for the conservation of biodiversity and forests in South Africa.

Tropical forests are generally characterized by a climate with high temperature, humidity, and rainfall, and having light frosts very rarely and an average temperature of 65°F (18°C) for the coolest month. South Africa has very few forests that meet this definition. As the boundaries of South Africa are at least partially located within the tropics (the northeastern area of the Limpopo province is north of the Tropic of Capricorn), a section 118 assessment is required. However, due to the limited amount of tropical forest, this report will address the status of the indigenous forest types of South Africa.

D1. Methodology of Assessment

South Africa's 118/119 assessment was conducted by a three-person team made up of team leader Bryan Donner, a biological scientist from the USDA Forest Service's Flathead National Forest in Kalispell, Montana; Willie Boonzaaier, an environmental consultant from Rustenburg, South Africa; and Alistair Haig, an environmental consultant from White River, South Africa.

Prior to arrival in South Africa on January 15, 2012, Bryan consulted with USAID/Africa in Washington, D.C. regarding their expectations for the assessment. While in Washington, he also interviewed NGOs

Figure 7. Red Crassula Flower on Table Mountain.



who are currently conducting conservation activities in South Africa. Willie arranged for on-the-ground interviews and site visits with key stakeholders, including representatives of South African ministries, non-governmental organizations, and USAID and U.S. Embassy staff (see Appendices A and B). Alistair provided logistical support, primarily involving local transportation. The team was based out of the USAID Regional Mission Office in Pretoria with field visits conducted in and around Pretoria and Cape Town.

The team concluded their visit by debriefing USAID in Pretoria on February 3, 2012. Preparation of the final report took place in February and March of 2012.

The report follows the guidance provided by the documents [Tropical Forestry and Biodiversity \(FAA 118 and 119\) Analyses: Lessons Learned and Best Practices from Recent USAID Experience](#) (2005) and [Best Practices for Biodiversity and Tropical Forest Assessments](#) (2005).⁸

II. LEGISLATIVE AND INSTITUTIONAL STRUCTURES AFFECTING BIODIVERSITY AND FORESTS

A. Policies and Treaties Related to the Environment

International environmental law has developed rapidly over the past 30 years; a number of conventions have been completed, both multilateral and bilateral instruments, to address global and regional issues. Several international agreements are particularly important and relevant to biodiversity conservation, including⁹:

- Convention on Wetlands of International Importance (Ramsar Convention), 1971
- Convention on International Trade in Endangered Species (CITES), 1973
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention or CMS), 1979
- Convention on Biological Diversity (CBD), 1992
- Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 2000
- United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought (UNCCD), 1994
- Montreal Protocol on Substances That Deplete the Ozone Layer, 1987
- United Nations Framework Convention on Climate Change (UNFCCC), 1992
- Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1998
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1992
- Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (London Convention), 1972
- Convention on Fishing and Conservation of Living Resources of the High Seas, 1958
- Stockholm Convention on Persistent Organic Pollutants, 2001

South Africa is party to these key international agreements on biodiversity. Many of these agreements require action plans and reports, all of which South Africa has submitted.

The Republic of South Africa has also been engaged in the development of regional-level agreements, strategies, and action plans. Regional initiatives include the Southern Africa Development Community, the New Partnership for Africa's Development, and the Lesotho Highlands Water Project.

⁹ For more information on these international conventions, please visit the following web link:

<https://www.cia.gov/library/publications/the-world-factbook/appendix/appendix-c.html>

The ***Southern Africa Development Community (SADC)*** is a regional-level program among fifteen Southern African states.¹⁰ The program is designed to promote sustainable and equitable economic growth and socio-economic development through efficient productive systems, deeper co-operation and integration, good governance, and durable peace and security. Through consultative and participatory processes, the SADC Water Division guides the harmonization of national policies and the implementation of activities by all stakeholders, in a region where 70% of the water resources are shared across national boundaries. The shared nature of this resource means water development and management is not just a national task but a regional one as well.

The ***New Partnership for Africa's Development (NEPAD)*** is a program of the African Union (AU) adopted in Lusaka, Zambia in 2001. NEPAD is directed by African leaders to pursue new priorities and approaches to the political and socio-economic transformation of Africa. NEPAD's objective is to enhance Africa's growth, development, and participation in the global economy. One of their six theme areas includes climate change and natural resource management. This theme area plays a coordinating and advocacy role to promote regional and national programs aimed at counteracting these environmental threats in the environment, energy, and water sectors. NEPAD believes that addressing environmental issues is a pre-condition for its other goals of sustainable growth and development. The program aims to strengthen skills in adaptation, mitigation, technology, and finance to combat environmental change.

The ***Lesotho Highlands Water Project (LHWP)*** is a joint development project by South Africa and Lesotho to supply South Africa with water for industrial and domestic use and provide electricity and revenue for Lesotho. The project also promotes the general development of the remote and underdeveloped mountain regions of Lesotho, while ensuring that comprehensive measures are taken to counteract any adverse effects which the project might have on the local population and their environment. The treaty establishing the project was signed in 1986 and the first phase of the project, including dams and conversion tunnels, has been implemented. Subsequent phases involving new dams and tunnels are possible.

Finally, South Africa is party to numerous trans-boundary water agreements as both the Limpopo and Orange Rivers form borders with neighboring countries. The following table provides a brief list and description of the major trans-boundary water agreements.

Table 2. Summary of Major Trans-boundary water agreements in South Africa (Wirkus 2005).

Agreement	Year	Description
Permanent Water Commission. Agreement between South Africa and Namibia.	1992	The Commission advises the two governments on matters pertaining to the development of the perennial Lower Orange River where it forms the border between the two countries.
Joint Irrigation Authority. Agreement between South Africa and Namibia.	1992	Recognized the need to implement an irrigation scheme and improve water management on the Lower Orange River.
Orange-Senqu River Commission (ORASECOM). Agreement between South Africa, Lesotho, Namibia, and Botswana.	2000	Recognized the need for basin-wide management of the Orange River Watercourse System from the source to the ocean.

¹⁰ Including: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe.

Limpopo Basin Commission (LIMPCOM). Agreement between South Africa, Botswana, Zimbabwe, and Mozambique.	2003	Recognized the need for shared water management of the Limpopo River for both agricultural and domestic use.
Inkomati Maputo River Commission. Agreement between South Africa, Swaziland, and Mozambique.	2003	Established a mechanism through which sharing agreements and access to water is considered and agreed.

B. Legislation Related to the Environment

At the national-level, South Africa has developed extensive plans, strategies, and frameworks designed to promote the sustainable management of natural resources and conservation of biodiversity. However, South Africa ranks relatively low (128 out of 132 countries) in a 2012 Yale University assessment of environmental performance based on a weighting of carbon and sulphur emissions, water purity, and conservation practices.¹¹ Much of South Africa’s environmental legislation is modeled on a “[command and control](#)” approach, where the threat of punishment is designed to deter any aberrant behavior but also allows for corrupt officials to permit such behavior. An alternative approach to this model is to incentivize environmental compliance by providing financial rewards for cleaning up potential polluting activities. This alternative approach is finding favor in the activities of the South African NGO community and the South African government has adopted tax incentives for environmental performance, mainly in the form of mine rehabilitation deductions.

Some environmental legislation created prior to free and open elections being implemented in South Africa are still in force, but most have been enacted after 1995. The primary strategic goal is to build capacity in local government to effectively incorporate environmental considerations into integrated development plans and land development objectives. Environmental legislation in South Africa begins with Chapter 2 of the Constitution (the Bill of Rights), which states “*Everyone has the right to an environment that is not harmful to their health or well being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures.*”

A short description of major environmental legislation at the national level is provided below:

National Environmental Management Act

The National Environmental Management Act of 1998 (NEMA) is intended to provide a framework for integrating good environmental management into all development activities and to promote cooperative environmental governance with regard to decision-making by State agencies on matters affecting the environment.

NEMA provides for the compilation of environmental implementation plans and management plans by various departments. The purpose of these plans is to co-ordinate and harmonise the environmental policies, plans, programs, and decisions of the various national departments with that of provincial and local spheres of government, in order to:

- minimize the duplication of procedures and functions; and
- promote consistency in the exercise of functions that may affect the environment.

¹¹See: <http://epi.yale.edu/epi2012/rankings> for complete ranking and trend analysis.

National Biodiversity Act

The National Environmental Management: Biodiversity Act of 2004 (NEMBA) operates in conjunction with the National Environmental Management: Protected Areas Act of 2003. The objectives of the Act are, within the framework of the National Environmental Management Act, to provide for:

- the management and conservation of biological diversity within the Republic and of the components of such biological diversity;
- the use of indigenous biological resources in a sustainable manner; and
- the fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources.

National Protected Areas Act

The National Environmental Management: Protected Areas Act of 2003 is described in full later in this report under the *Status and Protection of Protected Areas* subsection of Section III, Status and Management of Natural Resources.

National Waste Act

The National Environmental Management: Waste Management Act of 2008 is the primary legislation dealing with waste disposal and treatment. The Waste Act aims to bring about a fundamental shift in the legal framework dealing with waste management in South Africa, with greater regulatory focus being afforded to all aspects of waste management throughout the waste cycle (as opposed to only focusing on waste disposal and treatment sites).

A short description of major environmental legislation at the local level is provided below:

Development Facilitation Act of 1995 (DFA)

The Development Facilitation Act of 1995 (DFA) requires municipalities to produce land development objectives (LDOs). The subject matter which must be included in the LDOs are those objectives relating to urban and rural growth in the relevant area, including objectives in relation to the sustained utilization of the environment, coordination of land development in consultation with other authorities, land use control, and the optimum utilization of natural resources. LDOs can thus be described as a policy framework of local government, guiding land development in a particular area of jurisdiction.

Municipal Systems Act of 2000

The purpose of this Act is to, among other things, provide for the core principles, mechanisms, and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities in harmony with their local natural environment. In order to achieve the purpose of the Act, each municipality in South Africa, within a prescribed period, needs to adopt an integrated development plan (IDP) which links, integrates, and coordinates plans and takes into account proposals for the development of the municipalities. Key features of these IDPs are that they seek to achieve integrated and sustainable settlement while at the same time ensuring the environmental sustainability of the area.

Other legislation related to the environment includes:

- **Atmospheric Pollution Prevention Act, 1965**
- **Environment Conservation Act (ECA), 1989**
- **Genetically Modified Organisms Act, 1997**
- **Water Services Act, 1997**
- **Marine Living Resources Act, 1998**
- **National Water Act, 1998**
- **National Veld and Forest Fire Act, 1998**
- **National Forests Act, 1998**
- **Mineral & Petroleum Resources Development Act, 2002**
- **National Air Quality Management Act, 2004**
- **National Energy Act, 2008**
- **Integrated Coastal Management Act, 2008**

These legislative acts can be individually located [here](#).

C. Institutions Related to the Environment

Many government institutions in South Africa are involved, at some level, in environmental planning and natural resource management. The following is an accounting of departments with their associated agencies that are directly involved in environmental matters and biodiversity-related decisions.¹²

Department of Agriculture, Forestry & Fisheries

Strategic Goals include increased profitable production of food, fiber, and timber products by all categories of producers and sustained management of natural resources. The Forestry branch manages some of the indigenous forests but is primarily responsible for the regulation of the agri-forestry sector.

Department of Energy

The Department's strategic plan seeks to deliver results that include promoting energy security through reliable, clean, and affordable sources; universal access to energy sources, transformation of the energy sector, and strengthening the operations and management of the Department.

Department of Environmental Affairs

Strategic objectives include protecting and improving the quality and safety of the environment, managing and protecting South Africa's oceans and coastal resources, facilitating an effective national mitigation and adaptation response to climate change, and promoting conservation and the sustainable use of natural resources to contribute to economic growth and poverty alleviation. Important statutory bodies of the Department of Environmental Affairs include:

¹² Websites for each of these national-level departments are located at: <http://www.info.gov.za/aboutgovt/dept.htm>

South African National Parks

SANParks manages a system of parks which represents the indigenous fauna, flora, landscapes, and associated cultural heritage of the country. Many of South Africa's indigenous forest areas are managed by SANParks.

South African Weather Service

SAWS is the provider of relevant services in respect of weather, climate, and related products, which contribute to sustainable development in South Africa.

South African National Biodiversity Institute

SANBI leads and coordinates research, and monitors and reports on the state of biodiversity in South Africa. SANBI engages in ecosystem restoration and rehabilitation, and manages the National Botanical Gardens as "windows" to South Africa's biodiversity.

Department of Science & Technology

The Department coordinates and manages a national system of research and employs some of the top scientists in their fields. Environmental emphasis areas for the Department of Science & Technology are climate change mitigation and adaptation as well as water quantity and quality issues and biodiversity. The Department's Socio-Economic Partnership program has a Climate Change and Biodiversity work unit. The Department funds the Council on Science and Industrial Research (CSIR).

Department of Tourism

The Department promotes responsible and sustainable tourism for the benefit of all South Africans. The Department of Tourism emphasizes efficient and responsible use of energy and other natural resources, coordinates climate change initiatives in the tourism sector, and implements programs and initiatives promoting universal access to tourism products, attractions, and services by all sectors of South Africa's society.

Department of Water Affairs

The Department is the custodian of South Africa's water resources, primarily responsible for the formulation and implementation of policy governing this sector. While striving to ensure that all South Africans gain access to clean water and safe sanitation, the water sector also promotes effective and efficient water resources management to ensure sustainable economic and social development.

Department Rural Development and Land Reform

The Department is responsible for administering the land tenure, rural development, and land reform programs.

Provincial Conservation Departments and Statutory Agencies

The following departments and statutory agencies are directly responsible for environmental and biodiversity conservation for the nine South African provinces:

- Eastern Cape Department of Economic Development and Environmental Affairs
 - Eastern Cape Parks – responsible for protected area management
- Free State Department of Economic Development, Tourism and Environmental Affairs
- Gauteng Department of Agriculture, Conservation, Environment and Land Affairs
- KwaZulu-Natal Department of Agriculture, Environment Affairs and Rural Develop-

ment

- Ezemvelo KZN Wildlife – responsible for protected area management
- Limpopo Department of Economic Development, Environment and Tourism
 - Limpopo Tourism and Parks – responsible for protected areas
- Mpumalanga Department of Economic Development, Environment and Tourism
 - Mpumalanga Parks Board – responsible for protected area management
- Northern Cape Department of Environmental Affairs and Nature Conservation
- North West Province Department of Economic Development, Environment, Conservation and Tourism
 - North West Parks and Tourism Board – responsible for protected area management
- Western Cape Department of Environmental Affairs and Development Planning
 - Cape Nature – responsible for biodiversity conservation

D. Major Non-Governmental Organizations (NGOs) Working in South Africa

A large variety of Non-Governmental Organizations are working in areas of the environment and natural resource management in South Africa. Four of these organizations (Institute of Natural Resources, Wildlife and Environment Society of South Africa, Food & Trees for Africa, and Wildlands Conservation Trust) are local South African NGOs. Other NGOs are supporting projects in South Africa but are regional or international in their mission. The following is a non-inclusive list of key environment and natural resource NGOs operating in South Africa. A description of these NGOs is found in Appendix C.

- **Institute of Natural Resources (INR)**
- **Wildlife and Environment Society of South Africa (WESSA)**
- **Food & Trees for Africa (FTFA)**
- **Wildlands Conservation Trust (WCT)**
- **African Wildlife Foundation (AWF)**
- **Conservation South Africa (CSA) and Conservation International (CI)**
- **Fauna & Flora International (FFI)**
- **Resource Africa (RA)**
- **World Wildlife Fund (WWF)**
- **Peace Parks Foundation (PPF)**
- **Endangered Wildlife Trust (EWT)**

E. Donor Organizations, with Recent, Current, and Proposed Activities

The types of projects and activities carried out in South Africa in environmental conservation vary from donor to donor. Coordination among the multitude of donors operating in South Africa on environmental issues and biodiversity conservation is critical to ensure efforts create synergies and do not become redundant. The following is a non-inclusive list of the environmental conservation donor organizations operating in South Africa. A description of these donor organizations is found in Appendix C.

- **World Bank (WB)**
- **Development Bank of Southern Africa (DBSA)**
- **German Agency for International Cooperation (GIZ)**
- **United Nations Development Programme (UNDP)**
- **United Nations Environment Programme (UNEP)**
- **Global Environment Facility (GEF)**

F. Conservation Activities of the Commercial Private Sector

Where previously the state took the major responsibility in establishing protected areas with viable game populations and developed and managed the tourism enterprises within that estate, a major shift has taken place since the 1980s. The state's priorities have shifted from controlling and protecting natural resources and biodiversity, to policies that focus on facilitating the sustainable utilization of resources, by transferring commercial and resource benefits to the private sector and previously disadvantaged people.

Today more of the larger mammals are protected on private commercial game farms and game reserves than within formally protected areas. The tourism private sector in South Africa is managing almost all the lodges and resorts within formally protected areas and on private land.

III. STATUS AND MANAGEMENT OF NATURAL RESOURCES

The Republic of South Africa is often described as one of the most biologically diverse countries in the world. Conservation International describes South Africa as one of the 17 “megadiverse” countries. Despite having lost some unique and endemic species in the early days of western colonization, South Africa today has a good record in managing its unique and diverse biodiversity and natural resources.

South African conservation leaders have a good understanding of its natural resources and the challenges to biodiversity conservation. It has developed comprehensive legislation, management strategies, tools, and policies to deal with environmental protection, backed by a substantial research and institutional capacity. Please see Appendix D for a discussion of the importance of conserving biological diversity.

A. General Status and Management of Natural Resources

South Africa has one of the world's greatest diversity of plant and animal species contained within one country, and is home to many species found nowhere else in the world. Terrestrial resources are rapidly disappearing however, due to conversion of natural habitat to farmland, forestry, human settlement, and industrial development. Some species are under threat from over-collection for medicinal, ornamental, and horticultural purposes.

South Africa is regarded as being sensitive to climate change. Although emissions are within acceptable levels, there are occasions in the major urban areas where concentrations could lead to health problems in people who are already experiencing respiratory problems. Amongst poor communities, indoor air quality specifically constitutes a health hazard in poorly ventilated dwellings without chimneys, where coal, wood, paraffin, or dung is used as fuel. Susceptible terrestrial and freshwater ecosystems are likely to show adverse effects of acid deposition in a few decades if the current emission rates are continued or increased.

Degradation of vegetation and soils is also a widespread problem. Rapid urban development, cultivation in unsuitable areas, and use of poor agricultural methods are the main causes.

South Africa's available freshwater resources are almost fully utilized and under stress. It is unlikely that the projected demand on water resources in South Africa can be sustainable. Supply will become a major restriction to the future socio-economic development of the country, in terms of both the quality and quantity of available water. Many water resources are polluted by industrial effluents, domestic and commercial sewage, acid mine drainage, agricultural runoff, and litter. To augment supplies, South Africa is looking towards water sources in other southern African countries (e.g. Lesotho).

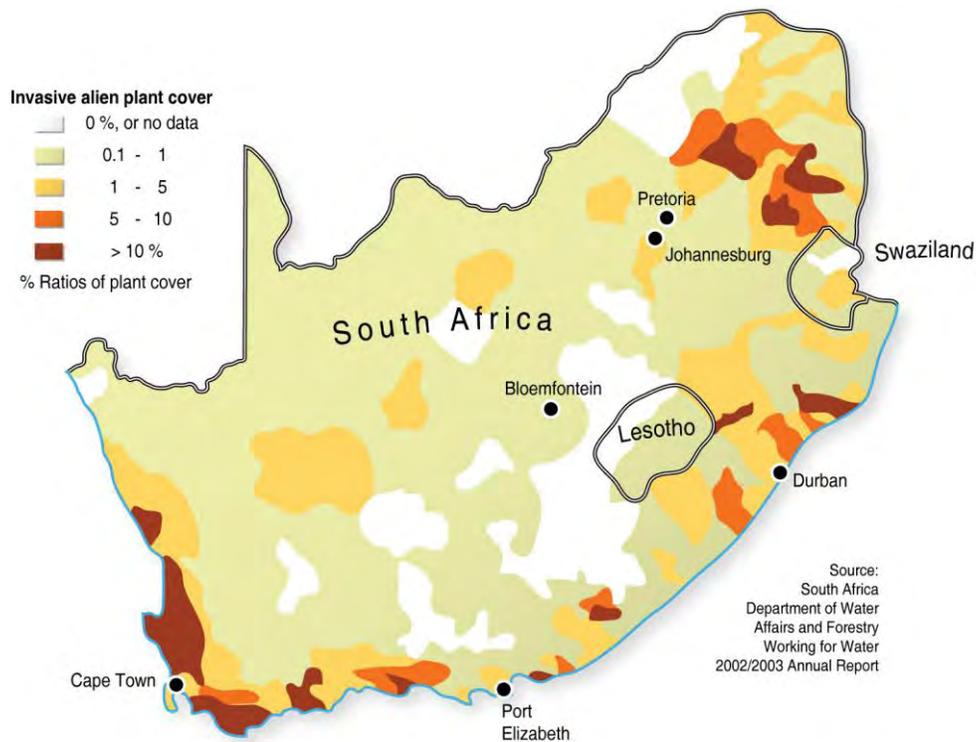
South Africa's coastal and marine resources are under considerable threat and are already severely degraded in many areas due to over-harvesting and urban/industrial development.

People are dependent on the natural environment for meeting all their needs, and therefore the interactions between people and the environment cannot be separated. Political, economic, and social inequities of the past have resulted in high poverty rates, high levels of illiteracy and unemployment, and distorted patterns of resource use and waste generation. The rapid growth rate and resettlement of the population around urban centers is a critical factor.

Invasion by alien plant and animal species is also a major problem. Some alien vegetation has been introduced accidentally, while others were brought in for commercial purposes (such as the pine and eucalypt plantations for wood fiber production). The fynbos vegetation types in the Western Cape area are particularly vulnerable to displacement. The stresses put on native vegetation from a changing

climate could also affect the endemic's ability to maintain a presence. Please refer to the following map for a description of the extent of alien plant invasions in South Africa.

Figure 8. Invasive Alien Plant Cover in South Africa



Economics and the environment are inextricably linked, as natural resources are the basis of production, manufacturing, and waste disposal. Previous macro-economic policies such as subsidizing polluting activities, and artificially lowering the costs of energy and water use, have led to resource degradation and depletion. At present the economy is growing, but at a slow rate, and unemployment is high, and increasing. This is contributing to unsustainable resource use, polluting activities, and dependency on increasingly degraded natural resources.

The inclusion of environmental rights in the Constitution, the development of a plethora of new environmental management policies committed to sustainable development, and a marked increase in donor funding for environmental management are positive changes in the new South African political context (please refer to the section above). These changes have arisen from both national and international drivers, and are impacting redirection of resources within the country from traditional conservation to people-centred sustainability management. However, the challenge for the future lies in commitment to implementation, as financial and human resources have not yet been allocated in proportion to the rapid developments in policy. Implementation must occur within the overall government objectives of socio-economic growth and development, alleviation of poverty, reduction of unemployment, and redress of inequity, to ensure sustainability of resources and ecosystem services for future generations. A critical requirement which still needs to be developed is effective measurement and reporting systems of implementation success.¹³

¹³ <http://www.ngo.grida.no/soesa/nsoer/>

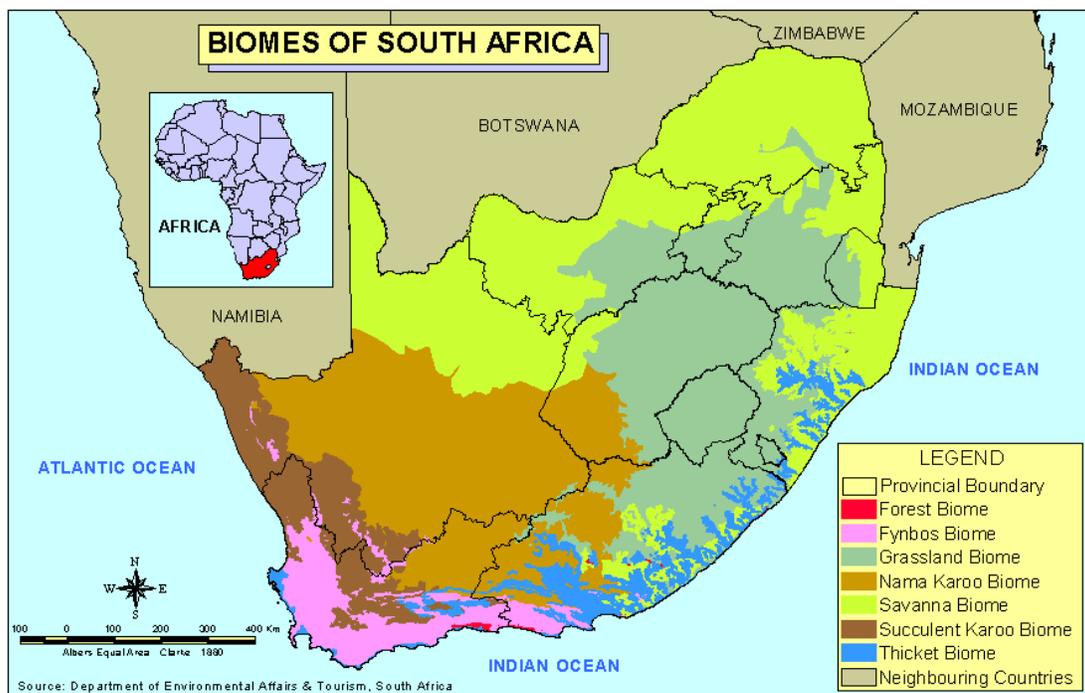
During the period 2003 to 2005, a National Biodiversity Strategy and Action Plan (NBSAP) was developed that sets out a framework and a plan of action for the conservation and sustainable use of South Africa's biological diversity and the equitable sharing of benefits derived from this use. This was followed by the Protected Areas Expansion Strategy in 2007, which aims to establish a representative and effectively managed system of protected areas as a key strategic approach in the conservation of South Africa's biodiversity and in adaptation to the impacts of climate change. At the time of the preparation of this 118/119 assessment, a new National Biodiversity Assessment was being prepared and is scheduled for release in mid-2012.

South Africa also published two climate change publications during 2011 (Davis 2011, Department of Environmental Affairs 2011) in preparation for the 17th Conference of the Parties to the UNFCCC in Durban. These papers provide the latest trends and projections for temperature, precipitation, and CO₂ along with describing risks from climate change and possible mitigation and adaptation measures. A national climate change response white paper (Government of the Republic of South Africa 2011) was also published outlining how climate change would be incorporated into the country's overall social objectives.

A1. South Africa's Biomes

Biomes can be defined as the major plant communities of the world, classified according to their predominant vegetation and characterized by adaptations of organisms to that particular environment. Ecosystems are communities of organisms that inhabit specific physical environments. Biomes are composed of several ecosystems and represent a regional community of organisms named after the dominant vegetation. The context of the status and management of plant and animal natural resources is based on the seven primary biomes classified for South Africa. Figure 9 displays the location and extent of South African biomes and a discussion of each is found in the subsequent paragraphs.¹⁴

Figure 9. Biomes of South Africa.



¹⁴ Primary source: <http://www.environment.gov.za/enviro-info/nat/biome.htm#top>

Forests. The forest biome of South Africa includes the indigenous evergreen and semi-deciduous closed forests of the coastal lowlands and escarpment slopes. Forests cover only about 0.25% of the land area. With a few exceptions such as the forests of the Knysna area and the KwaZulu-Natal coastal dune systems, forests are small, usually occupying less than 1000 hectares. These forests amount to little more than patches scattered through the higher rainfall areas. The total area of forests in South Africa is probably less than 2000 km². Despite the small land surface area that they occupy, forests have relatively high species richness. Only the fynbos biome exceeds the species richness found in forests.

Fynbos. Fynbos occurs almost exclusively in the southwestern and southern parts of the Western Cape Province and occupies about 7% of South Africa. Fynbos comprises evergreen heathlands and shrublands in which fine-leaved low shrubs and leafless tufted grasslike plants are typical. Trees are rare and grasses comprise a relatively small part of the biomass.

Wildfire is a very important component in fynbos. Most fynbos is highly combustible due to the common presence of flammable oils. Finely wooded fynbos plants are obligate seeders, which means that the whole plant dies after fire and can only reproduce through seed. This distinguishes fynbos from the other ecosystems where wildfire is common. Many plant species are dependent for pollination on small mammals or birds such as the Cape sugarbird (*Promerops cafer*).

Economic utilization of fynbos vegetation is limited to selective grazing by small stock on newly burned lowland areas and to wildflower production. Most commonly utilized are the protea species, which are exported fresh or dried. The floristic diversity of the fynbos is not paralleled by an equally rich fauna due to the absence of grass and berry-producing plants. The fynbos biome also defines the Cape Floristic Region Biodiversity Hotspot, described in further detail below.

Grasslands. The high central plateau of South Africa, inland areas of Kwazulu-Natal, and the mountain areas of the Eastern Cape Province are covered by grassland, representing about 28% of the country's surface area. Grasslands are defined as those areas where grasses dominate the vegetation and where woody plants are absent or rare. Most of the grassland occurs in high-rainfall areas, where thunderstorms and hail are common in summer and frost is common in winter.

The grassland biome is regarded as the third-richest area in terms of plant species diversity, with a total number of 3788 species. This biome is economically important for the agriculture and grazing industries it supports.

Nama-Karoo. Most of the vast central plateau region of the Western and Northern Cape Provinces is covered by the Nama-Karoo. This is 28% of the country's land cover. The area forms an ecotone or transition between the Cape flora to the south, and the tropical savanna in the north. Many of the plant species of the Nama-Karoo also occur in the savanna, grassland, succulent Karoo, and fynbos biomes.

Species that occur in the Nama-Karoo include the sweet-thorn (*Acacia karroo*), stone plant (*Lithops ruschiorum*), and blue Karoo daisy (*Felicia australis*). The former vast migratory herds of springbok

Figure 10. Example of Fynbos Vegetation Type.



(*Antidorcas marsupialis*) have been replaced by domestic stock, particularly sheep and goats. A rich variety of rodents and reptiles also occurs in the Nama-Karoo. The few, endemic or near-endemic bird species include the Sclaters lark (*Spizocorys sclateri*).

Savannas. Savannas are wooded grasslands of the tropics and subtropics that represent 34% of the South African landscape. They are second only to tropical forests in terms of their contribution to terrestrial primary production. They are the basis of the livestock and wildlife industries. These areas host a great variety of large mammals that are popular with the tourism industry, including the so-called “[Big Five](#)” species. This large diversity of animals is associated with the rich plant diversity.

Savannas also include valley [bushveld](#), the [veld](#) type containing the greatest range of rainfall seasonality in South Africa. Wildfire is a crucial factor in the ecology of all savannas and is therefore a regular natural feature of this environment.

Succulent Karoo. The Succulent Karoo is determined by low winter rainfall and an extremely arid summer. This biome occurs mostly west of the western escarpment of the Western Cape and inland towards the Nama-Karoo. It is 8% of South Africa’s surface. This area is well known for its spring flowers which draw large numbers of tourists from all over the world.

Succulent plant species with thick, fleshy leaves are plentiful here, the diversity of which is unparalleled anywhere else in the world. Combined with many geophytes and annual plants, this makes the Succulent Karoo unique and of international importance in terms of conservation. The Succulent Karoo biome also defines the Succulent Karoo Biodiversity Hotspot, described in further detail below.

Thicket. This is a transitional biome between many of the other biomes in South Africa and covers only 3% of the country’s surface area. The vegetation which replaces forest (where a degree of fire protection is still evident, but rainfall is too low) does not fit within the Forest Biome as it does not have the required height or the many strata below the canopy. It is also not a Savanna Biome, in that it does not have a conspicuous grassy ground layer. The thicket is a closed shrubland to low forest dominated by evergreen, sclerophyllous, or succulent trees, shrubs and vines, many of which have stem spines. It is often almost impenetrable, is generally not divided into strata, and has little herbaceous cover. Thicket types contain few endemics, most of which are succulents of Karoo origin.

A2. Areas of Special Biodiversity Significance

Conservation International has identified three “biodiversity hotspots” in South Africa. No other country in the world has been identified with more than one. Biodiversity hot spots are regions with more than 1500 endemic species and more than 70% habitat loss in historic times (the baseline varies between regions, but typically lies several centuries back). The three biodiversity hot spots in South Africa are described below.¹⁵

Cape Floristic Region

The Cape Floristic Region is home to the greatest non-tropical concentration of higher plant species in the world, with 9000 species crammed into its small extent. Incredibly, more than 6200 (69%) of these species are found nowhere else in the world. Furthermore, five of South Africa's 12 endemic plant families and 160 endemic genera are found only in this hotspot.

Certain genera have undergone massive diversification. The 10 largest genera account for 22% of the flora with the two most species rich being Erica (*Ericaceae*: 658 species) and Aspalathus (*Fabaceae*: 257

¹⁵ <http://www.biodiversityhotspots.org/>

species). Species richness and local endemism is greatest in the southwest; the Cape Peninsula (471 km²) alone supports 2256 species (including 90 endemics).

Among the most recognized plant species in the hotspot are the proteas, particularly the king protea (*Protea cynaroides*), which is South Africa's national flower, and the red disa (*Disa uniflora*). Also worth a mention is the Clanwilliam cedar (*Widdringtonia cedarbergensis*), a graceful but declining relict conifer endemic to the Cederberg Mountains in the northwestern part of the region.

Table 3. Cape Floristic Region “Vital Signs.”

Measure	Quantity
Hotspot Original Extent (km ²)	78,555
Hotspot Vegetation Remaining (km ²)	15,711
Endemic Plant Species	6,210
Endemic Threatened Birds	0
Endemic Threatened Mammals	1
Endemic Threatened Amphibians	7
Extinct Species†	1
Human Population Density (people/km ²)	51
Area Protected (km ²)	10,859
Area Protected (km ²) in Categories I-IV*	10,154



Recorded extinctions since 1500. *Categories I-IV afford higher levels of protection.

Succulent Karoo

The Succulent Karoo of South Africa and Namibia boasts the richest succulent flora on earth, as well as remarkable endemism in plants, with 69% as endemics. Reptiles also show relatively high levels of endemism in the region. It is home to the mysterious tree-like succulent, the halfmens (*Pachypodium nanoquanium*), as well as many unique species of lizards, tortoises, and scorpions.

Grazing, agriculture, and mining, especially for diamonds and heavy metals, threaten this fragile region. Fortunately, low population levels have allowed for greater preservation in the Succulent Karoo when compared to other more densely populated regions.

The Succulent Karoo is one of only two hotspots that are entirely arid (the other is the newly recognized Horn of Africa). The region is commonly divided into two zones. The first, Namaqualand, extends along the west coast of South Africa and southern Namibia. It is a winter rainfall desert with a mild climate moderated by cold Atlantic Ocean currents. The mild climate has contributed to the evolution of a rich array of endemic species. The second zone, the Southern Karoo, experiences peaks of rainfall in spring and autumn and has more extreme climate variations than the Namaqualand desert.

Dwarf shrubland dominated by leaf succulents is found throughout the hotspot. These drought-adapted plants have thick, fleshy leaves or stems for water storage. In the Succulent Karoo, there are about 1700 species of leaf succulents, and this dominance is unique among the world's deserts. The recent and explosive diversification of the *Mesembryanthemaceae*, the largest group, has been described as an event unrivaled among flowering plants. Stem succulents are also found here (around 140 species), as are seasonal bulbs and annuals that display magnificent spring blooms in the open spaces between the shrubs,

particularly during the spring in the Namaqualand. Hilly areas in the southern Karoo are dotted with evergreen shrubs and tall aloes.

Table 4. Succulent Karoo “Vital Signs.”

Measure	Quantity
Hotspot Original Extent (km ²)	102,691
Hotspot Vegetation Remaining (km ²)	29,780
Endemic Plant Species	2,439
Endemic Threatened Birds	0
Endemic Threatened Mammals	1
Endemic Threatened Amphibians	1
Extinct Species†	1
Human Population Density (people/km ²)	4
Area Protected (km ²)	2,567
Area Protected (km ²) in Categories I-IV*	1,890



†Recorded extinctions since 1500. *Categories I-IV afford higher levels of protection.

Maputaland-Pondoland-Albany

Maputaland-Pondoland-Albany, which stretches along the east coast of southern Africa below the Great Escarpment, is an important center of plant endemism. The region’s warm temperate forests are home to nearly 600 tree species, the highest tree richness of any temperate forest on the planet. The celebrated bird-of-paradise flower is a distinctive hotspot endemic.

The rescue of the southern subspecies of white rhinoceros from extinction, which took place in this hotspot, is one of the best-known success stories in African conservation. Regrettably, much of the once expansive grasslands and forests in which many of the large mammals dwell are facing increased threats from industrial and local farming and also the expansion of grazing lands.

The region is floristically, climatologically, and geologically complex. The topography of the region ranges from ancient sand dunes and low-lying plains in the north to a series of rugged terraces deeply incised by river valleys in the central and southern parts. The hotspot also incorporates several mountain ranges. The area is bordered on the west by the Great Escarpment, which separates the elevated interior plateau of southern Africa from the coastal lowlands.

The hotspot’s vegetation is comprised mainly of forests, thickets, bushveld, and grasslands. About 80% of South Africa’s remaining forests fall within this hotspot. The area also has a remarkable succulent flora, principally in the Albany region; these are mainly stem succulents, as opposed to the dominant leaf succulents found in the Succulent Karoo. One type of forest (Licuáti forest), three types of thicket, six types of bushveld, and five types of grassland are restricted to the hotspot.

Table 5. Maputaland-Pondoland-Albany “Vital Signs.”

Measure	Quantity
Hotspot Original Extent (km ²)	274,136
Hotspot Vegetation Remaining (km ²)	67,163
Endemic Plant Species	1,900
Endemic Threatened Birds	0
Endemic Threatened Mammals	2
Endemic Threatened Amphibians	6
Extinct Species†	0
Human Population Density (people/km ²)	70
Area Protected (km ²)	23,051
Area Protected (km ²) in Categories I-IV*	20,322



†Recorded extinctions since 1500. *Categories I-IV afford higher levels of protection.

B. Status and Protection of Protected Areas

South Africa has a long history of proclaiming conservation areas, however the historic establishment of conservation areas was ad hoc, focusing on land with low economic potential or high tourism potential. South Africa has a well-developed system of protected areas. These vary from National Parks, Provincial and Local Authority Nature Reserves and Forest Nature reserves to Mountain Catchment Areas, Wildlife Management Areas, private nature reserves, National Heritage Sites, Forest Areas, bird sanctuaries, botanical gardens, and Peace Parks.

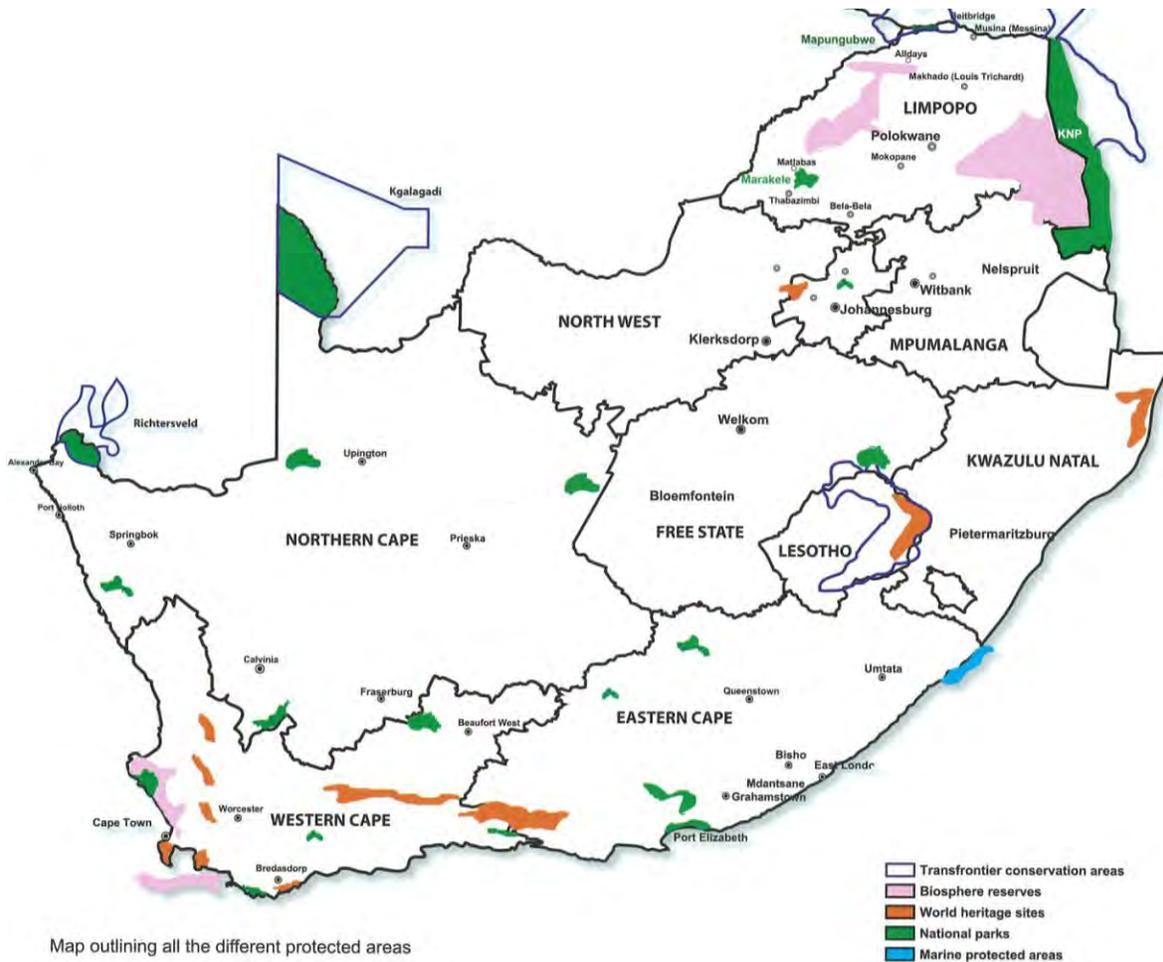
Currently, approximately 7.5% of the country’s total land area is in some form of formal protection. Appendix E lists the major individual protected areas in South Africa. Figure 11 displays the larger protected areas of South Africa. A complete list of current protected areas can be found at: <http://www.protectedplanet.net/countries/203>. The sections following the map describe protected areas by their category and level of protection.

B1. Formally Protected Areas under International Protocols

World Heritage Sites

World Heritage Sites recognize and protect areas of outstanding natural, historical, and cultural value. The convention on World Heritage Sites of the United Nations Educational, Scientific and Cultural Organization (UNESCO) was established in 1972. Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation, and transmission to future generations of its cultural and natural heritage situated on its territory belongs primarily to that State and agreed to take effective and active measures to that effect. Figure 11 shows a map of South African World Heritage Sites and Appendix E displays a list.

Figure 11. Major Protected Areas of South Africa.¹⁶



Ramsar Wetlands Sites

The Convention on Wetlands (Ramsar, Iran, 1971) is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their Wetlands of International Importance and to plan for the "wise use," or sustainable use, of all of the wetlands in their territories. Unlike the other global environmental conventions, Ramsar is not affiliated with the United Nations system of Multilateral Environmental Agreements (MEA), but it works very closely with the other MEAs and is a full partner among the "biodiversity-related cluster" of treaties and agreements.¹⁷ The Convention on Wetlands came into force for South Africa in 1975. Appendix E displays a list of South African Wetlands of International Importance.

¹⁶ Source: People and Parks Programme. Available at: <http://www.peopleandparks.com/about>

¹⁷ <http://www.ramsar.org/>

Biosphere Reserves

A biosphere reserve is a voluntary, cooperative, conservation reserve created to protect the biological and cultural diversity of a region while promoting sustainable economic development. It is a place of cooperation, education, and experimentation, where scientists and managers can share research data to better understand man's impact on nature, and where local communities, environmental groups, and economic interests can work collaboratively on conservation and development issues.

Biosphere reserves are established under the auspices of United Nations Educational, Scientific, and Cultural Organization (UNESCO) Programme on Man and the Biosphere (MAB). The mission of the MAB Program, as established in 1974, is to achieve a sustainable balance between the sometimes conflicting goals of conserving biological diversity, promoting economic development, and maintaining cultural values. Biosphere reserves are the sites where this objective is tested, refined, demonstrated, and implemented.¹⁸ Figure 11 shows a map of South African Biosphere Reserves and Appendix E displays a list.

Peace Parks

The establishment and development of transfrontier conservation areas, or Peace Parks, is a multi-faceted approach to jointly manage natural resources across political boundaries. The Peace Park initiative is relatively new and many designations are still in the conceptual phase. Peace Parks usually integrate existing conservation efforts and formal protected areas neighboring each other across international borders and are formalized through international treaties between the respective heads of state. Peace Park designations are primarily coordinated through the Peace Parks Foundation¹⁹ with cooperation from the participating governments. Conserving biodiversity as well as stimulating job creation by developing nature conservation as a land-use option are the primary objectives for Peace Park designations. An ancillary objective is to foster cooperation along the borders of countries that may have formally been at odds with each other.

A list of Peace Parks in South Africa is included in Appendix E.

B2. Formally Protected Areas under the National Environmental Management: Protected Areas Act Of 2003

The aim of the National Environmental Management: Protected Areas Act of 2003 (NEM:PAA) is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes, and seascapes. The act was amended in 2004 to include national parks and marine protected areas. The objectives of NEM:PAA are:

- to provide for the declaration and management of protected areas;
- to provide for cooperative governance;
- to effect a national system of protected areas in South Africa as part of a strategy to manage and conserve biodiversity;
- to provide for a representative network of protected areas on state land, private land, and communal land;

¹⁸ <http://www.unesco.org/mab>

¹⁹ <http://www.peaceparks.org/>

- to promote sustainable utilization of protected areas for the benefit of people in a manner that would preserve the ecological character of such areas;
- to promote participation of local communities in the management of protected areas, where appropriate; and
- to provide for the continued existence of South African National Parks.

The Protected Areas Act allows for the designation of four types of reserves, as described below.

Special Nature Reserves

The only current example of a Special Nature Reserve is the Prince Edward Islands in the Indian Ocean. The Minister of Environmental Affairs may by notice declare an area to be a special nature reserve:

- to protect highly sensitive, outstanding ecosystems, species or geological or physical features in the area; and
- to make the area primarily available for scientific research or environmental monitoring.

A notice declaring a special nature reserve on private land may be issued if the owner has consented by written agreement with the Minister. Any such agreements are binding on the successors in title to the landowner, and the terms must be registered against the title deeds of the land.

National Parks

There are 19 national parks in South Africa, many of which are world renowned such as Kruger and Table Mountain National Parks. The Minister may by notice declare an area to be a national park:

- to protect the area if the area is of national or international biodiversity importance or is or contains a viable, representative sample of South Africa's natural systems, scenic areas, or cultural heritage sites;
- to protect the ecological integrity of one or more ecosystems in the area;
- to prevent exploitation or occupation inconsistent with the protection of the ecological integrity of the area;
- to provide spiritual, scientific, educational, recreational, and tourism opportunities which are environmentally compatible; and
- to contribute to economic development, where feasible.

A notice declaring a national park on private land may be issued if the owner of the land has consented to the declaration by way of a written agreement with the Minister or South African National Parks. Figure 11 shows a map of South African National Parks and Appendix E displays a list.

Nature Reserves

Two categories of nature reserves exist in South Africa, those proclaimed by provincial government and those proclaimed by private land owners. Close to 200 such nature and game reserves are managed by the provincial agencies or the private sector. These include some of the best known private game reserves (such as Sabi-Sand next to Kruger Park) and provincial nature reserves (such as the Blyde River Canyon Nature Reserve). The Minister or a Member of the Executive Council (MEC) may by notice declare an area to be a nature reserve:

- to protect the area, if the area:
 - has significant natural features or biodiversity;
 - is of scientific, cultural, historical or archaeological interest; or
 - is in need of long-term protection for the maintenance of its biodiversity or for the provision of environmental goods and services;
- to provide for a sustainable flow of natural products and services to meet the needs of a local community;
- to enable the continuation of such traditional consumptive uses as are sustainable; or
- to provide for nature-based recreation and tourism opportunities.

A notice declaring a nature reserve on private land may be issued if the owner has consented by written agreement with the Minister or the MEC. Any such agreements are binding on the successors in title to the landowner, and the terms must be registered against the title deeds of the land.

Protected Environments

Currently, the only listed Protected Environment in South Africa is the core area of the Magaliesberg. An application is currently being prepared to include the Magaliesberg Protected Environment, with the Cradle of Human Kind World Heritage Site and the Kgaswane Nature Reserve in the North West Province, into a new Biosphere Reserve under the UNESCO Man and Biosphere program. The Minister or the MEC may by notice declare an area to be a protected environment:

- to regulate the area as a buffer zone for the protection of a special nature reserve, world heritage site, or nature reserve;
- to enable owners of land to take collective action to conserve biodiversity on their land and to seek legal recognition therefore;
- to protect the area if the area is sensitive to development due to its:
 - biological diversity;
 - natural characteristics;
 - scientific, cultural, historical, archaeological or geological value;
 - scenic and landscape value; or

- provision of environmental goods and services;
- to protect a specific ecosystem outside of a special nature reserve, world heritage site, or nature reserve;
- to ensure that the use of natural resources in the area is sustainable; or
- to control change in land use in the area if the area is earmarked for declaration as, or inclusion in, a nature reserve.

A private landowner may request or consent to the declaration of their land as a protected environment and the Minister or MEC may withdraw the declaration as a protected environment.

Marine Protected Areas

The application of protected areas in the sea is promulgated under the Marine Living Resources Act of 1998 (MLRA) as opposed to the Protected Areas Act described above. The first marine protected area (MPA) was declared in South Africa in 1964 (Tsitsikamma). There are 21 MPAs in South Africa, listed in Appendix E. The MLRA lists the three objectives of MPAs as (1) the protection of marine life, (2) the facilitation of fisheries management, and (3) the reduction of user-conflict.

In South Africa, the management of MPAs and fisheries is controlled by the same policy and legislation. The concept of “no take” is important in South African MPAs. Eight of the 21 MPAs are completely “no take” areas.²⁰

B3. Other Forms of Protection

Stewardship Programs

Biodiversity Stewardship programs work with landowners to draw up agreements of varying degrees of legal commitment and resulting benefits to the landowner:

- the site can become a conservation area (a decision that is not legally binding and of no specific duration),
- a landowner can enter into a legally binding biodiversity (management) agreement or a declared protected environment with a legal binding contract, or
- the property can be declared as a nature reserve, with a legally binding long-term contract, and with a title deed restriction.

All options are entered into voluntarily and the landowner retains the property title deed. As part of the agreement, the nature conservation agency draws up a biodiversity-focused management plan tailored to suit the specific needs of the owner and the property. As part of the agreement, the conservation authority usually undertakes all legal work to set up the contract and to ensure the relevant declaration. In addition, the conservation authority will provide conservation extension services, and possibly secure assistance of the agricultural and water sectors to assist with other extension advice. If secured as a protected environment or nature reserve, there are substantial benefits in terms of tax rebates and exemptions.

²⁰ [http://www.wwf.org.za/what we do/marine/mpas/](http://www.wwf.org.za/what_we_do/marine/mpas/)

Conservancies

A conservancy is a voluntary association between land users/landowners who cooperatively wish to manage their natural resources in an environmentally friendly manner without necessarily changing the land-use of their properties. Some but not all conservancies are registered with their relevant provincial conservation authorities and some are affiliated with the National Association of Conservancies of South Africa (NACSA).

In a conservancy, a group of individuals, landowners, or businesses who are concerned with the state of their environment or who wish to monitor and enhance it, may do so by volunteering to be part of a conservancy, which is preferably registered with their local nature conservation agency. “Co-operative environmental management” means that a conservancy manages an area in accordance with sound environmental principles as prescribed by the various laws and policies of the nature conservation authorities in their area. The land owners retain title to their land and no formal registration against title is required. Government is encouraging conservancies to follow the Stewardship Programs mentioned above that requires them to enter into formal agreements with the relevant authorities and to develop biodiversity-focused management plans for the land they occupy.

C. Status and Protection of Endangered and Threatened Species

The number of threatened species (defined as critically endangered, endangered, and vulnerable) on the World Conservation Union (IUCN) Red Book List for South Africa is remarkably high at 444. By comparison, Botswana has 19 threatened species listed and Zimbabwe has 56. Much of the high number of listed species can be explained by the large diversity already described for South Africa, both for terrestrial and marine ecosystems. An abbreviated list of the IUCN Red Book List for South Africa is provided in Appendix F. This list only displays those species with an assessed population trend (147 out of 444). Of these, the vast majority are exhibiting a deteriorating trend, with only 18 showing an improving or stable trend.

There are three main types of special status that a species may have in South Africa: (1) A threatened or protected species, listed under the National Environmental Management Biodiversity Act (NEMBA) regulations on Threatened and Protected Species; (2) a species listed on one of the Appendices of the Convention on International Trade in Endangered Species (CITES), to which South Africa is a signatory; or (3) a species that has been assessed for its conservation status using the IUCN criteria for red-listing of species.

Protection of endangered species in South Africa is primarily accomplished through enforcing provisions of the National Biodiversity Act and the National Protected Areas Act. Protected areas management has been effective in maintaining and preserving habitat for endangered species but not as effective to deter some illegal harvest. Currently, the most visible example of an ineffective protection scheme is the illegal poaching of rhinoceros horns used in Oriental medicinal practices, with over 300 rhinos lost in the Kruger National Park area alone in 2011. Endangered plants are also being illegally harvested for medicinal trade.

The Endangered Species Protection Unit (ESPU) of the South African Police Service was formed in 1989 to curtail the international trade in endangered species. The specialized functions of the ESPU includes investigation and preventing of any criminal conduct in respect to hunting, importation, exportation, possession, and buying and selling of such endangered species or any of their products. The [ESPU](#) operates with only 40 members.

The summary table below provides a comparison of South Africa’s own legislation regulating species (NEMBA Regulations: Threatened and Protected Species Assessment) and those of the IUCN and CITES.

Table 6. Comparison of Three Assessment Tools for Endangered and Threatened Species’ Status

NEMBA Regulations on Threatened and Protected Species	CITES	IUCN Red List Assessments
The focus is on activities that can be regulated using permits.	The focus is on international trade.	The focus is on threats causing a high risk of extinction.
Species are listed under threatened or protected categories.	Species are listed on 3 appendices.	Species are listed as Threatened, Near Threatened, Least Concern or Data Deficient.
Species are assessed based on expert opinion.	Species are assessed against a methodology agreed to by the Parties to the Convention.	Species are assessed using the IUCN Red List Categories and criteria.

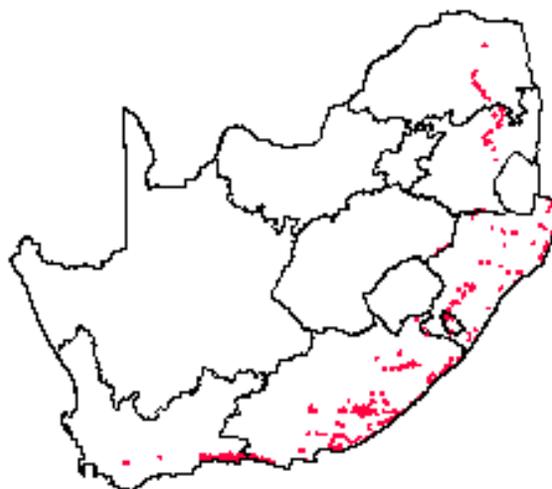
Source: South African National Biodiversity Institute (SANBI)

D. Status and Protection of Forest Resources

Larger indigenous forests that are high growing and dense are mainly found in the southern and eastern parts of South Africa and along the eastern escarpment. They normally occur in areas of high rainfall, high humidity, and on sheltered mountain sides.

South Africa's forests cover less than 1% of the country's total land area. The country never was heavily forested, and an estimated 30% of forests (mainly coastal forests) were lost by the end of the 20th century due to clearance for agriculture and human settlements, as well as timber extraction (mostly during the 19th century). Forests are highly fragmented and isolated, as shown in the figure on the right. Some forest types (especially scarp, coastal and mangrove forests) are still under some pressure from resource use and development.

Figure 12. Indigenous Forest Areas



As opposed to indigenous forests, indigenous woodlands cover almost one third of the surface area of South Africa. This would include proper woodlands of tall growing trees as well as bush land (called bushveld). This type of forest is not so dense and can be found interspersed with savanna grassland.

Because of their importance, forest resources are protected either under the provisions of the National Forests Act of 1998 or as formal protected areas. Because of these two provisions, natural forests are generally considered adequately protected. Around 54% of natural forests are included in protected areas and many also occur on private land. Most indigenous forests are sustainably utilized through a permitting system, although they are under increasing pressure from alien plant invasions and a resulting increase of wildfires. Most of the indigenous forests are managed as part of the national protected area estate by SANParks or by the Department of Agriculture, Forestry and Fisheries, or are managed by provincial conservation agencies.

Forests and woodlands are important to the rural people of South Africa because they provide firewood and materials for fencing, construction, and crafts. However, overuse in areas surrounding villages and towns, persistent drought, overgrazing, wildfires, and the deep-rooted cultural belief of “free for all” on tribal lands have caused drastic declines in forested areas and conversion of areas from productive woodlands to less productive grassland and shrub formations.

South Africa has a well-developed plantation forest industry that supplies most of the country’s commercial wood fiber needs. Approximately 1.4 million hectares are devoted to forest plantations, most in the form of pine and eucalypt species. These plantations are typically monocultural and contribute little to wildlife habitat or biodiversity.

The [State of the Forests Report](#) for 2007-2009, published in 2011; gives a comprehensive analysis of the status and protection of South African forests (Dept. of Agriculture, Forestry, and Fisheries 2011).

E. Biological Diversity Conservation Outside of Protected Areas

Significant amounts of privately owned land outside the formally protected areas are well protected and still in a near-wilderness state. Keeping these areas in a near-pristine condition, where biological diversity is conserved, is sustained through the existence of a very strong commercial game ranch and ecotourism industry. This industry is incentivized by government through progressive policies that allow private land owners to obtain ownership and utilization rights over wildlife within their private estate, provided they comply with certain management requirements. These policies allow private individuals to trade in and harvest animals. This has placed a commercial value on animals which attracted private land owners to convert their properties from extensive cattle farming to commercial game farming and ecotourism.

As a result, large tracts of previous cattle farms, in particularly the bushveld areas, have now been converted to game and safari ranches where the diversity of larger game species has become the major attraction to hunters and tourists. These properties have over the last few decades played a significant role in the protection and increase in numbers of some of the rarest and most endangered species. The success in bringing the white rhino (*Ceratotherium simum*) from the brink of extinction can largely be attributed to the fact that ownership of animals became an attractive business.

Some of the communal land in South Africa that is situated in rural areas has great ecotourism potential as it is often scenically attractive and usually rich in biodiversity. Despite some overgrazing and regular wildfires, the state of the ecology on large tracts of communal land is still reasonably intact, as most of this land is underdeveloped and is predominantly used for extensive communal cattle grazing. Current legislation and the lack of feasible land use policies of government, combined with the limitations of the traditional tribal administrative systems, are denying rural communities from capitalizing on the tourism potential of their land by participating in the growth of the commercial game farming and ecotourism industries. Appropriate policies and models are required that can also assist rural communities to develop potentially feasible land as viable wildlife and nature based natural resource use areas. Until this can be achieved, biodiversity loss in these areas is likely to continue.

IV. THREATS TO BIODIVERSITY AND FOREST CONSERVATION

Threats to biodiversity and natural resources in South Africa were identified during the assessment team's interviews with the conservation professionals from USAID, NGOs, and South African Government agencies. From these interviews, the assessment team prioritized the several dozen threat items mentioned in these interviews into 5 major threats, 8 minor or emerging threats, or threats not pertinent to biodiversity or forest conservation. The major and minor threats are described in detail in the following two sub-sections. The threats not pertinent to biodiversity or forest conservation were those the team determined to be so minor that no USAID program emphasis is necessary or were contradicted by other conservation professionals as being unimportant. Addressing these other threats in this report would therefore be unproductive.

A. Major Threats

1. Invasive Alien Organisms. Invasive plant species displacing native vegetation is a major threat to biodiversity. As mentioned earlier, the fynbos vegetation types in the Western Cape area are particularly vulnerable to displacement and are much more of a concern than the vegetation types near Gauteng or other areas of South Africa. If left unchecked, there will be a drastic reduction in biodiversity and a large change in the amount of ecosystem services available. The changed condition would create a vastly different wildfire regime with enhanced frequency and intensity of fires.

Controlling invasive alien species has been attempted. Some biological introductions, mostly fungi and wasps, to limit the spread of invasive plants have met with some success. Being able to pinpoint the locality of high pressure areas is important when prioritizing projects. "Citizen Science" and school programs that train and use local community members to conduct monitoring and inventory occurrence are helpful to find species' distribution and also educates participants regarding environmental issues.

Working for Water is part of the South African Government's Expanded Public Works program and aims to create jobs while combating invasives. Attempting to remove invasives is a social investment contributing to the new national drive towards developing the green economy. The employees are typically those who could not be employed otherwise.

One aspect of the invasive alien organism issue that has not received much attention is the spread of pines and eucalypts from industrial forest lands. Seed from these trees migrate out of the plantations on the wind and often wash into nearby drainages. The drainages provide adequate substrate for germination and can eventually disrupt natural riparian function.

Alien terrestrial land animals have not been much of an invasive species issue, but marine species along the coast could be affected by crustaceans that arrive on ships. There is evidence this threat could be increasing as a greater number of ships are using South African maritime waters for fishing and coal exports.

Genetically altered organisms, particularly in the agriculture sector, has been a concern as one aspect of the larger invasive species issue. However, genetically altered organisms can be much better controlled because their existence is better regulated. A well designed and implemented monitoring program for genetically altered organisms should allow these plants and animals to not pose a higher threat to biodiversity than other traditional agricultural practices. However, at this time, a good monitoring system has not been developed.

2. Current and Historic Mining Activity. This is a rapidly increasing concern for biodiversity conservation, particularly in the grasslands biome. The amount of the expansion of coal mining activity

has been huge due to the need for meeting the expanding domestic demand for electricity and the increased export of coal to China. The government departments responsible for evaluating and approving the new mining requests (not just for coal) have been overwhelmed. Unfortunately, the applications for mining development are often located at or near some of the most valuable land for conserving biodiversity. There also appears to be a relationship between the areas recently requested for mining prospecting rights and the land claimed or earmarked for land reform. The applications are going through so fast, there may not be an opportunity to properly evaluate the impacts to biodiversity and other environmental factors. South African law for the regulations pertaining to the Departments of Mineral Resources and Energy was historically deemed to have a stronger right than the regulations pertaining to the Department of Environmental Affairs. This inadequacy has recently been recognized and some legislative attempts to improve the situation have been made. A very recent watershed ruling by both the appeal court and the constitutional court that mining rights have to be fully subjected to environmental assessments and regulations is an encouraging move in the right direction.

Groundwater contamination is occurring from toxic materials leaching from old mines. Much of this issue is in the Johannesburg area. Runoff from old mine waste is also contaminating agriculture and natural or protected areas. The threat to water quality from mineral exploration also includes the relatively new process of hydraulic fracturing or “fracking” for natural gas, most prominent in the Karoo region.

3. Climate Change. The majority of the climate change models predict South Africa will be warming at twice the rate of the global average, possibly having dire consequences as the climate is already relatively warm. Climate change is predicted to increase temperatures 2 to 3° C and could possibly displace high elevation plant species right off the top of the mountains. This change could also affect how the land is used, as some productive grasslands could revert to unproductive shrub lands. The precipitation models show mixed results of increasing and decreasing rainfall around the country; some isolated areas may have improved precipitation and agricultural conditions but the reverse is expected in most areas. The timing of precipitation may also be affected as the dry west may experience a switch from winter to summer rainfall.

Another threat from climate change is increased atmospheric levels of CO₂. The trend seems to be that increased CO₂ causes an increase in shrub and low tree cover; displacing the productive open grassland and Karoo biomes to bushlands/savanna/tree cover. This affects the hydrology and grazing carrying capacity of the land; and therefore livelihoods.

Climate change is the predominant threat to the indigenous forests of South Africa. Changes in temperature, precipitation, and CO₂ levels could change forest species distribution, composition, and structure. Changes in climate could also affect how trees and forests are able to react to perturbations. An increased vulnerability to wildland fire, insects, disease, and invasive species could result.

Climate change may have an effect on disease and health issues in South Africa. Cholera and malaria are environmentally controlled diseases (water borne) so climate change could allow for the incidence of these to become more prevalent farther south. This is not a very serious health threat in South Africa right now but it has the potential to become much more so with a changing climate. The South African Council on Science and Industrial Research (CSIR) has been working with the European Union in cholera prevention programs using a climate change context.

4. Inadequate Environmental Law Enforcement. There is an impressive amount of well-constructed environmental legislation on paper in South Africa, but inadequate enforcement of these regulations is a threat to biodiversity. The judicial system has been unable to consistently prosecute environmental crimes, particularly in regards to organized crime. The high profile poaching of rhinoceros horns and elephant tusks is a function of inadequate law enforcement. The regulatory framework exists to stop or

limit poaching but the political will in a country with high levels of unemployment is often missing. The enforcement of industrial, domestic, and agricultural pollution regulations has also been lacking.

Figure 13. White Rhinoceros.



The corruption of local law enforcement and political figures is also recognized as an issue, but there is hope this is changing with a young, maturing democracy. A positive sign that some progress is being made is the recent establishment of the Environmental Management Inspectorate. The inspectors are commonly known as the “Green Scorpions” (biodiversity and conservation enforcement issues) and the “Blue Scorpions” (marine and coastal enforcement issues). Most South Africans hold these programs in high regard.

Medicinal plants have been and continue to be a huge contributor to the medical practices of

South Africa. These plants are often found in and near formally protected areas. Increasing harvest rates are threatening the biodiversity of some regions. Many of the plants used by the traditional healers are threatened or endangered. There are about 1000 medicinal plants in South Africa and about 61 of these are threatened or endangered. Some of the harvesting of these plants is not sustainable and some are now being lost. The economic value of these plants is huge and the harvest has been increasing lately due to over-exploitation. The traditional healers are not the problem as they only take what they need locally. The problem is the inadequate enforcement of laws that limit the export market. This is having a devastating effect both in and around the national parks.

The inadequate enforcement of laws and agreements relating to the harvest of abalone and other marine organisms in coastal areas has recently become a significant concern. Again, South Africa has good laws and agreements in place but does not have the capacity for enforcement. This is beginning to have a large effect on the biodiversity of areas just off the coast as the numbers of commercially important marine organisms are being depleted. The amount of harvest by other countries off the coast is increasing but the funds available for monitoring and enforcement is the limiting factor in keeping harvests at sustainable levels. The major countries involved are China and Taiwan.

5. Medical Waste. Many of the agencies and organizations the assessment team interviewed cited the improper disposal of medical waste as a major threat to biodiversity. As donor organizations such as USAID increase their involvement with health programs, primarily related to HIV/AIDS, the amount of medical waste generated is increased. Much of the material is highly toxic and is simply being disposed of in landfills or as litter. Safe water supplies could be compromised, affecting both domestic use and freshwater and marine aquatic diversity. The capacity for adequate medical waste disposal could be lacking in the general health programs that USAID supports.

B. Minor or Emerging Threats

Minor or emerging threats were identified during the interviews as factors that are or will be affecting biodiversity conservation, but to a lesser degree than the major threats. Recommendations for USAID programs in the following section of this report are based on the major threats only, however knowledge of the status of these minor threats could be useful during strategic planning. The following subsection outlines several of the minor or emerging threats to biodiversity and forests in South Africa.

1. Agriculture and Commercial Plantation Forestry. The threat to biodiversity resulting from land conversion for farming and grazing has been a significant issue in the past. However, there has not been

much expansion of the agriculture sector recently and many of the practices now employed on the farms and pastures are friendlier to conservation. Many of the economic incentives to become a new farmer or invest in new agricultural land are no longer in place. Land reform issues and the stagnant population growth in South Africa have also reduced conversion of biologically diverse landscapes to agriculture. Most of the threat to biodiversity from agriculture results from prevalent poor farming and grazing practices, leading to degradation of the soil, increased erosion, and reduced water quality.

Plantation forestry for wood production is also not as much of a concern to biodiversity conservation than it once was. The plantation forestry sector is well organized and is much more cooperative for NGOs to work with than other sectors, such as mining. It is now a common practice for the forestry companies to avoid establishing plantations in or near sensitive areas, such as streams and wetlands. Natural biological passage corridors are being maintained and the less productive lands adjacent to the plantations are being well managed for biodiversity. After the plantations mature and are harvested, the land is usually quickly replanted to other pines or eucalypts. The logs are typically processed locally and most of the companies are based in South Africa, allowing for the South African Government and the local NGOs to have a good working relationship with the companies.

2. Urban Development. The threat to biodiversity from urban development has been somewhat lessened in the past decade due to slowing population growth as a result of human disease and emigration. This threat is now primarily related to the proximity of the development to riparian areas. This is true of the informal, semi-developed squatter settlements along the edges of streams as well as the resorts and estates established along the shores of lakes and reservoirs. Some land use planning in the larger cities is being implemented to make sure the settlements and resorts are located in less sensitive areas. Developments along the coast lines are also becoming more prevalent.

The broad, rural land use issue of squatter camps and informal communities developing in areas of high biodiversity away from large cities is also a threat. Much of this development is occurring adjacent to protected areas, like Kruger National Park, taking advantage of the tourism or other economic opportunities there. Land use allocation is delegated to the local municipal level and the communal tribal land is managed within the tribal governance system, but they have the least capacity to achieve conservation results.

3. Fuelwood Use. The depletion of trees and shrubs for cooking and warming fuel has been a threat to biodiversity for many decades. Woody plant conservation is becoming more difficult in the rural areas as a result of increased mortality from HIV/AIDS. Funerals are a major use of wood, mostly for the cooking of food and the preparation of the gravesite. The largest issues in the past have been in the riparian areas but there is also now pressure in the uplands. Degradation of wooded areas around the national parks is having a profound effect on the biodiversity of those areas. Trees around the park boundaries are now being depleted which puts more pressure on the adjacent areas in the parks to provide necessary ecosystem services.

4. Poor Governance. As with most large, complex countries, the South African national and local governments have many departments and agencies with responsibilities that have either direct or indirect effects on the environment and biodiversity. The various government agencies are not often talking or coordinating with each other when working in similar arenas and conservation efforts are either poorly implemented or actual environmental degradation is occurring. There are often several different government agencies working on their individual responsibilities on the same parcel of land. Government management needs to be much more integrated. There are too many departments with their own regulations and too many layers of responsibility between and within the national and provincial levels to make effective environmental conservation happen.

The recent land reform programs are a clear threat to biodiversity as a result of the lack of good decision making and the lack of support by the government after land reform has been implemented. The new

owners are often not prepared or equipped to manage their new land holdings. These lands are often becoming degraded and are not producing both the agricultural or ecosystem services as with previous ownerships. The mentoring programs that have the former owner operating the farm and instructing the new owners has been a successful program and needs to be expanded.

5. Too Much Emphasis on “[Charismatic Megafauna](#).” One issue with biodiversity conservation is that the rhinoceros and similar well known animals are dominating the conservation debate. Biodiversity is threatened when conservation resources are only directed at the most visible aspects of the landscape. The whole ecosystem needs to be part of the conversation and the rhino is only a small part of the larger process.

The over emphasis of large mammal conservation has another, somewhat controversial, aspect. Representatives from both agencies of the SAG and NGOs expressed that all harvesting of large, threatened animal species should not be stopped. Selected harvesting creates an incentive for private game farms to perform good management which can be paid for by hunting and/or animal part marketing. They felt the well-managed game farm can contribute hugely to biodiversity conservation. There is an impediment to implementing this concept largely from countries like the United States, who require a strict adherence to CITES.

6. Non-Petroleum Based Energy Development. Locating wind and solar power generating facilities in sensitive areas can be a threat to biodiversity. Even though this is a sound alternative to the negative effects of developing coal resources, there can be effects to wildlife, such as bird mortality, as well as converting lands of high vegetative biodiversity to areas of development underneath the turbine towers or solar panels. As the desire to have less dependence on petroleum is more important, biofuels may be looked at as an answer. Conversions of high biologically diverse land for biofuel agriculture would obviously reduce biodiversity.

7. Biodiversity Information Management. A threat to biodiversity is the lack of good data collection and appropriate data management techniques when trying to implement environmental programs. Decisions about natural resource management that are based on poor data may be worse than no decisions at all. There is a large inventory of attractive environmental maps in South Africa, but the actual data that created them might be suspect.

8. The Profile of Environmental Issues. The importance of environmental and biodiversity conservation issues within the SAG and the political process is not high enough. Economic objectives are always more important. The government of South Africa will try to improve the middle class, possibly at the cost of the environment. There is no overarching vision on how improving biodiversity conservation can actually improve the economic situation. The local administrator’s understanding of environmental issues needs to be emphasized to a much greater extent. Without this type of understanding, very little biodiversity conservation progress will be made.

V. RECOMMENDED ACTIONS FOR USAID PLANNING

This section summarizes ongoing USAID programs, describes the extent to which USAID programs meet the biodiversity conservation needs, and identifies general recommendations designed to address the major threats to biodiversity and forests.

A. Summary of Ongoing USAID/South Africa Programs

The USAID/South Africa portfolio currently includes programs in four sectors: Health, Economic Growth, Education, and Governing Justly and Democratically. In addition to the regional-level environment-related programs discussed in the “Background on USAID Activities” subsection in the Introduction to this report, current programming in other activities is briefly described as follows:

Health. South Africa is home to more HIV-positive people than any other country in the world. Under the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR), the USG provides direct support to 646,000 individuals on antiretroviral treatment for HIV at the service delivery level. USAID also builds management and technical capacity to address the epidemic. USAID works with the public sector, NGOs, the private sector, and faith-based partners to train and support health care workers and community based workers that are helping people with HIV/AIDS. The prevalence of HIV/AIDS has fueled a concurrent tuberculosis epidemic and a growing incidence of multi- and extensively drug-resistant tuberculosis. With support from USAID, the SAG provided tuberculosis treatment to more than 97,000 people co-infected with HIV in 2009. PEPFAR also works with the Department of Social Development and nongovernmental organizations to provide care for 486,000 orphans and vulnerable children. USAID’s contribution to health-related programs has been approximately \$300 million annually.

Economic Growth. South Africa’s economy suffers from significant wealth inequality, high unemployment, and lack of a skilled workforce among historically disadvantaged populations. Through the South African International Business Linkages Program (SAIBL) and the Financial Sector Program (FSP), USAID helps to enhance the competitiveness of historically disadvantaged small and medium size enterprises (SME) and contributes to improving access to financial services for SMEs. SAIBL works in the manufacturing, services, and agricultural sectors and promotes SMEs to build commercial trade ties among established businesses in South Africa and the world. This program has assisted over 3000 SMEs over the last 11 years.

As part of the Feed the Future (FTF) initiative, USAID is engaged with the South African Department of Agriculture as well as the South African Agri-Business Chamber to help develop agriculture and agribusiness in the region, provide market linkages to small holder farmers and leverage South Africa private sector investments into agriculture development for the region. USAID is also supporting South Africa’s technical and training capacity to strengthen agriculture leadership for regional countries to move the Comprehensive Africa Agriculture Development Program agenda forward.

In partnership with the Department for Higher Education, USAID is supporting 12 Further Education and Training (FET) colleges in Limpopo, Mpumalanga, and Northern Cape through strengthening student support services that prepare students for the workplace, encouraging career center linkages with the private sector, and building the leadership capacity of national and provincial FET staff.

South Africa plays a dominant role in the region’s energy sector as a major exporter of electricity to other Southern Africa Development Community (SADC) member countries. USAID’s Africa Infrastructure Program has promoted significant structural reformation such as support for establishing South Africa’s Independent System and Market Operator (ISMO) legislation and the roll-out of South Africa’s Renewable Energy-Independent Power Producer (RE-IPP) activity. ISMO and RE-IPP activities will result in meeting important renewable energy goals within South Africa by 2030.

Education. South Africa has succeeded in providing nearly universal access to basic education; however, the country still faces enormous challenges in improving the quality of education. Despite a significant investment in education, barely one in ten South African students qualify for university, and only 5% end up with a degree. The overall aim of the USAID Basic Education program is to improve primary grade reading outcomes by building teacher effectiveness and strengthening classroom and school management. This is being accomplished through support to innovative, local interventions that have a demonstrated capacity for scale-up. Most funding for non-basic education has been in regards to HIV/AIDS prevention.

Governing Justly and Democratically. USAID works with the SAG to address women's rights and access to justice under the Women's Justice and Empowerment Initiative. Specifically, USAID increases access to justice and integrated support services for rape and sexual assault survivors through expansion of and support to the Thuthuzela Care Centre network. With USAID's support, 40 rape crisis centers will be established by the end of 2012. This model is an inter-sectoral SAG program that works to ensure rape victims do not experience secondary trauma while seeking justice and medical treatment. Located in public hospital facilities, the Centers provide a range of essential services from emergency medical care, post-exposure prophylaxis, counseling, and court preparation in an integrated and victim-friendly manner. By establishing effective linkages between various government stakeholders, the Centers seek to effectively address the medical and psycho-social needs of sexual assault survivors, while improving conviction rates and reducing time to court.

USAID is winding down its community court program, which has improved management efficiency and significantly decreased case backlogs. As a final activity, USAID will support the formulation of a policy document and subsequent legislation that will promote the efficient governance of community courts.

Recent annual funding for democracy and governance programs has been approximately \$20 million.

B. Extent to Which Ongoing and Proposed Activities Meet Needs and Pose Threats

Mission activities in the health, economic growth, education, and governance sectors have directly and indirectly eased certain drivers of biodiversity loss and natural resource degradation. There is also the potential for some programs to increase the vulnerability of natural systems to loss of biodiversity.

The current regional environmental programs involving reducing greenhouse gas emissions and trans-boundary water resource management are positive steps to biodiversity conservation. The LEDS program has objectives to reduce air pollution and climate change impacts. Improved water management in the Limpopo and Orange River drainages would maintain water levels in riparian areas and reduce the amount of pollution entering these systems. The lessons learned, techniques developed and capacities built in this program can also benefit other South African river systems. There appear to be no risks to biodiversity from the USAID/Southern Africa environmental programs.

In the health sector, because people struggling with poor health and nutrition often resort to less sustainable livelihood practices and place a greater economic burden on society, USAID support for reducing the effects of HIV/AIDS and tuberculosis has reduced the impact of disease on people's management of natural resources. An unfortunate side-effect of an expanded health program is the biodiversity threat of the increased amount of medical waste.

The Economic Growth sector of USAID has the potential to most dramatically improve biodiversity conservation of all current USAID programs. Improved economic conditions applied to the entire extent of the South African population would reduce the desire for risky profits from the illegal harvest of threatened and endangered plants and animals, reduce the amount of informal urban development near riparian areas, reduce marginal and damaging agricultural practices in rural areas, increase the potential for polluting companies to afford cleaner operations, and improve government's capacity to collect and

dispose of waste and enforce environmental laws. An improved economy may result in government officials having less incentive to engage in corrupt activities. Threats to biodiversity conservation from economic growth activities include increases in agricultural production that may result in the opening of slopes, wetlands, and woodlands to farming; the depletion of water sources; erosion of soil; introduction of invasive species; and/or pollution of water through increased pesticide and fertilizer use. Improved economic conditions could also increase the need for energy, thus increasing the need for coal production and may increase the amount of resort and estate development near water bodies.

Basic education efforts could have a long-term positive effect on biodiversity conservation as a better educated population would be able to receive environmental messages more meaningfully. Hopefully, poor environmental practices by individuals could be improved through more effective education with a more literate society. There are no threats to biodiversity from the USAID education programs.

USAID's democracy and governance activities have primarily affected biodiversity conservation by reducing corruption and increasing the capacity for the judicial system to enforce environmental legislation. The Women's Justice and Empowerment Initiative may have a positive, but probably minor, effect on biodiversity if incidences of rape are reduced and the judicial system is able to devote more attention to enforcing environmental compliance. There appear to be no threats to biodiversity from the USAID democracy and governance programs.

C. Recommendations and Linkages within Existing and Proposed Activities

The assessment team has included six major recommendation themes designed to address threats to biodiversity and forests with a set of recommended actions for each. The recommendations outlined in this section have been identified using the following criteria: 1) potential to address or mitigate threats to biodiversity or enhance conservation of biodiversity, based, in part, on examples of success of the activity in other regions around the world and/or the existing need of support for South Africa to address the threat; 2) feasibility of implementation of the recommendation based on cost and the existence of similar government or NGO efforts in the region; and 3) the degree to which the recommendation may meet or is synergistic with improving USAID programs concerning the environment, local economic development, education, governance, and improving health conditions. The assessment team fully realizes these recommendations may be outside the scope of current and planned USAID activities in the country or region.

Recommendation Theme #1: Build Capacity for an Environmental Program to Reduce the Spread of Invasive Alien Organisms.

Invasive alien organisms could be the most substantial threat to conserving biodiversity in South Africa and was the one subject matter most consistently discussed at the assessment team's discussions with NGOs and government agencies. Interestingly, recommendations from representatives of these entities to address the spread of these organisms were lacking. The most common program discussed to address invasive species were the Expanded Public Works programs Working for Energy, Working on Fire, Working for Wetlands, and Working for Water. These programs have offered concrete results in reducing the incidence of invasive species while providing employment for underprivileged people, but due to short budget timelines, lacks sustainability.

- *Recommendation:* Assist the South African Government with their Expanded Public Works programs.

Recommendation Theme #2: Build Capacity for Better Governance.

In order to address inadequate law enforcement and government corruption regarding environmental issues, the capacity for better governance needs to be improved. One step towards this is improving the environmental awareness of newly elected or appointed politicians in biodiversity conservation

and environmental topics. Building this capacity at all levels of government is needed. There is a vast difference between the provinces in natural resource management capacity and expertise. The skill set of the government's environmental officials and managers needs to be greatly increased, especially at the provincial government and local municipal levels.

The leadership in the rural communities is often struggling between a western style of government and the tribal traditions. The traditional leaders typically need to approve any projects before they can move forward. Chiefs need to be involved by sitting on the boards and other organizational structures. The traditional tribal structures have jurisdiction over allocation of land use rights to its affiliated tribal members; mostly with no regard to ecological capacity of the land. The tribal infrastructure and capacity for implementing projects is not well developed in most communities. A substantial percentage of South Africa is still communal property governed in the traditional way.

- *Recommendation:* Develop an educational training program for locally elected officials or tribal chiefs to improve understanding of environmental issues and biodiversity conservation.
- *Recommendation:* Local municipalities and rural tribal authorities have some jurisdiction for land use allocations. Initiate a governance project to investigate how to strengthen capacities within these authorities.

Recommendation Theme #3: Environmental Education at the Elementary School Level.

Environmental education in the public schools is inadequate. Education early at the elementary level is critical for creating life-long awareness of environmental issues. Teachers are often unqualified and always underpaid. The education programs need to improve the quality of the teachers and include environmental education in the curriculum. Another aspect of early environmental education is natural resource managers have recognized a lack of interest for young, educated professionals to become the new conservation leaders in South Africa. Current managers need to identify candidates in the schools that can be mentored and fast tracked to these positions.

- *Recommendation:* Develop and provide an environmental education curriculum. Emphasize the impacts that invasive alien organisms are having on biodiversity. Improving awareness at a young age could result in a lifetime of conservation. Children often influence the behavior of parents as well. The "Eco-Schools" Initiative currently being implemented by WESSA is a successful program that could be enhanced.

Recommendation Theme #4: Improve Biodiversity Conservation Practices within the Human Health Programs.

Improved living conditions from a healthier environment can result in better human health. Improperly disposed medical waste is both a threat to human health and can pose a danger to plants and animals in the landscape. Better living conditions can be achieved through disaster mitigation, alternative livelihoods, flood mitigation, and improved water quality; in turn resulting in increased biodiversity conservation as less pressure is placed on the flora and fauna for survival.

- *Recommendation:* Improve medical waste disposal education and practices.
- *Recommendation:* Improve water quality and disaster mitigation programs as well as encourage alternative livelihoods for improved individual well-being. Improved health and living conditions could result in increased biodiversity conservation.

Recommendation Theme #5: Build Capacity for South Africa to Mitigate Impacts of Global Climate Change.

Mitigating the effects of climate change can be achieved by reducing South Africa's contribution to global carbon emissions. The Low Emissions Development Strategies (LEDS) program at USAID is a positive step for reducing greenhouse gases from South African industries. A clean stove initiative would help with reduced fuel wood use, improve indoor air quality and related health issues, and reduce greenhouse gasses. Stove initiatives have often failed in the past due to poor project design and not involving the users. Renewable wind and solar energy development, which South Africa has an abundance, would reduce the country's reliance on coal. Renewable energy, if properly located, would improve air quality, water quality, and conserve areas of high biodiversity importance.

- *Recommendation:* A well designed clean stove initiative could reduce fuel wood use and improve indoor air quality and related health issues and reduce greenhouse gasses.
- *Recommendation:* Expand the Low Emissions Development Strategies (LEDS) program.
- *Recommendation:* Encourage the use of renewable energy sources and reduce the reliance on coal.

Recommendation Theme #6: Assist South Africa in the Development of National and Provincial-Level Action Plans for Adaptation to Global Climate Change.

Adapting to a changing climate can be achieved by decreasing the vulnerability of South Africa to the impacts of global climate change. Many of the representatives of NGOs and government agencies indicated lack of coordination between themselves and each other is hindering conservation efforts, particularly with new and poorly understood issues like climate change. Information management at the Department of Environmental Affairs and across all the environmental agencies in South Africa is suffering from a lack of proper spatial data quality and management that is hindering climate change coordination.

SANBI has been developing a multi-country seed bank of less common plants to have material available if some rapidly increasing perturbation, such as disease, removes most of the population of a particular plant. The incidence of these perturbations could be accelerated by climate change.

- *Recommendation:* Encourage collaboration among NGOs and government agencies on climate change adaptation to share information and reduce redundancy and contradiction.
- *Recommendation:* Assist NGOs and government agencies with spatial data collection and management approaches.
- *Recommendation:* Assist the South African National Biodiversity Institute with their efforts at establishing a seed bank.

VI. CONCLUSIONS

With its incredible biological diversity, high rates of endemism, and vulnerability to climate change, efforts to effectively conserve and sustainably manage natural resources in South Africa are critical. Further, with extensive rural populations dependent upon natural resources and ecological services for sustaining daily basic livelihood commodities, viable agriculture, livestock production, medicinal plants, and fuelwood, USAID should ensure its programs and activities prioritize the sustainable management and conservation of biodiversity and indigenous forests.

Exceptional opportunities exist for USAID to incorporate environmental activities into its existing portfolio of objectives and programs. These opportunities may also prove synergistic in the achievement of USAID objectives and addressing major threats to biodiversity and forests. For example, USAID could support incorporating environmental education programs at the elementary school level and the South African Expanded Public Works programs, such as Working for Water, in the General Development Technical Office. USAID should also consider enhancing watershed and land management activities into national-level and trans-boundary activities to enhance water quality, mitigate erosion and siltation, and maintain important natural filtration systems. Other activities USAID could consider within the scope of the existing portfolio of programs and activities include: incorporate a medical waste disposal program in Agency funded health programs, implement a clean cooking stove initiative, expand the LEDS program, encourage renewable energy sources, and incorporate into existing Democracy and Governance programs environmental training for officials at all levels of government.

USAID should also consider engaging USG technical agencies in addressing the multitude of threats to biodiversity and forests. A particularly high priority issue for possible USAID engagement with other USG agencies is global climate change. USG agencies are faced with similar challenges in monitoring and adapting to the impacts of climate change. Specifically, USAID could partner with US Geological Survey and the US Forest Service to enhance the capacity of South African institutions to monitor the impact of climate change on water and natural resources. Further, USAID should consider engaging the National Park Service, the US Fish and Wildlife Service, and the US Forest Service to assist South Africa in planning for national or regional level response and adaptation of natural resource management to global climate change.

USAID has made substantial efforts to advance their objectives of economic growth, education, human health, and governance. For these efforts to reach their long-term objectives, critical threats to natural resources and biodiversity must be addressed and the sustainable management of natural resources prioritized.

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APPENDICES

Appendix A - LIST OF INDIVIDUALS INTERVIEWED

The following list displays the individuals and organizations consulted for preparation of this report during the January 13 to February 3, 2012 visit to South Africa by the U.S. Forest Service team.

Organization and Location	Individual(s) Interviewed
ENVIRONMENTAL NGOs	
African Wildlife Foundation, Washington, D.C.	Jimmie Mandima, <i>Program Director of Policy</i> ; David Williams, <i>Program Director Conservation Geography</i>
African Wildlife Foundation, White River, South Africa (via Skype)	Harry van der Linde, <i>Senior Director for Programme Design</i>
Conservation International, Arlington, Virginia	Heljye Moumkala, <i>Development Director for Africa and Madagascar</i> ; Frank Hawkins, <i>Senior Vice President for Africa and Madagascar</i>
Conservation South Africa, Cape Town, South Africa	Sarshen Marais, <i>Director, Policy and Markets</i>
Flora and Fauna International, Washington, D.C.	Adam Henson, <i>Technical Director</i>
Institute of Natural Resources, Pietermaritzburg, South Africa	Fonda Lewis, <i>Chief Scientist, Masters Environment & Development</i>
Peace Parks Foundation, Stellenbosch, South Africa	Craig Beech, <i>Information System Manager</i> ; Catherine Traynor, <i>Ecosystem Advisor to Programmes</i>
Resource Africa, Pretoria, South Africa	Kule Chitepo, <i>Executive Director</i> ; Julian Sturgeon, <i>Board Member and Climate Change Consultant</i> ; Hector Magome, <i>Board Member and Director of Conservation for SANParks</i>
Wildlife and Environment Society of South Africa (WESSA), Johannesburg, South Africa	Garth Barnes, <i>National Conservation Director</i>
World Wildlife Fund, Cape Town, South Africa	Deon Nel, <i>Head of Biodiversity</i>
AGENCIES, COMMISSIONS, & MINISTRIES	
Council for Scientific and Industrial Research, Government of the Republic of South Africa, Pretoria, South Africa	Jimmy Adegoke, <i>Executive Director, Natural Resources and the Environment</i> ; Bob Scholes, <i>Systems Ecologist</i> ; Luthando Dziba, <i>Principal Researcher</i> ; Jonathan Diederiks, <i>National Programme Coordinator, SASSCAL</i> ; Belinda Reyers, <i>Research Group Leader: Biodiversity and Ecosystem Services</i>

Organization and Location	Individual(s) Interviewed
Department of Environmental Affairs, Government of the Republic of South Africa, Pretoria, South Africa	Wadzi Mandivenyi, <i>Director: Biodiversity Risk Management</i> ; Kallie Naudé, <i>Biodiversity Control Office, Protected Areas Planning</i> ; Edward Netshithohle, <i>Deputy Director, International Relations</i> ; Vhalinavho Kharhagali, <i>Deputy Director, Biodiversity Risk Management</i>
Department of Water Affairs, Government of the Republic of South Africa, Hartbeespoort, South Africa	Petrus Venter, <i>Programme Leader and Coordinator</i> ; Zoran Cukic, <i>Program Manager, Investigation and Removal of Sediment</i>
South African National Biodiversity Institute (SANBI), Government of the Republic of South Africa, Cape Town, South Africa	Guy Midgley, <i>Chief Director, Climate Change & BioAdaptation</i> ; Heather Terrapon, <i>National Biodiversity Monitoring Coordination</i> ; John Donaldson, <i>Chief Director, Applied Biodiversity Research Division</i>
South African National Biodiversity Institute (SANBI), Government of the Republic of South Africa, Pretoria, South Africa	Carmel Mbizvo, <i>Head Biodiversity Research & Knowledge Management</i> ; Chris Willis, <i>Chief Director, Conservation Gardens & Tourism Division</i> ; Anthea Stephens, <i>Programme Manager: Grasslands</i> ; Vivian Malema, <i>Director, Biodiversity Education and Empowerment</i>
South African National Parks (SANParks), Government of the Republic of South Africa, Cape Town, South Africa	Melodie McGeoch, <i>General Manager</i> ; Nicola van Wilgen, <i>Global Change Scientist</i>
South African National Parks (SANParks), Government of the Republic of South Africa, Skukuza, South Africa	Harry Biggs, <i>Programme Manager: Adaptive Biodiversity Outcomes</i> ; Danie Pienaar, <i>Head of Department: Scientific Services</i>
USAID MISSIONS / US EMBASSIES	
US Department of State, Pretoria, South Africa	John Griffith, <i>Environmental, Science, and Technology Officer</i>
USDA Food and Agriculture Service, Pretoria, South Africa	Corey Pickelsimer, <i>Senior Agricultural Attaché</i>
USAID, Pretoria, South Africa	Leslie Marbury, <i>Deputy Director, Regional Economic Growth Office</i> ; Blake Chrystal, <i>Director, Regional General Development Office</i> ; Monica Moore, <i>Democracy and Governance Team Leader</i> ; Doreen Robinson, <i>Environment Team Leader</i> ; David Chalmers, <i>Natural Resource Officer</i> ; Camilien Saint-Cyr, <i>Senior Regional Environmental Advisor</i> ; Lauren Marks, <i>Health Program and Public Private Partnership Advisor</i> ; Erik Pacific, <i>Environment Team</i>

Organization and Location	Individual(s) Interviewed
	<i>Deputy Program Officer</i>
USAID, Washington, D.C.	Tim Resch, <i>Environmental Advisor for Africa</i> ; Walter Knausenberger, <i>Senior Environmental Policy Advisor for Africa</i> ; Alex Apotsos, <i>Environmental Advisor for Africa</i>

Appendix B - SITE VISITS

The following list site visits conducted for preparation of this report during the January 13 to February 3, 2012 visit to South Africa by the U.S. Forest Service team.

Site Visit and Location	Reason for Site Visit	Date(s) Visited
Hartbeespoort Dam , Kosmos, North West Province	Review Dam (Reservoir) Remediation Program designed to improve water quality.	January 19, 2012
Pilanesberg National Park, North West Province	Review biodiversity status and protected area management.	January 21, 2012
Austin Roberts' Bird Sanctuary, Pretoria	Review biodiversity status and protected area management.	January 25, 2012
Kirstenbosch Botanical Gardens, Cape Town	Review biodiversity status, natural forest status, and protected area management.	January 30 & 31, 2012
Robben Island World Heritage Site, Cape Town	Review for context of South African history and government.	January 31, 2012
Table Mountain National Park & World Heritage Site, Cape Town	Review biodiversity status and protected area management.	February 1, 2012

Appendix C - DETAILS OF NON-GOVERNMENT AND DONOR ORGANIZATIONS

Non-Governmental Organizations (NGO) Support

A large variety of Non-Governmental Organizations are working in areas of the environment and natural-resource management in South Africa. The following describes the NGOs operating in South Africa.

Institute of Natural Resources (INR). The Institute of Natural Resources, based in Pietermaritzburg, promotes the wise use and management of natural resources for the good of the environment and society. The INR has 27 years of experience. They aim to make a contribution to the wise use of natural resources, sustainable livelihoods, and poverty alleviation. The INR primarily provides support in the fields of water resources, biodiversity, and environmental change and vulnerability.

One of INR's emerging projects is "Climate Change Adaptation in the Lesotho Highlands." The project is to assess how climate change could affect the water output to South Africa from the Lesotho Highlands Water Project (described earlier in this report) and how to mitigate for any possible changes.

Wildlife and Environment Society of South Africa (WESSA). The Wildlife and Environment Society of South Africa was founded in 1926 and is one of South Africa's largest environmental NGOs. WESSA's vision is to ensure long-term environmental sustainability by promoting public participation. It is headquartered in Johannesburg.

WESSA's projects include facilitating education programs both within the traditional schools and for local government officials. The school program is based on the "Eco-Schools" program developed by the Foundation for Environmental Education headquartered in Denmark. Over 1100 Eco-Schools are certified in South Africa. WESSA, as an accredited training institution, has been working with government to train officials from local municipalities in building capacity for good governance. WESSA has also been working with the Eskom electricity utility for more than 20 years to move away from coal towards greener energy. A structure has been set up for small alternative energy providers to be compensated for putting electricity back on the grid.

Food & Trees for Africa (FTFA). Food & Trees for Africa (FTFA) is a South African social enterprise located in Johannesburg. FTFA addresses sustainable development through climate change action, food security, and greening, with a strong focus on environmental and global warming education and awareness.

FTFA has planted more than 4 million trees in the past 21 years. As early as 1990, FTFA realized that tree planting could assist in climate change mitigation and thus commenced the Trees for All Programme. Since then, FTFA continually receives thousands of applications for trees from poor communities living in barren, dusty townships across South Africa. FTFA provides one meter tall indigenous or fruit trees with assistance from sponsors. A Bamboo for Africa program has recently been initiated, and is now accredited as a Verified Emission Reduction program.

Wildlands Conservation Trust (WCT). Established in 2004 through the merger of two regional trusts, WCT is based near Pietermaritzburg. WCT's work is structured around a holistic approach to creating sustainable communities. Projects include the nurturing the development of green entrepreneurial businesses, restoration through waste recycling and cleaning of partner communities, conserving rare and threatened species, and facilitating the development of eco-tourism. One notable WCT project is their development of a cash-less rewards program for individuals in communities that propagate indigenous tree seedlings. The seedlings are traded for credits that can be used to acquire necessary household items.

African Wildlife Foundation (AWF). The 50 year-old AWF is an international conservation organization focused solely on Africa. AWF approaches wildlife conservation by identifying the most critical landscapes to preserve, areas called "Heartlands," that are large enough to sustain a diversity of species

into the future. Nine Heartlands have been established within Africa, with the trans-boundary Limpopo Heartland in the Kruger National Park area being South Africa's representative in their network. Within these landscapes, AWF implements a variety of efforts that conserve land and protect species. Their efforts focus on training and educating conservation professionals and developing conservation enterprises, such as safari lodges, to improve peoples' livelihoods while also conserving wildlife.

Two more conceptual Heartlands have been envisioned for South Africa: an area between Motlatse Canyon National Park and Manyeleti National Wildlife Refuge (west of Kruger National Park), and Zululand, which is adjacent to Swaziland and Mozambique. Designation of these areas as formal Heartlands and conservation efforts by AWF will begin when funding becomes available.

Conservation South Africa (CSA) and Conservation International (CI). Conservation International (CI) operates worldwide on protecting and maintaining the health of species, habitats, and ecosystems. They focus both marine and land-based efforts on securing a stable global climate, protecting fresh water, providing food for human needs, minimizing environmental pressures on human health, valuing human cultures, and safeguarding biodiversity. They enhance local government conservation activities by advising on areas such as agriculture land practices and tourism.

Conservation South Africa (CSA) is a locally registered NGO, but the local board of directors also consists of members from CI. The emphasis of CSA is to work in the three South African biodiversity hotspots (see "A2. Areas of Special Biodiversity Significance" in Section III). CSA's vision is to have the hotspots restored and maintained by developing water, food, and climate change resilience for the long term benefit of people and the environment. Many of CSA's projects are accomplished through the SAG's public works programs such as Working for Water and Working on Fire.

Fauna & Flora International (FFI). Fauna & Flora International (FFI), formerly the Fauna and Flora Preservation Society, is an international conservation charity. FFI was originally founded in 1903 and had worked in tandem with landowners, government, and sport hunters to help pass legislation which controlled hunting in vast stretches of Eastern and Southern Africa. FFI has members in over 80 countries.

FFI's work in South Africa is focused on the Cape Floral Kingdom. They are developing and applying tools that will help local partners increase the area of land under effective conservation management. These tools range from land purchase or legal designation, to packages of incentives derived from the sustainable use of biodiversity. FFI also supports the work of Resource Africa.

Resource Africa. Resource Africa operates in eight Southern Africa countries with headquarters in Pretoria. They employ collaborative management approaches at the community level to the conservation and sustainable use of natural resources in Africa. Resource Africa works with various partners to encourage resource management based on community participation. These rural community members often depend on natural resources for their livelihoods. Much of their work is with communities just outside the boundaries of protected areas. Resource Africa tries to use innovative approaches to raising awareness, like using theater presentations. They hope to be a bridge between the two worlds of western science and indigenous knowledge, with each learning from the other. An emphasis area is working with communities to develop the learning process for climate change adaptation.

World Wildlife Fund (WWF). The World Wildlife Fund is one of the largest international conservation organizations, with close to five million members worldwide. Their overall mission is to conserve nature and reduce the most pressing threats to the diversity of life on Earth. WWF has been in South Africa since 1968 and is locally headquartered in Cape Town. The local objectives for biodiversity work are to integrate ecological services into development planning, putting together the supply chains for companies to put back into programs that conserve biodiversity, and build changing climate resilience into the future. An example is a Water Balance Program that has a review, reduce, and replenish approach. Companies

are evaluated on their water use with an aim to reduce their consumption and to do something to replenish the natural systems.

Peace Parks Foundation (PPF). The Peace Park Foundation was created in 1998 to facilitate establishing trans-boundary protected areas in Southern Africa countries. These connected areas are called Trans-Frontier Conservation Areas (TFCA) or “Peace Parks.” Each of the TFCAs are legally established via signed treaties or memorandums of understanding between the countries involved. There are six TFCAs in South Africa and one (the Lubombo TFCA) goes three miles off-shore. PPF activities are centered within the established TFCAs. Examples include accounting for accomplishment in the Reducing Emissions from Deforestation and Degradation (REDD) program and conducting Ecosystem Service Mapping in an effort to standardize the natural resource information within a TFCA to show what might be available for economic outputs. REDD currently is not implemented in South Africa due to the program’s emphasis on tropical forests, but there may be potential for dry forest types, such as the wooded savanna, to be included in the future.

Endangered Wildlife Trust (EWT). Established in 1973 in Johannesburg, the Endangered Wildlife Trust operates in Southern Africa. Programs focus on applied fieldwork, research, and direct engagement with stakeholders. Their work supports the conservation of species and ecosystems by identifying the key factors threatening biodiversity, and recognizes the role that communities play in successful conservation programs. EWT’s current projects in South Africa include African crane conservation, aircraft bird strike avoidance, birds of prey conservation, cheetah and African wild dog conservation, riverine rabbit conservation, threatened grassland species conservation, and human-wildlife conflict mitigation.

Donor Organizations

The following describes the major foreign donor organizations involved in natural resource conservation operating in South Africa.

World Bank. The World Bank is an international financial institution headquartered in Washington, DC that provides leveraged loans to developing countries for capital programs. The World Bank has a stated goal of reducing poverty.

The World Bank has been active in South Africa since 1951. Their projects help address a wide variety of environmental conservation issues from wetland park conservation to improving biomass stoves. They are the largest donor organization operating in South Africa with over four billion US dollars currently or soon to be invested. Their largest projects include support to the energy sector, including a renewable energy support program valued at \$250 million.

Development Bank of Southern Africa (DBSA). The Development Bank of Southern Africa has a stated purpose to accelerate sustainable socio-economic development by funding physical, social, and economic infrastructure. DBSA’s goal is to improve the quality of life of the people of the region. DBSA supports a Sustainable Communities Programme that strives for a positive environmental impact. Projects funded by DBSA include climate change adaptation and improving South Africa’s water use.

German Agency for International Cooperation (GIZ). Formally known as the German Agency for Technical Cooperation (GTZ), GIZ is a private international enterprise founded in 1975 and owned by the German Federal Government, specializing in technical cooperation for sustainable development with worldwide operations. It primarily works for public sector organizations. GIZ began operating in Pretoria in 1996 and currently has priorities in South Africa in the areas of governance and administration, energy and climate, and HIV/AIDS.

United Nations Development Programme (UNDP). The United Nations Development Programme is the United Nation’s global development network with operations in 166 countries. It advocates for change and connects countries to knowledge, experience, and resources to help people build a better life.

UNDP currently has projects in South Africa that total about two to three million US dollars annually. UNDP's current environmental program, funded at about \$2.5 million over two years, is called *Greening South Africa's Economy*. The purpose of the program is to explore the transformative potential of a green economy by addressing structural imbalances that cause high and persistent unemployment, build capacity for action on climate change, scale-up renewable energy solutions, and harness biodiversity resources to create economic opportunities.

United Nations Environment Programme (UNEP). The core objective of the United Nations Environment Programme is to serve as an advocate for the global environment, to help governments set the global environmental agenda, and to promote sustainable development within the United Nations system. UNEP implements its strategy across six areas: climate change; disasters and conflicts; ecosystem management; environmental governance; harmful substances and hazardous waste; resource efficiency, and sustainable consumption and production.

Current and recent programs funded by UNEP in South Africa include:²¹

- providing seed financing to wind farm developments along the Eastern Cape,
- engaging 12 countries participating in the FIFA World Cup 2010 in a carbon offset initiative to make the trips of their national teams to South Africa climate neutral,
- the Africa Carbon Asset Development (ACAD) facility supported development of clean energy initiatives, including the International Ferro-Metals Co-generation Project in South Africa,
- roadmaps for solar and wind energy were prepared for South Africa, and
- national level support provided in introduction of eco-labeling schemes related to textiles and electronic goods in South Africa.

Global Environment Facility (GEF). An independent financial organization, the GEF provides grants to developing countries and countries with economies in transition for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants (POPs). Established in 1991, the GEF is today the largest funder of projects to improve the global environment.

The GEF is currently funding or has funded 27 projects in South Africa in the focus areas of biodiversity, climate change, and POPs. These projects total approximately \$93 million of GEF funds; many of the projects were implemented with matching or contributed funds from other sources. These projects are funded through agencies such as the UNDP and UNEP. A [list](#) of the current projects is available on the internet.

²¹ <http://www.unep.org/annualreport/2010/pdfs/UNEP-AR-2010-FULL-REPORT.pdf>

Appendix D - BIODIVERSITY CONCEPTS

The Convention on Biological Diversity (CBD) defines biodiversity as “*the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.*” It is the variety of life on earth at all levels, from genes to worldwide populations of the same species; from communities of species sharing the same small area of habitat to worldwide ecosystems.

Levels of biodiversity. Countries that have signed and ratified the CBD must implement policies to protect biodiversity at different levels, in particular:

- *Ecosystems* containing rich biodiversity, large numbers of threatened or endemic species, that are important for migrating species; have social, economic, cultural or scientific significance, or support key processes.
- *Species* and communities of species that are threatened, related to domesticated or cultivated species, have medicinal, agricultural, or other economic, social, cultural or scientific significance, and indicator species.
- *Genotypes* with social, scientific or economic significance.

To provide an understanding of how biodiversity is likely to respond to a proposed activity, impacts at each level of diversity can be best assessed in terms of:

- *Composition:* what biological units are present and how abundant they are.
- *Structure (or pattern):* how biological units are organized in time and space.
- *Function:* the role different biological units play in maintaining natural processes and dynamics.

The significance of these responses depends critically on uses and values of biodiversity.

Why is biodiversity important?

Why does this concern us? Besides having an intrinsic value as part of creation, biodiversity is the basis for a stable ecosystem which provides us with fundamental “ecosystem services:” fresh air, water, new soil, recreation. For the survival of humanity these services are crucial and therefore biodiversity needs to be protected. Also, biodiversity represents a huge pool of genetic capital which might become valuable in the future. Evidence is growing that these services are under great pressure due to human-induced climate change and the over exploitation of natural resources.

Perhaps most important of all, biodiversity is the basis for evolution and adaptation to changing environments, making it essential for the survival of life. Biodiversity values are often underestimated. They include:

- *Economic values:* biodiversity goods and products are sold for income or used as inputs to other economic activities, e.g., ecotourism. Replacement or substitution of the services provided by biodiversity (e.g., engineered flood defense to replace coastal protection by dunes or mangroves) often requires large financial investment.
- *Social values:* employment, health, quality of life, social security, and appreciation.
- *Intrinsic values:* in many cultures and societies, all or some components of biodiversity have “intrinsic” value in their own right, irrespective of any material contribution to human wellbeing.

Wherever this is the case, these values should be incorporated in socio-political decision making and should also be reflected in the environmental assessment process.

Biodiversity assessments require an explicit geographical scale and reference situation as well as appropriate units of measurement (species, habitats, ecosystems). The relation between local species richness and biodiversity value is not straightforward. Habitats or ecosystems may be naturally species-poor, but nevertheless contribute substantially to overall biodiversity at a higher level.

In the absence of quantitative data for habitats and ecosystems, most biodiversity assessments build mainly on species. Red lists of endangered species are a tool for assessing biodiversity trends. Common species in the wider countryside, however, are also covered to obtain a general indication of the sustainability of land use. Case studies can be used to highlight particular issues, especially in biodiversity hot spots.

Economic Importance of Biological Resources²²

Biodiversity is a valuable asset, but for the most part its use occurs outside of normal marketplaces, and therefore quantifying its value and the financial cost of its degradation and disappearance is difficult. The absence of functioning markets for biodiversity goods and services is a contributing factor to its degradation, particularly when the lack of payment for these leads to unsustainable use. Markets for biodiversity products and services such as hunting and ecotourism have existed for a long time and have been well quantified. Moreover, there are efforts under way to create markets or at least further develop existing markets through goods such as genetic material and instruments such as “green” funds (stocks and bonds), which are investment funds that specialize in companies that incorporate environmental sustainability into their business strategies.

Economists look at the value of biodiversity from several perspectives. The direct values of biodiversity are those that are implicit in consumers’ enjoyment of or satisfaction from biodiversity. Direct consumptive values are placed on biodiversity that is used without passing through a market, e.g., fishing or hunting. Usually, the consumptive value is determined by establishing the value of the whole experience, but sometimes its value is estimated on the basis of the market value if the commodity were actually sold. Direct productive values are placed on biodiversity that is commercially harvested, and they are derived from the actual value at the source (rather than at the market).

In contrast, indirect values of biodiversity are those that are derived primarily from the functions of ecosystems. Indirect non-consumptive use values are determined on the basis of the value of nature’s functions or services. Nature-based tourism, for example, depends on biodiversity and can generate substantial economic value, but it does not depend directly on the consumption of the biodiversity.

The maintenance of watersheds also generates significant economic benefits. In contrast, option value is based on the uncertain future – the value of maintaining biodiversity simply to ensure that future generations have the option to use it. Finally, existence value is the value that people attach to an asset simply because it is there rather than because anyone plans on using it. These values are almost impossible to measure but can partly be gauged, for example, by the large numbers of people willing to donate to nature conservation organizations.

In practice, the assessment of these values for particular ecosystems or protected areas is extremely difficult, partly due to methodological challenges such as distinguishing productive, consumptive, and non-consumptive uses; assessing option or existence values; and apportioning values that accrue because of biodiversity conservation versus values that accrue for other reasons. For instance, while biodiversity

²² World Bank. 2003. Biodiversity Strategy for the Europe and Central Asia Region. The World Bank, Washington, DC.

conservation may result in watershed catchment protection, or vice versa, bringing about substantial non-consumptive benefits, it is possible that the watershed catchment could be protected through other, perhaps less costly mechanisms as well. The policy question that economic valuation can help us address is “what costs will the economy have to bear if biodiversity is not conserved?”

Appendix E - LIST OF SOUTH AFRICAN PROTECTED AREAS

The significant designated protected areas in South Africa include Peace Parks, World Heritage Sites, Biosphere Reserves, National Parks, Marine Protected Areas, Wetlands of International Importance, and Provincial Protected Areas.

South Africa has the following existing **Peace Parks** which are established through treaties with neighboring countries²³:

- Ais-Richtersveld
- Kgalagadi
- Greater Mapungubwe
- Maloti-Drakensberg
- Great Limpopo
- Lubombo

South Africa has the following eight recognized **World Heritage Sites** as part of its efforts to identify and conserve that heritage²⁴:

- Cultural
 - Fossil Hominid Sites of Sterkfontein, Swartkrans, Kromdraai, and Environs (1999)
 - Mapungubwe Cultural Landscape (2003)
 - Robben Island (1999)
 - Richtersveld Cultural and Botanical Landscape (2007)
- Mixed
 - uKhahlamba / Drakensberg Park (2000)
- Natural
 - Cape Floral Region Protected Areas (2004)
 - iSimangaliso Wetland Park (1999)
 - Vredefort Dome (2005)

South Africa has the following registered **Biosphere Reserves** through UNESCO:

- Cape West-Coast

²³ <http://www.peaceparks.org/>

²⁴ <http://whc.unesco.org/>

- Kogelberg Biosphere Reserve
- Waterberg Biosphere Reserve
- Kruger to Canyons Biosphere Reserve
- Cape Winelands Biosphere Reserve
- Vhembe Biosphere Reserve

The South African National Parks (SANParks) manages the following nineteen **National Parks** across the country:

- Addo Elephant National Park
- Agulhas National Park
- Augrabies Falls National Park
- Bontebok National Park
- Camdeboo National Park
- Garden Route (Tsitsikamma, Knysna, Wilderness) National Park
- Golden Gate Highlands National Park
- Karoo National Park
- Kgalagadi Transfrontier Park
- Kruger National Park
- Mapungubwe National Park
- Marakele National Park
- Mokala National Park
- Mountain Zebra National Park
- Namaqua National Park
- Table Mountain National Park
- Tankwa Karoo National Park
- West Coast National Park
- Ai-Ais/Richtersveld Transfrontier Park

South Africa has the following **Marine Protected Areas (MPAs)**²⁵:

- Aliwal Shoal MPA
- Betty's Bay MPA

²⁵ [http://www.wwf.org.za/what we do/marine/mpas/our mpa s/](http://www.wwf.org.za/what_we_do/marine/mpas/our_mpa_s/)

- Bird Island MPA
- De Hoop MPA
- Dwesa-Cwebe MPA
- Goukamma MPA
- Helderberg MPA
- Hluleka MPA
- Langebaan Lagoon, Sixteen Mile Beach, Malgas Island, Marcus Islands, Jutten Island MPAs
- Pondoland MPA
- Robberg MPA
- Sardinia Bay MPA
- Stilbaai MPA
- Table Mountain MPA
- Trafalgar MPA
- Tsitsikamma MPA
- iSimangaliso MPA

South Africa presently has 20 sites designated as **Wetlands of International Importance** that meet the tenants of the Ramsar Convention, with a total surface area of 553,178 hectares. These include:

- Barberspan
- Blesbokspruit
- De Hoop Vlei
- De Mond (Heuningnes Estuary)
- Kosi Bay
- Lake Sibaya
- Langebaan
- Makuleke Wetlands
- Natal Drakensberg Park
- Ndumo Game Reserve
- Ntsikeni Nature Reserve
- Nylsvley Nature Reserve
- Orange River Mouth

- Prince Edward Islands
- St. Lucia System
- Seekoeivlei Nature Reserve
- Turtle Beaches/Coral Reefs of Tongaland
- Verloren Valei Nature Reserve
- Verlorenvlei
- Wilderness Lakes

South Africa has numerous **Provincial Protected Areas** that are administered by the various provinces. The most notable of these include:

- Baviaanskloof Nature Reserve (Eastern Cape)
- Great Fish River Nature Reserve (Eastern Cape)
- Gariep Dam Nature Reserve (Free State)
- Willem Pretorius Game Reserve (Free State)
- Cradle of Humankind World heritage Site (Gauteng)
- Suikerbosrand Nature Reserve (Gauteng)
- Greater_St_Lucia_Wetland_Park (KwaZulu-Natal)
- Hluhluwe - Umfolozi Game Reserve (KwaZulu-Natal)
- Manyeleti Game Reserve Reserve (Limpopo)
- Nylsvlei Nature Reserve (Limpopo)
- Blyde River Canyon Nature Reserve (Mpumalanga)
- Loskop Dam Game Reserve (Mpumalanga)
- Goegap Nature Reserve (Northern Cape)
- Witsand Nature Reserve (Northern Cape)
- Pilanesberg National Park (North West Province)
- Magaliesberg Protected Environment (North West Province)
- Cederberg Wilderness Area (Western Cape)
- Swartberg Nature Reserve (Western Cape)

Appendix F - IUCN RED BOOK LIST FOR SOUTH AFRICA²⁶

Table F1 - Numbers of Threatened Species in South Africa by Species Type

Mammals	Birds	Reptiles	Amphibians	Fishes	Mollusks	Other Invertebrates	Plants	Total
24	40	21	20	87	21	134	97	444

Table F2 - IUCN 2011 Threatened Species in South Africa with Assessed Trends.

Trends: Improving: ↑ Deteriorating: ↓
Stable: ↔ Uncertain/Unknown: ?

Critically Endangered			
#	Scientific Name	Common Name/Species Type	Trend
1	<i>Aloe pillansii</i>	Bastard Quiver Tree	↓
2	<i>Arthroleptella rugosa</i>	Frog	↓
3	<i>Barbus erubescens</i>	Twee River Redfin	↓
4	<i>Bunolagus monticularis</i>	Riverine Rabbit	↓
5	<i>Cadiscus aquaticus</i>	Aquatic Plant	↓
6	<i>Cotula myriophylloides</i>	Aquatic Plant	?
7	<i>Cryptochloris wintoni</i>	De Winton's Golden Mole	?
8	<i>Delosperma macellum</i>	Succulent Plant	↓
9	<i>Dermochelys coriacea</i>	Leatherback Turtle	↓
10	<i>Diceros bicornis</i>	Black Rhinoceros	↑
11	<i>Dicoma pretorienis</i>	Perennial Herb	↓
12	<i>Diomedea dabbenena</i>	Tristian Albatross	↓
13	<i>Doratogonus major</i>	Major Black Millipede	?
14	<i>Electrolux addisoni</i>	Ornate Sleeper Ray	?
15	<i>Encephalartos aemulans</i>	Ngotshe Cycad	↓
16	<i>Encephalartos cerinus</i>	Waxen Cycad	↓
17	<i>Encephalartos cupidus</i>	Blyde River Cycad	↓
18	<i>Encephalartos dolomiticus</i>	Wolkberg Cycad	↓
19	<i>Encephalartos dyerianus</i>	Lowveld Cycad	↓
20	<i>Encephalartos heenanii</i>	Heenan's Cycad	↓

²⁶ Source: <http://www.iucnredlist.org/>

21	<i>Encephalartos hirsutus</i>	Venda Cycad	↓
22	<i>Encephalartos inopinus</i>	Lydenburg Cycad	↓
23	<i>Encephalartos laevifolius</i>	Kaapsehoop Cycad	↓
24	<i>Encephalartos latifrons</i>	Albany Cycad	↓
25	<i>Encephalartos middelburgensis</i>	Middelburg Cycad	↓
26	<i>Encephalartos msinganus</i>	Msinga Cycad	↓
27	<i>Eptatretus octatrema</i>	Eightgilled Haggfish	?
28	<i>Gulella Puzeyi</i>	Mollusk	?
29	<i>Gulella salpinx</i>	Mollusk	?
30	<i>Haploblepharus kistnasamyi</i>	Shark	?
31	<i>Halephyrne rosei</i>	Table Mountain Ghost Frog	↔
32	<i>Hyperolius pickersgilli</i>	Pickersgill's Reed Frog	?
33	<i>Isoetes stephansenii</i>	Freshwater Plant	↓
34	<i>Isoetes wormaldii</i>	Freshwater Plant	↓
35	<i>Khadia beswickii</i>	Succulent Plant	↓
36	<i>Kneria sp. Nov 'South Africa'</i>	Southern Kneria 'South Africa'	↓
37	<i>Latimeria chalumnae</i>	Coelacanth	?
38	<i>Microbatrachella capensis</i>	Frog	↓
39	<i>Natalina beyrichi</i>	Pondoland Cannibal Snail	?
40	<i>Opisthopatus roseus</i>	Pink Velvet Worm	?
41	<i>Orthetrum rubens</i>	Elusive Skimmer	?
42	<i>Oxalis natans</i>	Freshwater Plant	?
43	<i>Oxalis uliginosa</i>	Freshwater Plant	↓
44	<i>Peripatopsis leonine</i>	Lion's Hill Velvet Worm	?
45	<i>Pristis microdon</i>	Large-tooth Sawfish	↓
46	<i>Pristis pectinata</i>	Wide Sawfish	↓
47	<i>Pristis zijsron</i>	Narrowsnout Sawfish	↓
48	<i>Proischnura polychromatica</i>	Mauve Bluet	↓
49	<i>Pseudobarbus burchelli</i>	Tradou Redfin	↓
50	<i>Syngnathus watermeyeri</i>	River Pipefish	↓

51	<i>Thunnus maccoyii</i>	Southern Bluefin Tuna	↓
52	<i>Tomichia cawstoni</i>	Freshwater Snail	?
53	<i>Tomichia natalensis</i>	Freshwater Snail	?
54	<i>Tomichia tristis</i>	Freshwater Snail	?
55	<i>Trachycystis clifdeni</i>	Dlinza Forest Pinwheel	?
56	<i>Trachycystis placenta</i>	Mollusk	?
57	<i>Vandijkophrynus amatolicus</i>	Amatola Toad	↓
Endangered			
#	Scientific Name	Common Name/Species Type	Trend
1	<i>Afrivalus knysnae</i>	Kynsna Banana Frog	?
2	<i>Aloe peglerae</i>	Aloe	↓
3	<i>Aloeides nubilus</i>	Cloud Copper	↓
4	<i>Amblysomus marleyi</i>	Marley's Golden Mole	?
5	<i>Amietophrynus pantherinus</i>	Western Leopard Toad	?
6	<i>Anhydrophryne ngongoniensis</i>	Mistbelt Chirping Frog	↔
7	<i>Anhydrophryne rattrayi</i>	Rattray's Frog	↓
8	<i>Aponogeton ranunculiflorus</i>	Aquatic Plant	↓
9	<i>Arthroleptella subvoce</i>	Frog	?
10	<i>Austroglanis barnardi</i>	Banard's Rock-catfish	↓
11	<i>Balaenoptera borealis</i>	Sei Whale	?
12	<i>Balaenoptera musculus</i>	Blue Whale	↑
13	<i>Balaenoptera physalus</i>	Fin Whale	?
14	<i>Barbus andrewi</i>	Berg-breed River Whitefish	↓
15	<i>Barbus serra</i>	Clanwilliam Sawfin	↓
16	<i>Barbus treurensis</i>	Treur River Barb	↔
17	<i>Barbus trevelyani</i>	Border Barb	?
18	<i>Bradypodion caffer</i>	Transkei Dwarf Chameleon	?
19	<i>Bradypodion taeniabronchum</i>	Smith's Dwarf Chameleon	?
20	<i>Breviceps sylvestrus</i>	Forest Rain Frog	?
21	<i>Chetia brevis</i>	Orange-fringed River Bream	?

22	<i>Chiloglandis bifurcus</i>	Incomati Suckermouth	?
23	<i>Chlamydephorus purcelli</i>	Purcell's Hunter Slug	?
24	<i>Chlorolestes apricans</i>	Basking Malachite	↓
25	<i>Chrysospalax trevelyani</i>	Giant Golden Mole	?
26	<i>Cineraria longipes</i>	Perennial Herb	↓
27	<i>Cordylus aridus</i>	Dwarf Karoo Girdled Lizard	?
28	<i>Cryptochloris zyl</i>	Van Zyl's Golden Mole	?
29	<i>Delsoperma gautengense</i>	Grassland Plant	↓
30	<i>Diomedea sanfordi</i>	Northern Royal Albatross	↓
31	<i>Doratogonus furculifer</i>	Baldplaas Black Millipede	?
32	<i>Doratogonus infragilis</i>	Strong Black Millipede	?
33	<i>Doratogonus minor</i>	Minor Black Millipede	↓
34	<i>Doratogonus rubipodus</i>	Ruby-legged Black Millipede	↓
35	<i>Doratogonus septentrionalis</i>	Northern Black Millipede	↓
36	<i>Doratogonus zuluensis</i>	Zululand Black Millipede	↓
37	<i>Encephalartos arenarius</i>	Alexandria Cycad	↓
38	<i>Encephalartos Eugene-maraisii</i>	Waterberg Cycad	↓
39	<i>Encephalartos horridus</i>	Eastern Cape Blue Cycad	↓
40	<i>Encephalartos lebomboensis</i>	Lebombo Cycad	↓
41	<i>Epinephelus marginatus</i>	Dusky Grouper	↓
42	<i>Eulophia coddii</i>	Terrestrial orchid	↓
43	<i>Gulella aprosdoketa</i>	Mollusk	?
44	<i>Gulella claustralis</i>	Mollusk	?
45	<i>Habenaria mossii</i>	Terrestrial Herb	↓
46	<i>Heleophryne hewitti</i>	Hewitt's Ghost Frog	?
47	<i>Holohalaelurus favus</i>	Honeycomb Izak	↓
48	<i>Holohalaelurus punctatus</i>	Whitespotted Izak	↓
49	<i>Isoetes capensis</i>	Freshwater Plant	↓
50	<i>Labeo seeberi</i>	Clanwilliam Sandfish	↓
51	<i>Laevicaulis haroldi</i>	Purcell's Hunter Slug	?

52	<i>Leptopelis xenodactylus</i>	Frog	?
53	<i>Lycaon pictus</i>	African Wild Dog	↓
54	<i>Melolobium subspicatum</i>	Shrublet	↓
55	<i>Metacnemis valida</i>	Kubusi Stream-damsel	↓
56	<i>Mystromys albicaudatus</i>	White-tailed Mouse	↓
57	<i>Natalobatrachus bonebergi</i>	Frog	↓
58	<i>Neamblysomus gunningi</i>	Gunning's Golden Mole	?
59	<i>Necrosyrtes monachus</i>	Hooded Vulture	↓
60	<i>Neophron percnopterus</i>	Egyptian Vulture	↓
61	<i>Neotis ludwiggi</i>	Ludwig's Bustard	↓
62	<i>Phalacrocorax neglectus</i>	Bank Cormorant	↓
63	<i>Phoebetria fusca</i>	Sooty Albatross	↓
64	<i>Pseudagrion inopinatum</i>	Badplaas Sprite	↓
65	<i>Pseudalthenia aschersoniana</i>	Aquatic plant	?
66	<i>Pseudobarbus afer</i>	Eastern Cape Redfin	↓
67	<i>Pseudobarbus asper</i>	Smallscale Redfin	↓
68	<i>Pseudobarbus burgi</i>	Berg River Redfin	↓
69	<i>Pseudobarbus phlegethon</i>	Fiery Redfin	↓
70	<i>Pseudobarbus quathlambae</i>	Maloti Minnow	↓
71	<i>Pterodroma incerta</i>	Atlantic Petrel	↓
72	<i>Rhinobatos cemiculus</i>	Blackchin Guitarfish	↓
73	<i>Rhinobatos rhinobatos</i>	Common Guitarfish	↓
74	<i>Romulea aquatica</i>	Aquatic Plant	↓
75	<i>Rostroraja alba</i>	Bottlenose Skate	↓
76	<i>Sandelia bainsii</i>	Eastern Cape Rocky	↓
77	<i>Sarathrura ayresi</i>	White-winged Flufftail	↓
78	<i>Scelotes inornatus</i>	Smith's Dwarf Burrowing Skink	?
79	<i>Serranochromis meridianus</i>	Lowveld Largemouth	?
80	<i>Silhouettea sibayi</i>	Sibayi Goby	?
81	<i>Spheniscus demersus</i>	African Penguin	↓

82	<i>Sphyrna lewini</i>	Scalloped Hammerhead Shark	?
83	<i>Sphyrna mokarran</i>	Squat-head Hammerhead Shark	↓
84	<i>Spizocorys fringillaris</i>	Botha's Lark	↓
85	<i>Thalassarche carteri</i>	Indian Yellow-nosed Albatross	↓
86	<i>Thalassarche chlororhynchos</i>	Atlantic Yellow-nosed Albatross	↓
87	<i>Thalassarche melanophrys</i>	Black-browed Albatross	↓
88	<i>Thunnus thynnus</i>	Atlantic Bluefin Tuna	↓
89	<i>Tomichia differens</i>	Freshwater Snail	?
90	<i>Tomichia ventricosa</i>	Freshwater Snail	?
91	<i>Tomichia zwellendamensis</i>	Freshwater Snail	?
92	<i>Trachycystis haygarthi</i>	Freshwater Mollusk	?
93	<i>Xenopus gilli</i>	Gill's Platanna	?
94	<i>Zoothera guttata</i>	Spotted Ground-Thrush	↓
Vulnerable			
#	Scientific Name	Common Name/Species Type	Trend
1	<i>Acinonyx jubatus</i>	Cheetah	↓
2	<i>Acropora anthocercis</i>	Coral	↓
3	<i>Acropora horrid</i>	Coral	↓
4	<i>Acropora retusa</i>	Coral	↓
5	<i>Acropora verweyi</i>	Coral	↓
6	<i>Acropora willisae</i>	Coral	↓
7	<i>Alopias pelagicus</i>	Pelagic Thresher	↓
8	<i>Alopias superciliosus</i>	Bigeye Thresher Shark	↓
9	<i>Alopias vulpinus</i>	Common Thresher Shark	↓
10	<i>Alveopora allingi</i>	Coral	?
11	<i>Amblysomus robustus</i>	Robust Golden Mole	?
12	<i>Anomastreaa irregularis</i>	Coral	↓
13	<i>Anthus chloris</i>	Yellow-breasted Pipit	↓
14	<i>Aponogeton angustifolius</i>	Aquatic Plant	?
15	<i>Austroglanis gilli</i>	Clanwilliam Rock Catfish	↓

16	<i>Balearica regulorum</i>	Grey Crowned-Crane	↓
17	<i>Barbus amatolicus</i>	Amatola Barb	?
18	<i>Barbus calidus</i>	Clanwilliam Redfin	↓
19	<i>Barbus motebensis</i>	Marico Barb	?
20	<i>Bradypterus sylvaticus</i>	Knysna Warbler	↓
21	<i>Breviceps bagginsi</i>	Frog	?
22	<i>Breviceps macrops</i>	Desert Rain Frog	↓
23	<i>Bucorvus cafer</i>	Southern Ground-Hornbill	↓
24	<i>Capensibufo rosei</i>	Rose's mountain Toad	?
25	<i>Carcharhinus longimanus</i>	Oceanic Whitetip Shark	↓
26	<i>Carcharhinus obscurus</i>	Dusky Shark	↓
27	<i>Carcharhinus plumbeus</i>	Sandbar Shark	↓
28	<i>Carcharias taurus</i>	Sand Tiger	?
29	<i>Carcharodon carcharias</i>	Great White Shark	?
30	<i>Carex subinflata</i>	Perennial Helophyte	?
31	<i>Centrophorus granulosus</i>	Gulper Shark	↓
32	<i>Centrophorus squamosus</i>	Deepwater Spiny Dogfish	↓
33	<i>Ceratogomphus triceraticus</i>	Cape Thorntail	?
34	<i>Certhilauda burra</i>	Red Lark	↓
35	<i>Cetorhinus maximus</i>	Basking Shark	↓
36	<i>Chlamydephorus burnupi</i>	Burnup's Hunter Slug	?
37	<i>Chlamydephorus dimidius</i>	Snake Skin Hunter Slug	?
38	<i>Chlorolestes elegans</i>	Elegant Malachite	?
39	<i>Chlorotalpa duthieae</i>	Dulthie's Golden Mole	?
40	<i>Chrysospalax villosus</i>	Rough-haired Golden Mole	?
41	<i>Circus maurus</i>	Black Harrier	↔
42	<i>Colpodium drakensbergense</i>	Aquatic Grass	↓
43	<i>Cordylus tasmani</i>	Tasman's Girdled Lizard	?
44	<i>Cotula filifolia</i>	Aquatic Plant	?
45	<i>Crinum campanulatum</i>	Aquatic Plant	?

46	<i>Cyanella aquatica</i>	Aquatic Plant	?
47	<i>Diomedea epomophora</i>	Southern Royal Albatross	↔
48	<i>Diomedea exulans</i>	Wandering Albatross	↓
49	<i>Doratogonus avius</i>	Solitary Black Millipede	?
50	<i>Doratogonus barbatus</i>	Bearded Black Millipede	?
51	<i>Doratogonus herberti</i>	Herbert's Black Millipede	?
52	<i>Doratogonus hoffmani</i>	Hoffman's Black Millipede	?
53	<i>Doratogonus meridionalis</i>	Southern Black Millipede	?
54	<i>Doratogonus natalensis</i>	Natal Black Millipede	?
55	<i>Doratogonus precarius</i>	Precarious Black Millipede	?
56	<i>Ecchlorolestes peringueyi</i>	Marbled Malachite	↔
57	<i>Egretta vinaceigula</i>	Slaty Egret	↓
58	<i>Encephalartos altensteinii</i>	Eastern Cape Giant Cycad	↓
59	<i>Encephalartos ghellinchkii</i>	Drakensberg Cycad	↓
60	<i>Encephalartos humilis</i>	Dwarf Cycad	↓
61	<i>Encephalartos ngoyanus</i>	Ngoye Dwarf Cycad	↓
62	<i>Encephalartos paucidentatus</i>	Barberton Cycad	↓
63	<i>Encephalartos princeps</i>	Kei Cycad	↓
64	<i>Encephalartos senticosus</i>	Jonzini Cycad	↓
65	<i>Encephalartos trispinosus</i>	Bushman's River Cycad	↓
66	<i>Epinephelus albomarginatus</i>	White-edged Rockcod	↓
67	<i>Epinephelus lanceolatus</i>	Queensland Groper	↓
68	<i>Equus zebra</i>	Mountain Zebra	?
69	<i>Eudyptes chrysocome</i>	Southern Rockhopper Penguin	↓
70	<i>Eudyptes chrysolophus</i>	Macaroni Penguin	↓
71	<i>Felis nigripes</i>	Black-footed Cat	↓
72	<i>Frithia pulchra</i>	Succulent	↔
73	<i>Galeorhinus galeus</i>	Whithound	↓
74	<i>Geronticus calvus</i>	Southern Bald Ibis	↓
75	<i>Gladiolus pole-evansii</i>	Terrestrial Plant	↔

76	<i>Grus carunculatus</i>	Wattled Crane	↓
77	<i>Grus paradise</i>	Blue Crane	↓
78	<i>Gyps coprotheres</i>	Cape Vulture	↓
79	<i>Haploblepharus fuscus</i>	Brown Shyshark	?
80	<i>Heliopora coerulea</i>	Blue Coral	↓
81	<i>Hemipristis elongata</i>	Snaggletooth Shark	?
82	<i>Hemismus guttatus</i>	Spotted Snout-burrower	?
83	<i>Heteromirafra ruddi</i>	Rudd's Lark	↓
84	<i>Heteronarce garmani</i>	Natal Electric Ray	?
85	<i>Himantura uarnak</i>	Reticulate Whipray	↓
86	<i>Hippopotamus amphibius</i>	Hippopotamus	↓
87	<i>Hirudo atrocaerulea</i>	Blue Swallow	↓
88	<i>Hyperolius horstockii</i>	Frog	↓
89	<i>Isurus oxyrinchus</i>	Shortfin Mako	↓
90	<i>Kajikia albida</i>	White Marlin	↓
91	<i>Labeobarbus capensis</i>	Clanwilliam Yellowfish	↓
92	<i>Lamna nasus</i>	Porbeagle	↓
93	<i>Lepidochelys olivacea</i>	Olive Ridley	↓
94	<i>Loxodonta africana</i>	African Elephant	↑
95	<i>Makaira nigricans</i>	Blue Marlin	↓
96	<i>Manta alfredi</i>	Reef Manta Ray	↓
97	<i>Manta birostris</i>	Giant Manta Ray	↓
98	<i>Marsilea schelpeana</i>	Mat-forming Plant	?
99	<i>Metacnemis angusta</i>	Ceres Stream-damsel	↔
100	<i>Mimetes chrysanthus</i>	Golden Pagoda	↑
101	<i>Moreae stagnalis</i>	Aquatic Plant	?
102	<i>Morus capensis</i>	Cape Gannet	↓
103	<i>Mustelus mustelus</i>	Common Smoothhound	↓
104	<i>Myosorex longicaudatus</i>	Long-tailed Forest Shrew	↓
105	<i>Natalina wesseliana</i>	Tongaland Cannibal Snail	?

106	<i>Neamblysomus julianae</i>	Juliana's Golden Mole	?
107	<i>Nebrius ferrugineus</i>	Tawny Nurse Shark	↓
108	<i>Negaprion acutidens</i>	Sharptooth Lemon Shark	↓
109	<i>Odontaspis ferox</i>	Small-tooth Sand Tiger Shark	↓
110	<i>Oreochromis macrochir</i>	Greenland Tilapia	?
111	<i>Oxalis dines</i>	Aquatic Plant	?
112	<i>Oxynotus centrina</i>	Angular Rough Shark	?
113	<i>Panthera leo</i>	Lion	↓
114	<i>Peripatopsis alba</i>	White Cave Velvet Worm	?
115	<i>Peripatopsis clavigera</i>	Knysna Velvet Worm	?
116	<i>Physeter macrocephalus</i>	Sperm Whale	?
117	<i>Plectropomus laevis</i>	Blacksaddled Coral Grouper	↓
118	<i>Potamonautes lividus</i>	Blue River Crab	?
119	<i>Procellaria aequinoctialis</i>	White-chinned Petrel	↓
120	<i>Procellaria conspicillata</i>	Spectacled Petrel	↑
121	<i>Pseudagrion newtoni</i>	Harlequin Sprite	↔
122	<i>Rhina ancylostoma</i>	Bowmouth Guitarfish	↓
123	<i>Rhincodon typus</i>	Whale Shark	↓
124	<i>Rhinoptera javanica</i>	Javanese Cownose Ray	?
125	<i>Rhynchobatus djiddensis</i>	Whit-spotted Wedgefish	↓
126	<i>Riccia alatospora</i>	Bryophyte	↔
127	<i>Romulea multisulcata</i>	Geophyte	↔
128	<i>Sagittarius serpentarius</i>	Secretarybird	↓
129	<i>Scylliogaleus queckettii</i>	Flapnose Houndshark	?
130	<i>Sheldonia puzeyi</i>	Mollusk	?
131	<i>Sphyrna zygaena</i>	Smooth Hammerhead	↓
132	<i>Squalus acanthais</i>	Piked Dogfish	↓
133	<i>Stangeria eriopus</i>	Natal Grass Cycad	↓
134	<i>Stegostoma fasciatum</i>	Leopard Shark	↓
135	<i>Syncordulia gracilis</i>	Yellow Presba	↔

136	<i>Syncordulia venator</i>	Mahogany Presba	↔
137	<i>Taeniurops meyeri</i>	Black-botched Stingray	?
138	<i>Thalassarche chrysostoma</i>	Grey-headed Albatross	↓
139	<i>Thalassarche salvini</i>	Salvin's Albatross	?
140	<i>Thunnus obesus</i>	Bigeye Tuna	↓
141	<i>Torgos tracheliotos</i>	Lappet-faced Vulture	↓
142	<i>Trachyandra erythrorrhiza</i>	Terrestrial Plant	↓
143	<i>Trigonoceps occipitalis</i>	White-headed Vulture	↓
144	<i>Turbinaria mesenterina</i>	Coral	?
145	<i>Urogymnus asperrimus</i>	Porcupine Ray	?
146	<i>Villarsia goldblattiana</i>	Perennial Herb	↓
147	<i>Zostera capensis</i>	Seagrass	↓

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