

# 118/119 Biodiversity and Tropical Forest Assessment for Angola



A baobab in Kissama National Park

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# 118/119 BIODIVERSITY AND TROPICAL FOREST ASSESSMENT FOR ANGOLA

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# ACRONYMS

CITES	Convention on International Trade on Endangered Species
CR	critically endangered species
CTMA	Technical Multisectoral Commission for the Environment
EN	endangered species
ENDIAMA	National Diamond Company of Angola
EU	European Union
FAA	Foreign Assistance Act of 1961
FAO	Food and Agricultural Organization of the United Nations
GDP	gross domestic product
GEF	Global Environmental Facility
GOA	Government of Angola
GTZ	German Technical Cooperation Agency
IDF	Institute for Forestry Development
IUCN	International Union for Conservation of Nature
MINADER	Ministry of Agriculture and Rural Development
MINUA	Ministry of Urbanism and Environment
NBSP	National Biodiversity Strategic Plan
NDE	National Directorate for the Environment
NDNR	National Directorate for Natural Resources
SADC	Southern African Development Community
SONANGOL	Angolan National Oil Company
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commission for Refugees
VU	vulnerable species





# EXECUTIVE SUMMARY

## Introduction

Section 118 of the Foreign Assistance Act (FAA) of 1961 requires that every USAID country development strategy statement or country plan include an analysis of: “1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests; and 2) the extent to which the actions proposed by the agency meet the needs thus identified.” Section 119 dictates that every country strategic plan developed by USAID shall include: “1) the actions necessary in that country to conserve biological diversity; and 2) the extent to which the actions proposed for support by the agency meet the needs thus identified.” Hence, the use of the 118/119 report to assist the development of country level plans or strategies is a legal requirement.

This document analyzes the status of biodiversity and tropical forest conservation in Angola, identifies principal problems and their causes, and provides the USAID mission with recommendations for including biodiversity and tropical forest conservation in a portfolio that is appropriate to Angola’s medium-term development needs. It has five objectives:

1. Assess the current state of biodiversity conservation and forest management in Angola.
2. Identify the root causes of processes and trends that threaten biodiversity and tropical forests.
3. Identify the immediate causes for the threats to biodiversity and tropical forests.
4. Identify priority actions necessary to better conserve tropical forests and biological diversity in Angola.
5. Provide specific recommendation to USAID/Angola on how to incorporate actions that will help conserve biodiversity and tropical forests into its strategic priorities given budget and programmatic constraints.

The lack of recent quantitative data detracts from the precision of this document, but from not its conclusions and recommendations.

This assessment was conducted by a team of five environmental specialists: two from the United States and three from Angola. The team, led by Joao S. de Queiroz, amalgamated a broad range of technical expertise and a thorough knowledge of Angola’s environment and its institutional and legal frameworks. The assessment included meetings with 29 key individuals from government institutions, donor agencies, NGOs, extractive industries, and with land owners, park managers, and farmers. The team took three field trips to protected areas and areas of high biodiversity.

## Country Profile

Angola covers 1,256,700 km<sup>2</sup>. It is situated on the west coast of Africa and borders Namibia (1,376 km), the Democratic Republic of Congo (2,511 km), the Republic of the Congo (201 km), and Zambia (1,110 km). Its coast extends for 1,650 km.

The country is divided into 18 provinces, and its population is estimated at 16 to 18 million, concentrated in urban areas such as Luanda, Huambo, Lubango, and Benguela and in the central plateau region. The bulk of the country supports population densities less than 10 inhabitants per km<sup>2</sup>. This population distribution is a result of the protracted conflict, during which the agricultural sector collapsed and massive movements of people from rural areas to urban centers turned Angola into one of the most urbanized countries in Africa.

Angola's climate is varied, due to the country's extension, topographic variability, and the north-flowing Benguela current. Annual rainfall in the southwestern corner is less than 100 mm, while in the northeast and some highland areas it exceeds 1,500 mm.

Angola ranges in altitude from sea-level to more than 2,500 m. The country harbors a variety of soil types, but most of its surface is dominated by infertile, coarse-textured Arenosols and highly weathered Ferralsols. More fertile Luvisols occur in regenerated rain and cloud forest areas once used for shade-coffee cultivation. The climatic, topographic, and edaphic variability interact to generate considerable ecological diversity. Angola is considered one of the most biodiverse countries in Africa.

Hydrologically, Angola is crucially important to southern Africa and the Congo basin. Seven of its nine watersheds, including the Cunene, Cuando, Cubango, Zaire, and Zambezi, are shared by neighboring countries. The country's densely populated "central plateau," where the Kwanza, Cunene, and Okavango rivers originate, is perhaps the most important landform in Southern Africa from a hydrologic viewpoint.

Updated quantitative information on Angola's vegetation cover is lacking. Estimates for forested land range from 19 percent to 53 percent. This wide range owes itself to different definition of "forests" and the lack of current information about the country's vegetation cover. Nonetheless, it can be stated with a reasonable degree of certainty that miombo woodland is the predominant vegetation, covering more than 50 percent of the country. True rainforests, where the bulk of the country's terrestrial biodiversity reside, occupy less than 2 percent of the country's surface. Savannas and miombo cover more than 80 percent of Angola's surface.

Angola's economy is experiencing extraordinary growth. In 2006 its gross domestic product (GDP) grew by 18.6 percent. Projections for 2007 range from 27 percent to more than 30 percent. This unusual economic performance and the building boom it fuels have yet to have a significant impact on poverty reduction: 68 percent of Angolans live below the poverty level, 28 percent of them in extreme poverty. Unemployment in urban areas is almost 50 percent. The country occupies position 161 on the United Nations Development Programme (UNDP) Human Development Index, one of the lowest in the world.

Oil and gas constitute 60 percent of Angola's GDP. Hydrocarbons account for 90 percent of the country's exports. Diamonds contribute 9 percent to the country's GDP. Extractive industries are the backbone of Angola's economy. Oil and diamond production are expected to grow exponentially over the coming years.

## Legal Framework Related to the Environment

Most of Angola's legal environmental framework dates back to colonial times. Laws are incompatible with Angola's status as an independent and democratic country and do not incorporate the advancements in conservation and environmental management thinking that have taken place over the past four decades.

The country has ratified several international conventions and protocols that have a bearing on the environment:

- Convention on Biological Diversity (1998)
- The United Nations Convention on the Law of the Sea (1990)
- International Treaty on Plant Genetic Resources (2006)
- United Nations Convention to Combat Desertification (2000)
- Convention on the Conservation of Migratory Species (2003)
- Convention on International Trade on Endangered Species (CITES; 2001)<sup>1</sup>
- International Convention on Pollution Prevention by Ships (MARPOL 73/78)
- International Convention on Cooperation and Combat against (shipping) Pollution by Hydrocarbons
- United National Framework Convention on Climate Change (UNFCCC; 2000)
- The Kyoto Protocol (2007)

Angola has also signed a number of regional and continental environment-related protocols and conventions, and is drafting a new constitution. Many of the provisions from the current constitution are likely to be carried over to the new constitution. The 1992 constitution states:

“All natural resources existing in the soil and subsoil, in internal and territorial waters, on the continental shelf and in the exclusive economic zone shall be the property of the State, which shall determine under what terms they are used, developed, and exploited.

“The State shall promote the protection and conservation of natural resources by guiding the exploitation and use thereof for the benefit of the community as a whole.

“All citizens shall have the right to live in a healthy and unpolluted environment. The State shall take the requisite measures to protect the environment and national species of flora and fauna throughout the national territory and maintain ecological balance.”

The Angolan Environmental Framework Law of 1998 is the overarching instrument for the implementation of the constitutional provisions. Article 13(1) prohibits “all activities that threaten the biodiversity, conservation, reproduction, quality, and quantity of biological resources ... especially those threatened with extinction.” The regulatory framework for the application of the law is incomplete or inadequate. This is particularly important in the case of regulations pertaining to environmental impact assessments.

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<sup>1</sup> Since the ratification and adoption of CITES have not yet been published in the Official Diary, its legal status is in limbo.

A number of sector-specific legal instruments also have a bearing on the environment. Whereas some are relatively modern, such as the Biological Aquatic Resources Law enacted in 2004, others are hopelessly outdated. The legal framework dealing with forests dates back to colonial times. New legal instruments for the sector are currently under development by the Government of Angola (GOA) with assistance from the Food and Agricultural Organization (FAO) of the United Nations.

Protected areas in Angola were created during the colonial era. The current legal basis for protected areas is provided by decree 43/77, which established the structure of the Ministry of Agriculture and defined five categories of protected areas: national parks, strict nature reserves, partial reserves, regional nature parks, and special reserves. No community-managed category is currently recognized.

Article 10 of the Land Law, enacted in 2005, states that all natural resources are state property and that the state's rights over the land are not transmissible. Article 14 establishes that the state can intervene in the management and concession of land for the purposes of environmental protection, while Article 16 affirms that the occupation and use of the land depends on a number of norms and standards for environmental protection, particularly with respect to the protection of landscape, flora and fauna, the preservation of ecological equilibrium and the right of citizens to a healthy and non-polluted environment.

Other environmentally important sector specific legislation includes the Law on Geologic and Mining Activities, which gives the state the authority to suspend mining activities that are harmful to the environment, and instructs concession holders to protect the environment. Sanctions are seldom, if, ever applied in spite of mining practices that are severely damaging to the environment.

In summary:

- The constitution recognizes the importance of the environment to the quality of life.
- Angola's legal environmental framework is transitioning from that of a colonial and war-torn past to one of a more modern state.
- Some legal instruments, particularly these pertaining to forestry and protected areas are outdated.
- Regulations for the application of certain instruments (i.e., the Decree on Environmental Assessment) are lacking or deficient.
- Sector specific regulatory instruments related to oil and mining cater for the protection of the environment but are largely ignored by the mining sector.

### **Institutional Framework**

The Ministry of Urbanism and Environment (MINUA), established at the end of 2002, is responsible for formulating and executing environmental policy. The Ministry has two principal sub-structures: the National Directorate for the Environment (NDE) and the National Directorate for Natural Resources (NDNR). The NDE is responsible for environmental education, environmental planning, environmental policing, and the development of environmental regulations. The NDNR is in charge of the protection of fauna, flora, and habitat, for the regeneration of degraded areas, and supporting the creation and management of conservation units.

While MINUA has legal jurisdiction over environmental matters, it has not assumed full responsibilities over important sectors of the environment. Furthermore, some of its units, such as the National Institute for the Conservation of Nature and the National Institute for the Promotion of the Environment, are not yet operational. MINUA has no presence in any protected area in the country, is chronically understaffed, and was unable to spend the more than \$40 million in its 2007 budget. In light of these functional deficiencies, other ministries, especially the Ministry of Agriculture and Rural Development (MINADER), play an important role in addressing environmental concerns.

MINADER has the mandate to define forestry policy and planning and directing all tasks related to forest resource management. MINADER's Institute for Forestry Development (IDF) continues to play a reduced and ineffective role in the management of forests and protected areas.

In addition to MINUA and MINADER, the Ministry of Energy and Water and the Ministry of Fisheries have a bearing on biodiversity conservation and environmental management. The Ministry of Fisheries is supposed to collaborate in the conservation of nature, especially for the marine environment.

There is no set provincial-level institutional structure for the environment that repeats itself from province to province. In most cases, however, jurisdiction over environmental matters is ascribed to the Provincial Directorate for Agriculture Fisheries and Environment. Directorate sectoral responsibilities fall under three ministries: MINADER, MINUA and the Ministry of Fisheries. In other cases, provincial governments have established an Environment Department under a Directorate of Urbanism and Environment, aligned with MINUA.

In summary, there is an acute lack of clarity about the environmental responsibilities of certain sectoral ministries and MINUA. This is particularly serious with respect to the functional overlap of MINUA and MINADER for the forestry sector.

### **International Donors**

The international donor community in Angola has not yet targeted the environment for investment. Nonetheless, a noticeable shift is evident; for example, the German Technical Cooperation (GTZ) and the Global Environmental Facility (GEF) recently approved projects with environmental components. Other donors are also exploring the possibility of undertaking environment-related activities in Angola. The FAO is contributing to forestry policy and legislation development, and UNDP is supporting the implementation of Angola's National Biodiversity Strategy and Action Plan. In short, donor interest in Angola's environmental issues is on the upswing.

Financial support for environmental activities from the extractive industries is small but significant. Esso (Exxon) is a key supporter of the Giant Sable Conservation Project, and SONANGOL has donated \$300,000 to the Kissama Foundation for its efforts to save Kissama National Park.

## The Status and Trends of Tropical Forests and Biodiversity

*Protected areas.* There are 20 protected area units in Angola covering approximately about 6 percent of the national territory, the lowest percentage of any African country. Of Angola's six national parks, only three (Kissama, Cangandala, and Bicular) have a minimal degree of management. The management of these three areas is a result of specific initiatives that could collapse without the tenacity of key individuals. MINUA is virtually absent from protected areas. The situation is grave; the International Union for Conservation of Nature considers Angola's protected areas "system" to be under severe threat. Some national parks (Mupa) are no longer viable as conservation units. Others are headed in the same direction.

*Forests, savannas, and woodlands.* During its 27 years of civil war Angola experienced a virtual depopulation of rural regions. This phenomenon allowed the vegetation cover, rivers, and streams to recover in areas that were once cultivated or used for livestock production. Poaching, however, decimated animal populations in most of the country. In contrast, the semi-arid and arid areas in the southwest third of the country, where transhumant pastoral systems exist, escaped this trend. In these areas, production systems remained relatively unaffected while urban areas and transport network were destroyed. These systems were threatened, however, by cattle ranches, which that interfered with migratory routes and access to water resources. Now, five years after the advent of peace, the situation is mostly unchanged: a healthy habitat without animals to inhabit it, and increasing urban demand for forest resources.

Angola is quickly losing its forest cover. Using a number of data sources, the team estimated that deforestation rates due to wood extraction for charcoal and firewood is responsible for an annual deforestation rate between 0.9 percent and 1.0 percent, concentrated around urban areas in ever-widening circles of deforestation. The slow but relentless reactivation of Angola's agricultural sector is associated with the expansion of slash-and-burn agriculture, another important driver of deforestation.

*Coastal and marine systems.* Angola's mangroves estuarine systems and coastal zones in general are under a number of pressures due their proximity to population centers and irregular settlements established during the war. Peace and rapid economic growth without effective environmental governance are compromising the future of some of the most productive coastal ecosystems in the country. The team was unable to undertake an exhaustive assessment of the situation of coastal systems, but the situation in key coastal ecosystems serves to illustrate the situation.

- Cacuaco Bay is severely impacted by human wastes from squatter camps, shanty towns, and industrial wastes from Angola's largest cement factory (CIMANGOL), the SONANGOL oil refinery, an asbestos tubing and sheet factory (CIMIANTO), and others.
- Ships using the bay have significant negative impacts on Luanda Bay and environs as they wash out bilges in or near the bay. Maintenance work on hulls is carried out without controls. Storm water from Luanda discharges directly into the bay, carrying with it human waste from broken sewage pipes. The bay also experiences pressures from mega-development projects along its southern shoreline.
- Estuaries and mangroves are under a number of pressures, including wood extraction and heavy poaching of manatees. International interests aim to establish

shrimp farms in mangroves within protected areas (Kissama National Park) Plans to build several hydroelectric dams along the Kwanza River<sup>2</sup> may have a dramatic impact on coastal mangrove ecosystems if they do not include adequate environmental impact mitigation and avoidance mechanisms.

In addition to damage to coastal habitats, seas turtles and manatees are under serious threat. An indicator of this is the decline in the probability of sighting a manatee in the Kwanza estuary, from 50 percent to 10 percent.

*Species diversity and threatened species.* Angola is home to at least 8,000 plant species, 275 mammal species, 78 amphibian species, 227 reptile species, and 915 bird species. The number of insect species exceeds 300. The country has the second highest number of endemic plant species in Africa (1,260), 10 endemic bird species, and 19 endemic reptile species. The country's two most famous endemics are the prostrate conifer (*Welwitschia mirabilis*) and the giant sable antelope (*Hippo tragus Niger variani*). Angola is home to 88 endangered, vulnerable, and critically endangered species.

Endemic bird species live primarily in the afro-montane forests that are not represented in Angola's protected areas system. Other threatened species include the green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), the olive ridley turtle (*Lepidochelys olivacea*), the chimpanzee (*Pan troglodytes*), and the lowland gorilla (*Gorilla gorilla*).

*Diamonds and rivers.* Mining practices in Angola have no regard for the environment. To mine diamonds from riverine alluvial deposits, the mining companies, with the acquiescence of Angola's National Diamond Company (ENDIAMA), move the river into artificial channels and use high pressure hoses to wash and sift the alluvium in the original channel for diamonds. The long-term environmental impacts are drastic and, in a time scale relevant to humans, irreversible. There are no measures to avoid, mitigate, or reverse the impact of diamond mining.

## **Principal Root Causes of Angola's Environmental Threats**

This assessment indicates that behind the negative trends affecting Angola's environment is a fast-growing economy without appropriate environmental governance. In short, the country's vertiginous economic growth in the absence of an institutional and regulatory framework to ensure that the environmental impact of economic activities are incorporated into development planning and implementation is a root cause of environmental degradation and biodiversity loss.

This problem is compounded because Angola's economic growth, which is based on the export of non-renewable resources such as oil and diamonds, does not generate sufficient employment.

## **Immediate Causes of Specific Environmental Problems**

*Deforestation as a result of charcoal production and fuelwood extraction.* The limited economic options available for nearly 50 percent of Angola's population, and their ability to freely exploit renewable natural resources, is a root cause for the unsustainable

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<sup>2</sup> The team heard of 11 such structures but was unable to confirm the number or magnitude.

exploitation of these resources and the loss of biodiversity, forest, and aquatic resources. The principal direct cause of deforestation is charcoal production, subtended by a demand for fuel by urban and rural households and the lack of alternative sources of income by urban and rural dwellers.

*Depletion of wildlife populations in forested areas as a result of commercial hunting.* The large number of freshly killed carcasses for sale along roads in the country's northern humid forests (Bengo, Uíge) indicates that poaching for commercial purposes threaten otherwise healthy populations of primates and small antelopes of Angola's northern forest areas. Poaching is a relatively easy source of cash in a country with limited employment possibilities.

*Degradation of coastal ecosystems, particularly mangroves, due to deforestation and hunting of keystone species.* Internally displaced people have not returned to their places of origin with the advent of peace. Many that settled along coastlines have elected to stay. The team saw evidence that the movement of people towards coastal areas continues at a reduced rate. The pressure on coastal resources, particularly on mangroves, continues unabated. In the absence of effective controls, wood harvesting and the killing of keystone species such as the African manatee are degrading mangrove ecosystems. The survival of marine turtles (leather back, olive, and green) that use Angola's coastline is in jeopardy due to the raiding of nests and killing of adult females.

*Absence of controls renders Angola's protected areas vulnerable to poaching, deforestation, and encroachment.* Angola's protected areas are in critical condition. There is practically no effective government control in any of the six national parks. This lack of control makes it easy for poachers, charcoal producers, and livestock herders to practice their trades within park boundaries. In some cases, foreign interests, with the acquiescence of local authorities, plan to establish large development projects (shrimp farms, hotels) within park boundaries. The absence of government controls or presence in protected areas renders these areas vulnerable to a broad spectrum of pressures. If this situation continues, many of Angola's protected areas will soon become unviable as conservation units.

*Lack of legal and de facto protection renders Angola's centers of high biodiversity and endemism highly vulnerable.* Angola's afro-montane forests, known to be habitats for several species of endemic birds and plants, are not represented in the country's system of protected areas. Angola's northwestern forested areas, formerly coffee farms, are areas of high biodiversity. Neither ecosystem is represented in Angola's protected areas system. Because Angola's most biodiverse ecosystems are not represented in the country's system of protected areas, they are seriously threatened. Legal protection does not ensure the conservation of habitats or species in Angola, but a legally recognized conservation category does offer hope.

*Poaching and habitat encroachment threaten the survival of Angola's national symbol and most charismatic endemic: the giant sable.* A giant sable population with an estimated 30 individuals exists in Cangandala National Park, and there are indications of a larger, unprotected population in Luando Reserve to the south of Cangandala. The ever-expanding circle of deforestation is now within a few kilometers of Cangandala's boundaries. More families are beginning to settle in the park's vicinity, where they practice slash-and-burn cultivation. The situation in Luando Reserve is unknown but



likely to be critical. Unless a more concerted and sustained effort is made to save the giant sable, these pressures will lead to its extinction.

*Without environmental impact assessment and regulatory capacity, unbridled growth threatens waterways and coastal systems.* Angola's environmental governance apparatus is highly ineffective and the environmental consciousness of decision makers is quiescent. Under these circumstances, the environment is being trampled under the banner of development. This threat applies to virtually every ecosystem in Angola, but it is most imminent in waterways and coastal areas where large development projects are planned. In the absence of an effective environmental impact assessment, mitigation and enforcement system these activities will seriously affect the ecology of these waterways and associated coastal systems.

*Poor environmental management by mining companies has devastating environmental impact on rivers and riverine vegetation.* To Angola's national diamond company, ENDIAMA, the environmental impact of its activities is a normal side-effect of doing business. Environmental management and impact mitigation are unessential costs. Hence, partner companies operate without addressing the negative environmental impact of their mining activities leaving behind devastated stretches of river and riverine vegetation.

### **Actions Necessary to Decrease Pressures on Biodiversity and Tropical Forests, and Recommendations to USAID**

*Current USAID actions that address threats to biodiversity and tropical forests.* The three program areas under USAID/Angola's strategy — 1) investing in people; 2) economic growth; and 3) governing justly and democratically — do not explicitly address the root causes of negative environmental trends in Angola. The current strategy will guide the mission's investments through FY2009. There was no clear indication that an environmental component would be included the next strategy.

*The need for a conceptual shift.* There are indications that the mission has shifted the strategic focus under program area 2 from the one-dimensional "economic growth" to the multi-dimensional "economic development."<sup>3</sup> This is a step in the right direction; however, the concept of "sustainable development" would explicitly recognize the importance of good environmental stewardship to the future of the country and the well being of its people.

### **Elevating the Environmental Consciousness of Angolan Government and Civil Society**

*The need:* Angola's government is focused on getting the country's economy back on its feet, and the first step in this process has been the rebuilding of the country's infrastructure. Environmental concerns are low-priority. Likewise, Angolan households are more concerned about meeting daily needs than on the negative environmental impacts that their activities may have. Therefore, it is necessary to elevate the

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<sup>3</sup> The USAID/Angola Web site lists three program areas 1) democracy and governance; 2) economic growth; 3) health. The information suggesting a strategic shift from "economic growth" to "economic development" was provided by a reviewer of this document's first draft.

environmental consciousness of the Angolan government about the importance of good environmental stewardship.

*Recommendation:* The donor community, perhaps under USAID's leadership, can help place the environment on the government's screen by initiating a discussion about the importance of Angola's environment, particularly from the standpoint of the country's post-petroleum future. The point of departure could be the organization of a high-visibility conference on the environment sponsored by several donors, including the United Nations.

### **Help Create Protected Areas in High Biodiversity Ecosystems**

*The need:* Angola's afro-montane forests are not represented in the country's protected areas system. The same is true of the country's humid forests in what were once coffee producing areas. This situation places a great deal of Angola's natural heritage in peril. There is a need to designate and legalize representative segments of Angola's most biodiverse ecosystems (afro-montane and humid Guineo-Congolian forests) as protected areas.

*Recommendation:* USAID could help conserve Angola's biodiversity by working with an interested provincial government and MINUA to create at least one protected area in highland forest areas. Previous reports (IUCN 1992) recommended that legal protection be secured for sections of the afro-montane forest of Morro do Moco. Illustrative activities include: 1) a biological and socio-economic study to identify parts of these biodiverse ecosystems that could be conserved; 2) map and prioritize these areas; 3) propose a legal figure and management model; 4) develop a business plan; and 5) assist the local government or/and MINUA prepare a proposal for the creation of a protected area to the Council of Ministers. If successful, USAID should help to establish the protected area, providing personnel training, development of geo-reference databases, and development of threats-reduction program.

### **Help Save Protected Areas through a Development and Conservation Activity**

*The need:* There are two good reasons to support the management of selected protected areas. First, there is an urgent need to conserve elements of Angola's natural heritage. Second, Angola needs examples of well-managed protected areas.

*Recommendation:* Three protected areas in Angola have rudimentary management systems: Kissama National Park, Cangandala National Park, and Bicuar National Park. USAID should choose one or more of these parks in which to implement sustainable protected area management systems, including 1) community-based natural resources management with communities within and near park boundaries; 2) a protected area patrol system, preferably using local inhabitants; 3) an ecosystem management and recovery component; 4) a training component for park guards, tourist guides, and field biologists; and 5) a sustainable financing component.

### **Activate the Giant Sable Conservation Fund**

*The need:* Angola's current government budgeting procedure does not ensure a constant flow of resources for on-the-ground conservation activities. The financial situation of

individual conservation activities is precarious. This condition typifies the Giant Sable Conservation Project.

*Recommendations:* The Giant Sable Fund is a nonprofit organization, established in the United States, to fund activities to protect and study the Giant Sable. The fund is affiliated with Citizens Energy, which provides legal, financial, and tax audit and review supervision. USAID should commission an analysis to determine how best to capitalize and activate the fund so that it can start to realize its potential.

### **Strengthen Angolan Conservation NGOs**

*The need:* The Government of Angola is currently unable to manage protected areas. In the meantime, Angolan NGOs have taken the lead but have limited capacity to assume this task effectively.

*Recommendation:* The Kissama Foundation leads one of the most visible conservation activities in Angola, the management of Kissama National Park. The foundation has secured resources from SONANGOL and other donors to cover administrative expenses and field operations. USAID/Angola should consider working with the Kissama Foundation, in the context of a conservation project for Kissama National Park, to improve its technical administrative and financial management capabilities and diversify its sources of funding.



## SECTION A. INTRODUCTION

### A1. Legal Requirement

Section 118 of the Foreign Assistance Act (FAA) of 1961 requires that every USAID country development strategy statement or country plan include an analysis of: “1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests; and 2) the extent to which the actions proposed by the agency meet the needs thus identified.” Section 119 dictates that every country strategic plan developed by USAID shall include: “1) the actions necessary in that country to conserve biological diversity; and 2) the extent to which the actions proposed for support by the agency meet the needs thus identified.” Further legal requirements for an environmental assessment is provided by Section 117: “Special efforts shall be made to maintain and, where possible, restore the land, vegetation, water, wildlife and other resources upon which depend the economic growth and human well being, especially of the poor.”

The current USAID/Angola strategic plan runs from FY2006 to FY2009. This year (2008), the mission will initiate the process towards the completion of a full-blown Country Assistance Strategy for the FY2009-FY2014 period. Unless directed to proceed differently, the mission will continue to use the current strategy to guide its activities through 2009.

The current USAID/Angola strategy incorporates three program areas:

1. Investing in people<sup>4</sup>
2. Economic growth
3. Governing justly and democratically

These program areas and associated activities respond to the needs of a country emerging from four decades of war. Now that Angola is six years into a period of peace, the mission has shifted its focus from recovery to sustainable development; after all, Angola currently has the fastest economic growth rate in the world. One concern expressed in this document is the impact of this extraordinary economic growth on the environment.

This is an opportune moment to address environmental issues. This document provides the USAID mission with suggestions for including biodiversity and tropical forest conservation in a portfolio that is appropriate to Angola’s medium-term development needs. It recognizes the hurdles that must be overcome to elevate environmental concerns to the appropriate level in Angola’s development agenda. These recommendations also tie in with other mission interests, such as governance and economic development.

A 118/119 analysis for Angola was conducted in 2006 as part of the 2006-2009 USAID/Angola strategic planning process. While limited by the lack of recent original information, the analysis provides a good overview of the situation at that time. This document updates and expands the 2006 document, adding important insights and

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<sup>4</sup> During the meeting with the USAID/Angola staff, it was stated that the “investing in people” program area focused on health.

suggestions based on interviews, field visits, and recent studies and documents. Unfortunately, the lack of recent quantitative information that compromised the depth of the 2006 analysis continues to be a limiting factor for any environmental analysis in Angola, including the development of the National Biodiversity Strategy and Action Plan (MINUA 2006a). The lack of quantitative, up-to-date information does not, however, detract from the conclusions and recommendations in this report.

The report is organized into five sections. This introduction, Section A, describes the purpose and objectives of the assessment. Section B is a country profile that describes the physical environment, social conditions, and institutional and legal framework that affect the status of forest resources and biodiversity. Section C assesses the status of biodiversity and tropical forest resources, followed by a discussion of the root causes for the environmental problems in Section D. The document ends with recommended actions to help reduce the threats to biodiversity and tropical forests in Angola.

## **A2. Purpose and Objectives**

The purpose of this assessment is to ensure compliance with Sections 118 and 119 of the FAA, as amended, and to inform USAID/Angola's strategic planning exercise as per the Strategic Framework for Foreign Assistance and country strategy guidelines under ADS 201.3.4.11 and ADS 204.5. The objectives of the assessment are to:

- Assess the current state of biodiversity and forested areas in Angola.
- Identify the root causes of processes and trends that threaten biodiversity and tropical forests.
- Identify the immediate causes for the threats to biodiversity and tropical forests.
- Identify priority actions necessary to better conserve tropical forests and biological diversity in Angola.
- Provide specific recommendation to USAID/Angola about how to incorporate biodiversity and tropical forests conservation actions into its strategic priorities given budget and programmatic constraints.

## **A3. Methods**

### **A3a. Team Composition**

This assessment was conducted by team leader Joao S. de Queiroz, Hugh Safford of the U.S. Forest Service, and local counterparts Vladimir Russo, Pedro Vaz Pinto, and Abias Huongo.

- Dr. Queiroz holds a Ph.D. in range science, a M.Sc. in soil genesis, and a B.Sc. in soil science. He has more than 23 years of experience in natural resources and environmental issues, including 10 years in Africa. He worked with USAID for seven years and has designed, managed, and evaluated biodiversity conservation projects.
- With a Ph.D. in ecology, Hugh Safford is the senior Pacific Southwest regional ecologist for the U.S. Forest Service. He has conducted ecological research and training in Angola and other African countries.
- Mr. Russo is senior advisor to Angola's Ministry of Urbanism and Environment (MINUA) and director of Holisticos, an environmental consulting firm in Luanda.

He has a master's degree in environmental education and post-graduate training in environmental legislation.

- Vaz Pinto has a degree in forestry and natural resources management. He is the director of the Kissama Foundation and coordinator of the Research Center for Environment and Natural Resources Management at the Catholic University of Angola. Mr. Vaz is also the director of the Giant Sable Conservation Project and a renowned Angolan bird expert.
- Mr. Huongo is a psychologist who has become a producer of environmental radio shows and leader of a number of environmental organizations and networks.

### **A3b. Meetings and Interviews**

The team conducted open-ended interviews with 29 individuals (Annex A), including political appointees in high-level positions in the Ministry of Urbanism and Environment (MINUA), Ministry of Agriculture and Rural Development (MINADER), Angolan NGOs Action for Rural Development and Environment, the Kissama Foundation, Rede Maiombe, and Futuro Verde, the Angolan National Diamond Company (ENDIAMA), British Petroleum, Tullow Oil, the Food and Agricultural Organization of the United Nations (FAO), the United Nations Development Program (UNDP), the European Union (EU), and the United Nations High Commission for Refugees (UNHCR). The team also met with field personnel in Kissama and Cangandala national parks.

### **A3c. Literature Review**

The team reviewed a number of key documents, which are listed in the bibliography, and the following Web sites: the World Conservation Union ([www.iucn.org](http://www.iucn.org)), British Petroleum ([www.bp.com](http://www.bp.com)), USAID/Angola ([www.usaid.gov/ao](http://www.usaid.gov/ao)), Benguela Current Large Marine Ecosystem Program ([www.bclme.org](http://www.bclme.org)) Angolan Ministry of Finance ([www.minfin.gv.ao](http://www.minfin.gv.ao)), the Biodiversity Convention ([www.cbd.int](http://www.cbd.int)), and the World Resources Institute's Earthtrends ([www.earthtrends.wri.org](http://www.earthtrends.wri.org)).

### **A3d. Field Trip**

In a country where data on the environment is deficient or outdated, field observations and conversations with local people provide valuable insights. The team covered approximately 2,400 km by road:

- 200 km northeast of Luanda, beyond Caxito in the Dembos forest area, the team visited abandoned coffee farms and roadside stalls and markets selling dried game meat and freshly killed carcasses.
- 180 km south of Luanda, in Kissama National Park (KNP), the team visited the game warden, mangroves, and enclosures where animals have been introduced, and observed the pressures to which the park is being subjected.
- 800 km to Cangandala National Park (CNP), where the team met with community guards, observed activities of the Giant Sable Conservation Project, and witnessed threats to the survival of this species and the integrity of the park.





## SECTION B. COUNTRY PROFILE

Angola's varied ecosystems render the country one of the most biodiverse in Africa. This section describes key features of Angola's environment. It provides the background for the ensuing discussions on threats, root causes, and opportunities for interventions that will help conserve biodiversity and tropical forests.

### B1. Physiography

#### B1a. Location and Administrative Divisions

Angola covers 1,256,700 km<sup>2</sup>. It is situated on the west coast of Africa between 4° 22' and 18° 02' south latitude and 11° 41' and 24° 05' west longitudes (Exhibit 1). The country borders Namibia in the south (1,376 km), the Democratic Republic of Congo (2,511 km) and the Republic of the Congo (201 km) in the north, and Zambia (1,110 km) in the east. Angola's coast extends 1,650 km. Angola is divided into 18 provinces.

Exhibit I. Administrative map of Angola



#### B1b. Climate

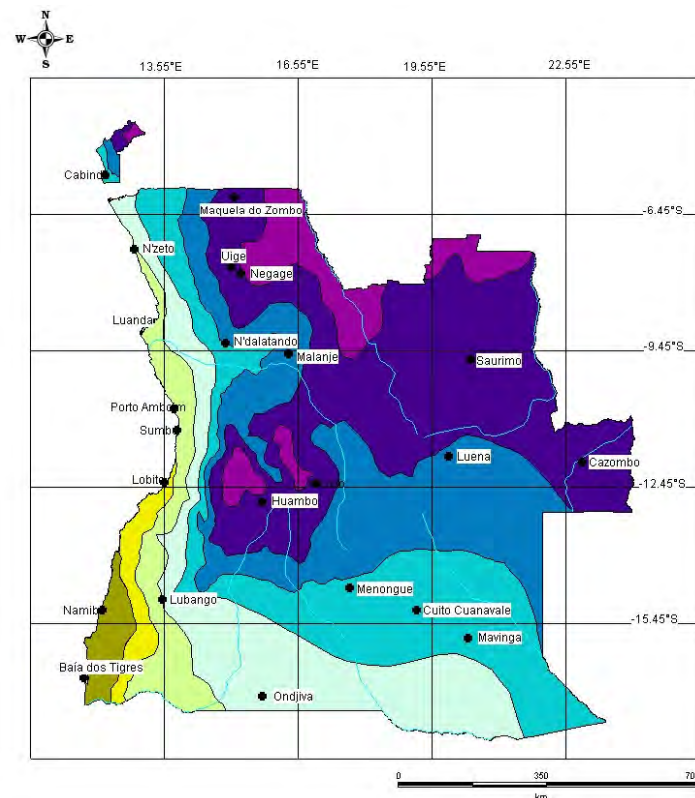
Two factors have a strong effect on Angola's climate: the South Atlantic high-pressure cell and the cold northward flowing Benguela current. The high-pressure cell limits the southward migration of the inter-tropical convergence zone; the Benguela current generates a strong temperature inversion along the coast that has a pronounced

stabilizing effect on the lower atmosphere. This preempts the upward movement of cloud-forming moist air along the Namibian and southern portions of the Angolan coastline. The result is a gradient of increasing precipitation from south to north and from west to east (Exhibit 2).

In the extreme southwest, part of the Namib Desert biome, average rainfall is less than 100 mm per annum. Here, the endemic conifer *Welwitschia mirabilis* occurs. As one moves north along the coast, rainfall increases to more than 1,000 mm in Cabinda. The increase in precipitation without changes in altitude is caused by changes in the trajectory of the cold, north-flowing Benguela current.

As one moves inland, the effect of the Benguela current' is attenuated and topographic highs create conditions that favor cloud formation and therefore increased precipitation. The topography-induced gradient in precipitation is steepest in the transitional zone that separates the coastal area from the elevated inland. In mountainous areas, moisture available to plants as mist is a strong determinant of vegetation (Barbosa 1971). Hence, the elevated areas ( $\geq 1,500$  m) around Huambo (Exhibit 3) receive more than 1,500 mm of rainfall. To the east and northeast, precipitation is more related to continental conditions and the movements of the inter-tropical convergence zone. In the extreme northeast, Angola receives more than 1,500 mm of rainfall.

Temporal rainfall distribution is characterized by distinct wet (October – May) and dry (June – September) seasons. March and April are the wettest months; June and July are the driest. Mean annual temperatures range from 14°C at the highest points to more than 26°C in some low-lying northwestern coastal areas. The cold season coincides with the dry season.

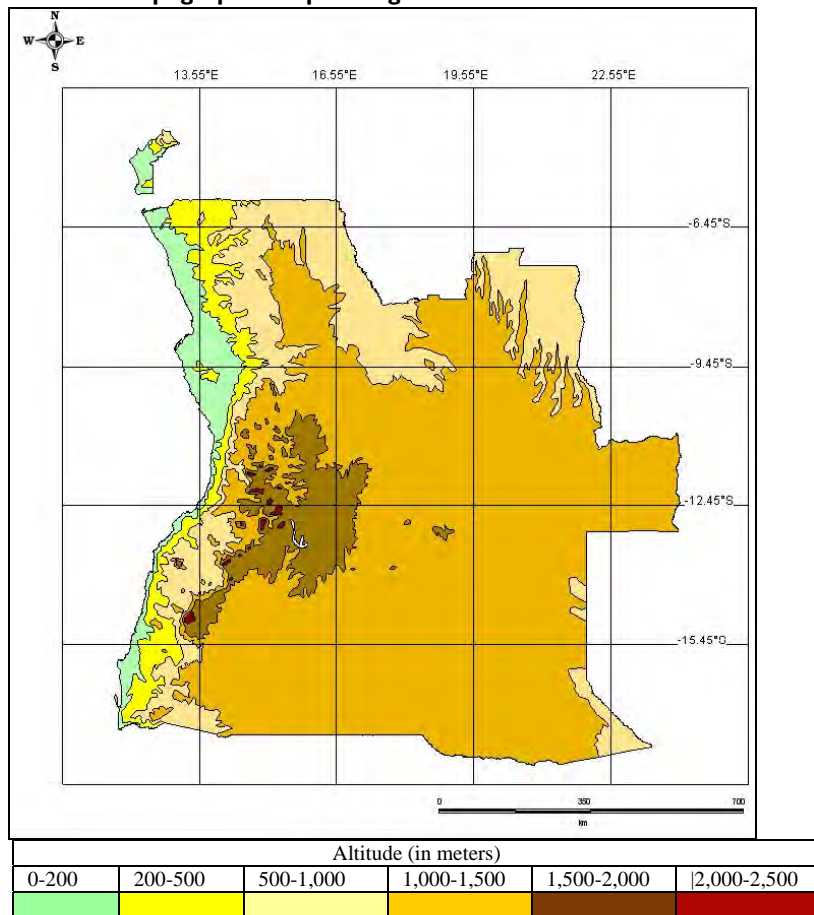


**Exhibit 2. Rainfall in Angola. The cold Benguela current creates a steep precipitation gradient along the coastline. Inland, the climate is controlled by topography, continental conditions, and movements of the inter-tropical convergence zone (IUCN 1992).**

### B1c. Topography and Geology

A low-lying (0-200 m) undulating coastal belt stretches from Cabinda to the southern border with Namibia (Exhibit 3). This geomorphic unit, composed of sedimentary rocks and weakly consolidated sediments, ranges in width from 200 km south of Luanda to around 10 km between Benguela and Namibe. To the east, a deeply incised strip separates the coastal belt from the interior plateau and mountainous areas. This transitional geomorphic unit — etched on schists, arkoses, and quartzites — ranges from 200-500 m in altitude and from 60-250 km in width. Geomorphologically, it is composed of pediments in the arid south and residual hills and narrow valleys that gain altitude as one moves inland. In its southern reaches, the transitional belt sports inselbergs and massifs that tower 1,000 m above the regional base level.

**Exhibit 3. Topographic map of Angola**



An elevation bulge between 1,500 and 2,000 m located in the midwestern section of the country (Exhibit 3) is known as the “central plateau.” This is a rolling erosional surface underlain mostly by basement complex rocks such as gneiss, granites, and migmatites. Considering southern Africa’s regional hydrology, the central plateau is an extremely important land unit. It hosts the headwaters of the Cunene and Cubango rivers and feeds some of Angola’s principal rivers, such as the Kwanza, Cutato, and Cunhinga. The Cubango is the primary source of water for the Okavango River and its delta in Botswana.

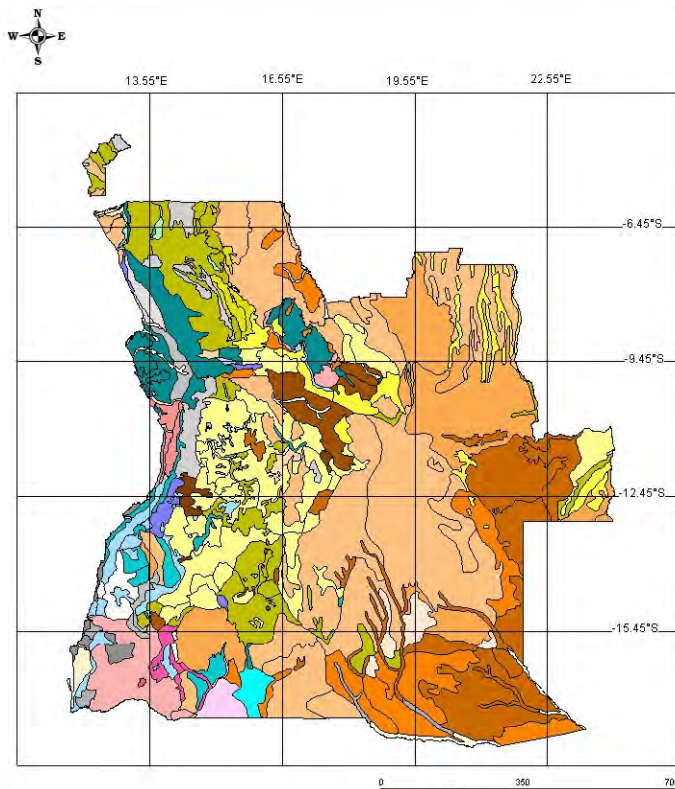
A number of important mountains separate the central plateau from the westerly sloping transitional zone. These elevated points exceed 2,000 m and support afro-montane

forests considered to be centers of high biodiversity and endemism. One such elevated feature is Mount Moco.

Most of the country east of the coastal areas and the central plateau lies between 1,000 and 1,500 m. These areas are mostly undulating and covered by medium- to coarse-textured sediments associated with the Kalahari system.

**B1d. Soils**

Angola hosts significant soil variety (Exhibit 4). The two dominant soil groups are Arenosols and Ferrasols. Arenosols dominate the eastern two-thirds of the country, where the parent material consists of coarse-textured sediments. Ferrasols occupy large portions of the western highlands and adjacent areas. These two infertile soil groups cover more than 80 percent of Angola’s surface. Other important soil types include Luvisols, Calcisols, and Cambisols. The Luvisols are common in the northeastern hills and adjacent slopes where coffee cultivation used to be an important activity during colonial times. This area is now covered by dense forests that support a healthy population of small antelopes and avian fauna. Because of its relatively high agricultural potential, the opportunity cost of conservation in these fertile areas is higher than in areas dominated by Arenosols, where cultivation is a marginal activity at best. That is most likely one reason why the colonial government did not create any protected areas in Angola’s highly productive highlands.



**Exhibit 4. Generalized soils map of Angola (adapted from FAO, 1997). Due to scale and original map quality limitations, not all soil types are represented in the legend. Poor legend color choices in the original map made it difficult to identify smaller units.**

Arenosol	Ferrasol	Luvisol	Calcisol	Cambisol	Regosol	Solonetz	Vertisol

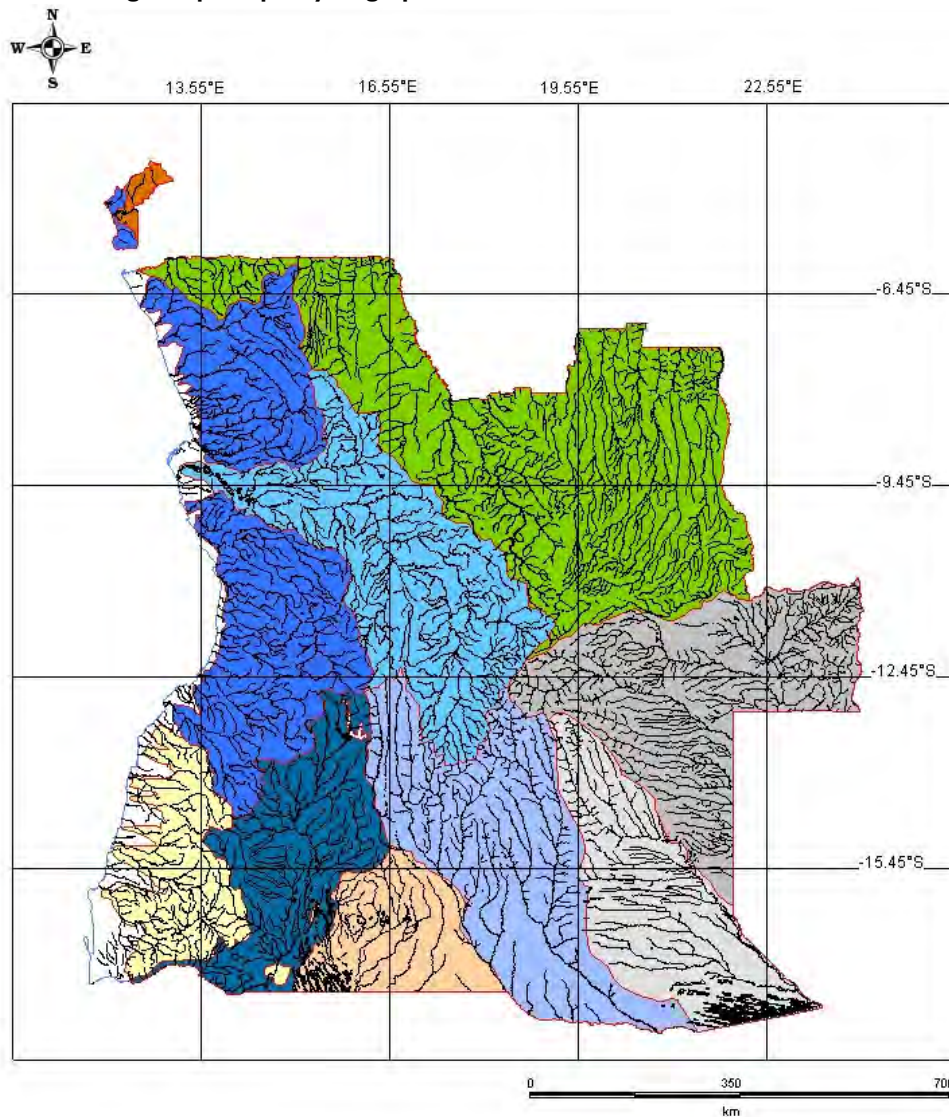


## B1e. Hydrography

Excluding the province of Cabinda, Angola may be subdivided into nine large hydrographic basins (Exhibit 5):

1. Perennial coastal system
2. Ephemeral coastal system
3. Zaire system
4. Cunene system
5. Kwanza system
6. Cubango system
7. Cuando system
8. Zambezi system
9. Cuanhama, or Etosha, system

**Exhibit 5. Angola's principal hydrographic basins**



Principal Hydrographic Basins								
Coastal (perennial)	Coastal (ephemeral)	Zaire	Cunene	Kwanza	Cubango	Quando	Zambezi	Cuanhama (Etosha)

A glance at Exhibit 5 reveals two important facts. First, seven of the nine major hydrographic basins are transnational. Of these, four originate in Angola (Cunene, Cubango, Cuando, and Cuanhama). Furthermore, the Cunene, Cubango, and Cuando rivers flow into two arid countries, Namibia and Botswana. The Cuanhama system is an enclosed basin that feeds into Namibia's Etosha pan system, one of the most important wildlife conservation areas in Southern Africa. How Angola treats its hydrographic basins is of utmost importance to neighboring countries, particularly those to the south that are dominated by arid conditions.

Second, from a hydrologic viewpoint, the central plateau is of utmost importance to Angola and to the entire Southern Africa region. The headwaters of three major rivers — Kwanza, Cunene, and Cubango — originate there, with the majority of secondary rivers that make up the coastal drainage systems.

From a regional standpoint, the well-being of Angola's shared watersheds is extremely important, with its central plateau perhaps the most important water catchment in the region. The economic well-being of millions of people in the region depends on how these watersheds are managed. This is both an opportunity for collaboration and a potential source of regional conflict.

#### **B1f. Vegetation**

There is no reliable data on vegetation cover in Angola. According to FAO (2003), IDF (2004), and MINUA (2006a), "forested" land covers about 53 million ha of Angola, about 43 percent of the national territory. This number is identical to the number given in the 1970 "Carta Fitogeográfica de Angola" (Barbosa 1970), and is likely a reliable estimate of actual forest cover at that time. However, other estimates differ. For example, IDF (2004) estimates 35 percent using the same number of hectares, USAID (2006) estimates 19 percent, United Nations Environment Programme (2002) estimates 56 percent, Caetano (1999) estimates 17 percent, and the Mondabay Rainforest Web site estimates 47.4 percent. The discrepancies may be due to poor math or different ways of classifying vegetation cover.<sup>5</sup> Furthermore, no post-war forest assessment exists; the numbers provided here are only indicative. Based on arguments provided in a supporting paper prepared by Safford (2008), a best-guess estimate of current forest cover is probably 40-45 million ha, or 35 percent of the national territory.

Of the area currently covered by forest, however defined, MINADER/MINUA (2006) states that about 80 percent is miombo and savannah formations, and only 2 percent is rainforest *sensu strictu*. Mangrove formations, of extreme importance for coastal ecosystem function (species diversity, primary productivity, fish reproduction, sediment retention, water purification, etc.) are found on about 1,250 km<sup>2</sup> of estuarine lands, or about 0.1 percent of the Angolan national territory. Aside from forestlands, other general land categories include rangelands (savannahs), about 23 percent of the national territory, and arable lands (including permanent cultivation), which add to about 3 percent (MINUA 2006a).

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<sup>5</sup> The standard international definition of "forest" is an area with  $\geq 25$  percent canopy cover by trees (UNESCO 1973; "savannah" is usually considered to be a grass-dominated system with sparse trees [by the UNESCO definition,  $< 25$  percent cover]).

The proportional representation of major potential vegetation types, according to IDF (2004), is given in Exhibit 6. These numbers do not apply to the current vegetation cover, but rather to the potential cover in the absence of major anthropogenic disturbance. IDF (2004) estimates that although more than 45 percent of Angola would likely support miombo woodland (Exhibit 6), but the actual coverage is lower, as much miombo has been cleared for agriculture, urban construction, charcoal production, and the like. Based on these estimates, it appears that 60-70 percent of Angola has the capacity to support tree-dominated landscapes (i.e., in the absence of major human disturbance); or 80-90 percent if savannah systems are included. IDF's estimates appear to be based on the 1970 Carta Fitogeográfica de Angola (Barbosa 1970), which divides potential vegetation into 32 types, many of which are mosaics of different life forms.

**Exhibit 6. Estimates of cover for broad vegetation categories (source: IDF 2004)**

Potential vegetation type	% of total area
Open tropical forest ( <i>Miombo</i> )	45.4
Dry tropical woodland (savannah)	24.2
<i>Miombo</i> -savanna mosaic (transition)	19.8
Grassland/meadow	5.2
Steppe	3.1
Tropical rainforest ( <i>Maiombe</i> )	2.0
Desert	0.3

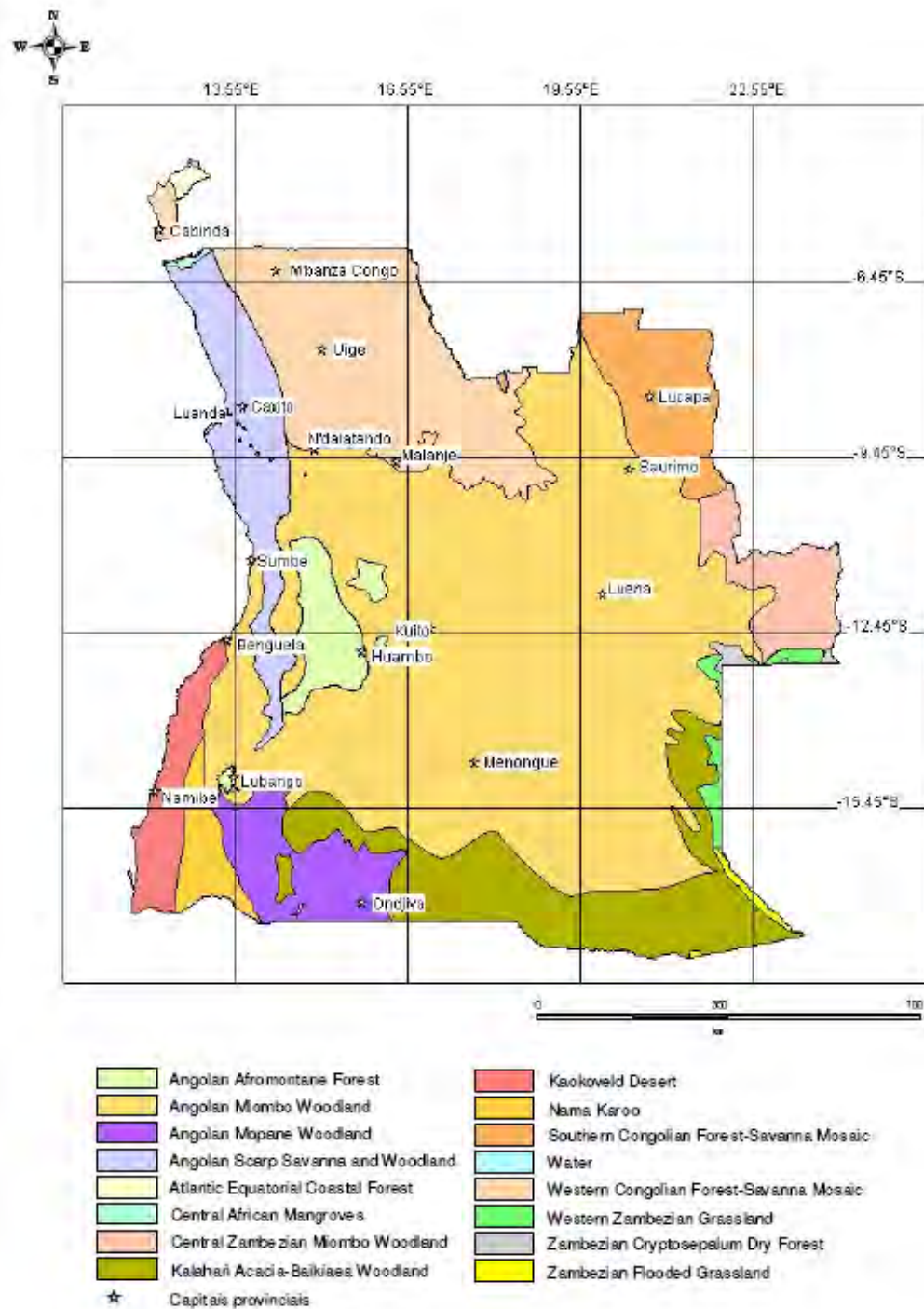


**Miombo, such as this one in Cangandala National Park, is the predominant vegetation type in Angola.**

Exhibit 7 is a generalized map of the broad potential vegetation types, derived from Barbosa's (1970) detailed map and extracted from MINUA (2006a). Miombo is clearly the dominant ecoregion, while Angolan afro-montane forests (much "patchier" than Exhibit 6 indicates) are the rarest.

In terms of species diversity, endemism, and deforestation threat, the afro-montane forests are of particular note. Unfortunately, there are no conservation units within this ecoregion.

**Exhibit 7. Simplified potential vegetation cover map of Angola**



## B2. The Human Environment

### B2a. Demographics and Quality of Life

Because there has not been a population census in Angola in more than 30 years, its size is unknown. Population estimates range from 16 to 18 million people (C. Theodoropoulos, senior protection officer, UNHCR) of whom more than 60 percent are believed to be less than 20 years of age. The average life expectancy is 42 years. While the spread of HIV/AIDS was contained during the war, the rate of infection is now



increasing. Child mortality extremely high: 250 of every 1,000 children younger than age five.

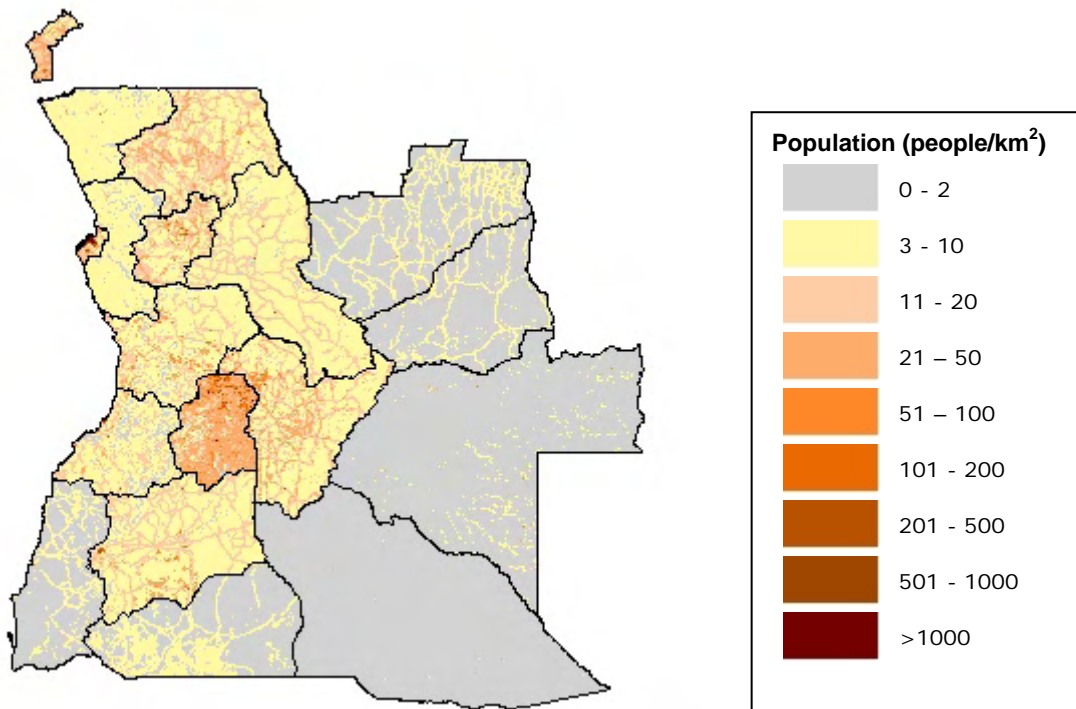
Angola's civil war had a profound impact on all aspects of social and economic life in the country. Approximately 4 million people were internally displaced and 600,000 left the country as refugees; of these, about 80 percent have since returned to Angola (UNHCR 2007). Most internal displacement was from rural to urban areas.

Whereas the expectations were that most people would settle back in the rural areas with the onset of peace (IUCN 1992), current trends indicate that the rural-urban migration continues. This is explained by the lack of basic services in rural areas, the lack of roads and economic opportunities, and reflects the fact that Angolan society lost much of its agricultural knowledge and tradition due to forced migration into urban centers and the collapse of the country's agricultural sector. Thus, the country is left with a sparsely populated countryside and congested urban centers. The existence of large population centers in Benguela, Lobito, Huambo, Lubango, N'dlatando, and Malanje, and the fact that Luanda's population alone (estimated at 5.5 million) is about one-third of the entire Angolan population, suggest that Angola is one of the most urbanized countries in Africa.

Exhibit 8 confirms this assertion. With the exception of the central plateau region — always one of the most densely populated areas in Angola — and urban areas, the bulk of the country supports population densities of less than 10 people per km<sup>2</sup>. The eastern half and southeastern corner are almost depopulated. This reflects not just the impact of the war, but also the inherently low soil fertility and limiting climatic conditions. The effect of the diamond industry is evident in the relatively high population along the rivers and in the northeast section of Lunda Norte. The forested zones of Uíge and Kwanza Norte, where the more fertile soils are found, also are areas of relatively high population.

Angola's economy is experiencing extraordinary growth. In 2006 its gross domestic product (GDP) grew by 18.6 percent, and projections for 2007 range from 27 percent to more than 30 percent. This unusual economic performance has yet to have a significant impact on poverty reduction. For example, the country's poverty reduction strategy states that 68 percent of Angolans live below the poverty level, 28 percent of them in extreme poverty. Unemployment in urban areas is almost at 50 percent. Access to basic social services is often impossible due to the limited and unbalanced distribution of the services across the country. The social indicators for Angola are consistently among the worst in the world; it ranks at position 161 on the UNDP Human Development Index.

Exhibit 8. Angola's population density (source: FAO, UNDP/GEF 2007)



## B2b. Economy

Oil and gas constitute more than 60 percent of Angola's GDP and 90 percent of its exports. More than a million barrels per day were produced in 2004, and the figure was expected to double by 2007. Diamonds are also important (around 9 percent of GDP). The contribution of other sectors, including agriculture, is secondary. It is estimated that in 2004 agriculture, forestry, and fisheries contributed a mere 8 percent to the GDP, with the main crops being maize, rice, cassava, potatoes, beans, bananas, sugar cane, and coffee.

It is likely, however, that the contribution of Angola's agricultural and fisheries sectors to the subsistence economy of rural households is crucial to their survival. It is also estimated that 80-90 percent of Angolans rely entirely on fuelwood or charcoal for their cooking and heating needs, and that fuel and charcoal use consumes approximately 6 million m<sup>3</sup> of wood products annually (FAO 2003, MINUA 2006a). This accounts for an estimated 65 percent of energy used in Angola. Field observations suggest that charcoal production and sales is the most important, and at times the only source of cash income for rural households. The estimate (UNDP/GEF 2007) that 100,000 people produce and sell charcoal is most likely an underestimate.

Both oil and diamond productions are expected to expand significantly. For example, the value of Angola's formal diamond production has increased from \$690 million in 2002 to more than \$1 billion in 2005 (PAC 2007). This increase may have serious environmental repercussions. Whereas oil companies tend to adhere to international environmental standards, Angola's diamond industry shows no such pretense.

### **B3. Legal Instruments Related to the Environment**

Most of Angola's legal framework pertaining to the environment dates back to the colonial era, is incompatible with Angola's status as an independent and democratic country, and does not incorporate the last four decades of advancements in conservation and environmental management thinking. Nonetheless, since the end of hostilities in 2002 there have been important advances in Angola's legal environmental framework. Below is a synopsis of key legal instruments pertaining to the environment.

#### **B3a. International Conventions**

Angola ratified several international conventions and protocols with a bearing on the environment. A selection of these is below (MINUA 2006b), with ratification dates:

- Convention on Biological Diversity (1998)
- United Nations Convention on the Law of the Sea (1990)
- International Treaty on Plant Genetic Resources, (2006)
- United Nations Convention to Combat Desertification (2000)
- Convention on the Conservation of Migratory Species (2003)
- Convention on International Trade on Endangered Species (CITES) (2001)<sup>6</sup>
- International Convention on Pollution Prevention by Ships (MARPOL 73/78)
- International Convention on Cooperation and Combat against (shipping) Pollution by Hydrocarbons
- United National Framework Convention on Climate Change (UNFCCC 2000)
- Kyoto Protocol (2007)

It is important to note that Angola is not a party to the Ramsar Convention on Wetlands, a significant omission since the country has some of the most important wetlands in Southern Africa. Furthermore, Angola has yet to produce its first greenhouse gas emissions national communication as required by the UNFCCC.

#### **B3b. African Conventions**

In addition to global treaties, Angola has signed the following continent-wide accords:

- The African Convention for the Conservation of Nature and Natural Resources
- The Lusaka Accord on concerted coercive measures against the illegal commerce of wild fauna and flora

#### **B3c. Southern African Development Conference Protocols**

At the Southern Africa regional level, Angola has signed the following protocols:

- Fisheries Protocol (signed, ratified, but not published)
- Protocol for the Conservation of Wildlife (signed but not ratified)
- Protocol on Forestry Activities (signed but not ratified)
- Protocol on Shared Water Resources (signed but not ratified)

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<sup>6</sup> Since the ratification and adoption of CITES has not yet been published in the Official Diary, its legal status is in limbo.

Of note is the lack of follow-through by the Angolan government towards the ratification and adherence to regional (SADC) agreements. In particular, the country has failed to ratify the SADC protocol on shared water resources.

### **B3d. Cross-Cutting Legal Instruments**

Angola is currently drafting a new constitution to replace its 1992 constitution; therefore, the legal instruments referred to in this report may be modified to align with the provisions in this new *carta magna*. Nonetheless, many of the articles in the current constitution will likely be carried over into Angola's new constitution.

Article 12 of the current constitution vests the property and responsibility over all natural resources to the state:

*“All natural resources existing in the soil and subsoil, in internal and territorial waters, on the continental shelf and in the exclusive economic zone shall be the property of the State, which shall determine under what terms they are used, developed, and exploited.*

*“The State shall promote the protection and conservation of natural resources by guiding the exploitation and use thereof for the benefit of the community as a whole.*

*“Land, which is by origin the property of the State, may be transferred to individuals or corporate bodies, with a view to sound and full use thereof, in accordance with the law.”*

Article 24 stipulates the rights of Angolan's citizens to a healthy environment and ascribes the responsibility of ensuring these rights to the state:

*“All citizens shall have the right to live in a healthy and unpolluted environment.*

*“The State shall take the requisite measures to protect the environment and national species of flora and fauna throughout the national territory and maintain ecological balance.*

*“Acts that damage or directly or indirectly jeopardise conservation of the environment shall be punishable by law.”*

The Angolan Environmental Framework Law (EFL) of 1998 is the overarching instrument for the implementation of the constitutional provisions. Article 13(1) prohibits “all activities that threaten the biodiversity, conservation, reproduction, quality, and quantity of biological resources ... especially those threatened with extinction.” Article 13(2) states that the government must ensure that adequate measures are taken to “maintain and regenerate animal species, recover damage habitat, and control, especially, the activities or substances likely to be harmful to animal species and their habitat.” Article 14(1) creates the legal basis for the establishment and maintenance of a network of protected areas and specifies that these may have a “national, regional, local, or international scope.” Finally, Article 12 bestows on the government the responsibility to “defend” the environmental patrimony through the involvement of communities and environmental defense associations among others. The EFL also establishes the need to conduct environmental impact assessments of activities

likely to negatively impact the environment, and gives any citizen that is negatively affected by environmental damage the right to take legal action against the perpetrator.

Ministerial Decree No. 51/04 on Environmental Impact Assessment regulates the stipulations of the EFL with respect to environmental impact assessments. It references but is vague about what public participation means. The process for validation and approval of the EIA is also unclear.

### **B3e. Water**

The Biological Aquatic Resources Act of 2004 is perhaps the most important piece of legislation relating to water resources. Some of its objectives are: to establish principles and rules for the protection of biological water resources and marine ecosystems; to promote the protection of the marine environment and coastal areas; and to establish principles and rules for responsible fishing. The act makes provisions for the protection of endangered aquatic species, the creation of marine and fluvial protected areas, setting fishing quotas, regulating fishing, and prohibiting damaging fishing methods, among others.

The Water Law, enacted in 2002, focuses on regulating the management and distribution of water resources. It establishes priorities and recognizes the responsibility of polluters to bear the costs of pollution.

### **B3f. Forests**

Angola's legal framework on forest resources is being developed with the assistance of the FAO. A forestry law has been drafted but has yet to be approved, and laws and regulations applicable to the forestry sector currently in use date back to colonial times. These are complemented by recent stop-gap measures, such as ministerial "orders."

As things stand, the Forest Regulation Decree No. 44.531 issued by the colonial government in 1962 is still the regulating document for the forestry sector. The decree is prescriptive and heavily weighed toward command and control measures. It created forest reserves with the objectives of conserving forests, regulating the hydrographic and climatic regimes, conserving flora with special scientific value or prone to extinction, and conserving and rehabilitating eroded soils.

Ministerial Order 149/00 issued by the MINADER in 2000 pertains to the licensing requirements and procedures for forest exploitation. It outlines the requirements and procedures for obtaining forest exploitation permits and attributes the responsibility for establishing the amount of timber to be extracted under permits to MINADER's Institute for Forestry Development Institute.

### **B3g. Protected Areas**

The establishment of protected areas (national parks, nature and forest reserves) was first mentioned in a colonial "regulation" in 1936, and the first protected area, Parque Nacional de Caça do Iona, was established in 1937. The first statute on nature conservation and on the establishment of protected areas — initially for hunting purposes and later for nature conservation — was issued on January 20, 1955 through Colonial Decree No. 40.040 (published in the Portuguese Official Bulletin on 9

February 1955). This decree covered aspects related to the protection of soil, fauna and flora, the conservation and use of game, the establishment of national parks, nature reserves, and controlled hunting areas. It created the Nature Conservation Council as the organization responsible for managing protected areas and developing conservation legislation. This legislative package included the Hunting, Forestry, and National Parks Regulations and included a list of mammals and bird species that were illegal to hunt.

Some of this legislation was revoked after independence by Decree No.43/77 of 5 May 1977. Nonetheless, in the absence of up-to-date legislation, some of colonial regulations are still in vogue.

Besides revoking selected legal instruments, Decree No. 43/77 approved the structure of the Ministry of Agriculture and defined five categories of protected areas; namely:

- *National park*. An area reserved for the protection, conservation, and propagation of wild animal life and indigenous vegetation, for the benefit and enjoyment of the public.
- *Strict nature reserve*. An area for the total protection of wild flora and fauna.
- *Partial reserve*. An area where it is forbidden to hunt, kill or capture animals, or to collect plants, other than for authorized scientific or management purposes.
- *Regional nature park*. An area reserved for the protection and conservation of nature, in which hunting, fishing, and the collection or destruction of wild animals or plants and the conduct of industrial, commercial or agricultural activities are prohibited or placed under limits.
- *Special reserve*. An area where the killing of certain species, whose conservation cannot be ensured in any other manner, is prohibited.

These categories do not cover the creation of community-managed conservation areas; nor do their definitions clarify specific conservation objectives.

Ministerial decree No. 41/89 created the Institute for Forestry Development (IDF) located within the Ministry of Agriculture and Rural Development (MINADER) and tasked the IDF with the development and enforcement of legislation on protected areas. The institutional problems created by this IDF mandate are discussed below.

In 1996 the MINADER issued an order establishing hunting seasons and listing the animals that could and could not be hunted. It is now illegal to hunt 28 mammals, 19 birds, and four reptile species, including the giant sable, manatee, giraffe, elephants, rhinos, penguins, cranes, turtles, and crocodiles.

### **B3h. Land Law**

A new Land Law (Law 9-04), which superseded previous land legislation, was enacted in February 2005. The Land Law considers land to be the property of the state and proposes the following land-use categories:

- Provide shelter and home for the inhabitants of Angola.
- Serve as a source of natural resources which can be used for mining, agriculture, forestry and land planning.
- Provide support for economic, agricultural and industrial activities.

The Land Law contains a number of environment-related articles and clauses:

- Article 10 states that all natural resources are state property and that the state's rights over the land are not transmissible.
- Article 14(b) establishes that the state can intervene in the management and concession of the land affected by the present Act. Two important objectives are the protection of the environment, and economically efficient and sustainable use of the land.
- Article 16 affirms that the occupation and use of the land depends on norms and standards for environmental protection, particularly relating to the protection of landscape, flora and fauna, the preservation of ecological equilibrium, and the right of citizens to a healthy and non-polluted environment. It further states that the occupation and use of the land shall not compromise its regenerative capacity or its ability to produce.
- Article 19 presents land classification for administrative purposes and affirms the right of the government to establish marine and terrestrial protected areas.
- Clause 70/1(a) recognizes that environmental organizations can play an important role in environmental protection.

### **B3i. Law on Geologic and Mining Activities (No. 1/92)**

From an environmental perspective the Law on Geologic and Mining Activities is important, in that it states in Article 13/03 that the competent authority may authorize “suspension of the activity when justified technically, economically, or in case of situations that are harmful to the environment.” The law further stipulates that mining license/concession holders must protect the environment, including “human health, vegetation, animals, soil, superficial and subterranean water, and other natural elements.” Unfortunately, this legal provision is largely ignored by diamond concession holders.

### **B3j. Legal Framework Pertaining to Petroleum Exploration and Extraction**

The Angolan National Oil Company (SONANGOL) is responsible for signing production sharing agreements with the oil companies. Government decree mandates that these agreements include a clause obligating the holder to “control and combat pollution situations caused by petroleum operations.” Furthermore, Decree No. 39/00 requires concession holders to elaborate environmental impact assessments of new installations, develop “spill response” and waste management plans, and stipulates that the concession holder must either remediate environmental impacts or compensate the state for damage.

### **B3k. Summary and Conclusions on Legal Framework**

Because the environment is cross-cutting, a number of different legal instruments impinge on it. A comprehensive treatise is out of scope for this document. Nonetheless, a few conclusions can be derived from this abbreviated analysis:

- The Angolan constitution recognizes the importance of the environment to the quality of life.

- Angola's legal environmental framework is transitioning from that of a colonial and war-torn past to that of a more modern state.
- Some legal instruments, particularly those pertaining to forestry and protected areas, are outdated.
- The legal framework recognizes the social role of protected areas.
- Angola is actively working on its environmental legislation.
- Regulations for the application of certain instruments (i.e., the Decree on Environmental Assessment) are lacking or deficient.
- The sectoral legislative and regulatory instruments related to oil and mining cater to the protection of the environment but are largely ignored by the mining sector.

#### **B4. Institutional Framework**

##### **B4a. Ministry of Urbanism and Environment**

The Ministry of Urbanism and Environment (MINUA), established at the end of 2002, is responsible for the formulation and execution of environmental policy. It also has a coordination role. MINUA's mandate is to:

- Promote and facilitate sustainable development in all sectors.
- Promote the elaboration of legislation related to the environment and natural resources utilization.
- Collaborate with other organisms in all actions inherent in the execution of projects that are related to the environment, ensuring adherence to environmental law.
- Promote and support environmental protection activities and stimulate the use of clean technologies by Angolan and foreign companies.

MINUA has two principal sub-structures: the National Directorate for the Environment (NDE) and the National Directorate for Natural Resources (NDNR). The NDE is responsible for environmental education, environmental planning, environmental policing, and development of environmental regulations. NDNR is in charge of protection of fauna, flora, and habitat, regeneration of degraded areas, and supporting the creation and management of conservation units.

While the EFL and MINUA's statutes give this institution jurisdiction over environmental matters, it has yet to fully assume its mandate. For example, the MINADER retains competencies related to forest management and biodiversity conservation, the Ministry of Fisheries has jurisdiction over aquatic biological resources, and the Ministry of Energy and Water has jurisdiction over hydrologic resources. Furthermore, given MINUA's relatively short existence, some of its units, such as the National Institute for the Conservation of Nature and the National Institute for the Promotion of the Environment, are not yet operational. MINUA has no presence in any protected area in the country, and is chronically understaffed, with 10 individuals in Luanda and virtually none outside the capital city. As a result, MINUA is unable to spend the more than \$40 million in its budget. In the meantime, Angola's entire protected areas system has been declared under threat (IUCN). While this situation persists, other ministries, such as MINADER, will continue to play an important role in addressing environmental concerns.



#### **B4b. Ministry of Agriculture and Rural Development**

The Ministry of Agriculture and Rural Development (MINADER) is still responsible for defining national forestry policy, promoting forestry research, and planning and directing all tasks related with forest resources management.

Currently, and in light of MINUA's limitations, the IDF exercises the mandate to manage forests and protected areas. The IDF is understaffed and under-equipped; however, its presence in protected areas is minimal, and its control of forest exploitation and timber transport and commerce is ineffective. The IDF does maintain an extensive network of control points along roadways and works in coordination with provincial level environmental authorities.

#### **B4c. Other**

In addition to MINUA and MINADER other ministries have a bearing on biodiversity conservation and environmental management. For example the Ministry of Energy and Water retain among its responsibilities the establishment of strategies and the coordination for the sustainable use of hydrologic resources. The Ministry of Fisheries is tasked with the definition of policy for the conservation of fisheries resources and for ensuring that the conditions exist for the protection and conservation of these resources. The Ministry of Fisheries is also supposed to collaborate in the conservation of nature, especially the conservation of the marine environment.

#### **B4d. Provincial Level Government Institutions**

There is no set provincial-level institutional structure for the environment that repeats itself from province to province. In most cases, however, the jurisdiction over environmental matters is ascribed to the Provincial Directorate for Agriculture Fisheries and Environment, which encompasses a provincial-level Department of Environment. This arrangement agglutinates in the directorate sectoral responsibilities of MINADER, MINUA, and the Ministry of Fisheries. In other cases, where provincial governments have established an Environment Department under a Directorate of Urbanism and Environment, the link to MINUA is clearer. Hence, a provincial government's decision how to organize itself determines support for environmental concerns.

#### **B4e. Cross-Sectoral Coordination**

To foster cross-sectoral coordination on environmental matters, the government created the Technical Multisectoral Commission for the Environment (CTMA) in 2000. The commission is supervised by MINUA and composed of technical representatives from selected sectoral ministries, technical representatives of provincial governments, guest specialists, and representatives of environmental organizations. The CTMA is a consultative body with the faculty to issue pronouncements on policies, programs, and actions related to the environment, and coordinate actions by different sectors that impinge on the environment.

#### **B4f. Conclusions on Institutional Framework**

The above discussion leads to the following conclusions about Angola's institutional environmental framework:

- Angola's institutional framework is undergoing a process of evolution and consolidation. This is particularly true of MINUA, the institution with overall responsibility for the environment. Nonetheless, the implementation structures are not yet set and the Ministry is chronically understaffed.
- There is a chronic lack of clarity as to the respective environmental responsibilities of certain sectoral ministries and MINUA. This is particularly serious with respect to the MINADER. In light of this lack of definition and poor institutional capacity, protected areas and environmental regulation chores are left unattended.
- There is some movement towards cross-sectoral coordination on environmental matters through the CTMA.

## **B5. International Cooperation**

### **B5a. Bilateral and Multilateral Donors**

Given Angola's post-conflict status, over the past five years the donor community centered its attention on the country's immediate needs: getting its agriculture sector back on its feet, reinserting ex-combatants into the economy, strengthening governance, repatriating refugees, and meeting health needs, among others. The focus is now beginning to shift, or broaden, to include issues of sustainability; among them environmental management and conservation.

For example, in February 2008 the German Technical Cooperation Agency (GTZ) signed a two-year, \$2 million agreement with the GOA to provide capacity building on different aspects of conservation and environmental management. One aspect of the agreement is training ex-combatants to become park guards. The GEF has signed a \$1.9 million agreement with the government to increase sustainable land management capacity in Huambo Province. Finally, while conducting interviews in Luanda the team learned that the European Union, the Netherlands, Sweden, and Norway are considering including the environment in their assistance portfolio.

The United Nations Food and Agriculture Organization is a key player in the development of the forestry policy and proposed forestry law. FAO, supported by the Netherlands, is conducting a forestry inventory and developing the regulatory framework for wildlife (hunting), conservation areas, forestry, and monitoring.

The UNDP is developing a project to support the implementation of the National Biodiversity Strategy and Action Plan. One of the components will establish an implementation unit within MINUA.

At the regional level, the GEF provides \$5 million to FAO, in coordination with the Okavango River Basin Water Commission (OKACOM), for a project aimed at improving management and utilization of resources in the Okavango River Basin.

In short, there is a clear indication that donor-interest on environmental issues in Angola is on the upswing. There are a number of initiatives under development and a clear enunciation by certain donors that they are prepared to fund environmental activities.

## **B5b. Extractive Industries**

The financial support of extractive industries to environmental activities has been small but significant. Esso (Exxon) is a key supporter of the Giant Sable Conservation Project, to which it donated approximately \$50,000. SONANGOL supports the Kissama Foundation's effort to save the Kissama National Park, and donated \$300,000 to help fund the erection of an electric fence, reintroduce a number of species from South Africa, and pay the salary of a park manager. British Petroleum funds research on the impact of platforms on the deep sea environment and environmental education.

Investments by oil companies from Angola-derived revenue on development assistance projects in Angola must be approved by SONANGOL, because any investment in non-oil related activities detracts from the bottom line. This is not the case, however, if the funds are provided from company funds from outside the production sharing agreements.

The petroleum industry has provided some assistance towards very specific environmental management and conservation activities. The magnitude of the assistance, however, is small relative to the size of their operations in Angola. The team found no evidence that the mining industry is contributing to conservation in Angola, beyond that which is required by law.



## SECTION C. THE STATUS AND ECOLOGICAL TREND OF TROPICAL FORESTS AND BIODIVERSITY

### C1. Protected Areas

There are 20 protected area units in Angola (Exhibit 9). These cover approximately 68,000 km<sup>2</sup>, or about 6 percent, of the national territory, the lowest percentage of any African country. These areas are divided in Angola's National Biodiversity Strategy and Action Plan (NBCSAP; MINUA 2006) into four broad categories: national parks, regional parks, reserves, and game reserves. Judging from the definitions of the different categories of protected areas presented in section B3g, the legal conservation significance of this classification is unclear.

**Exhibit 9. Angola's protected areas**

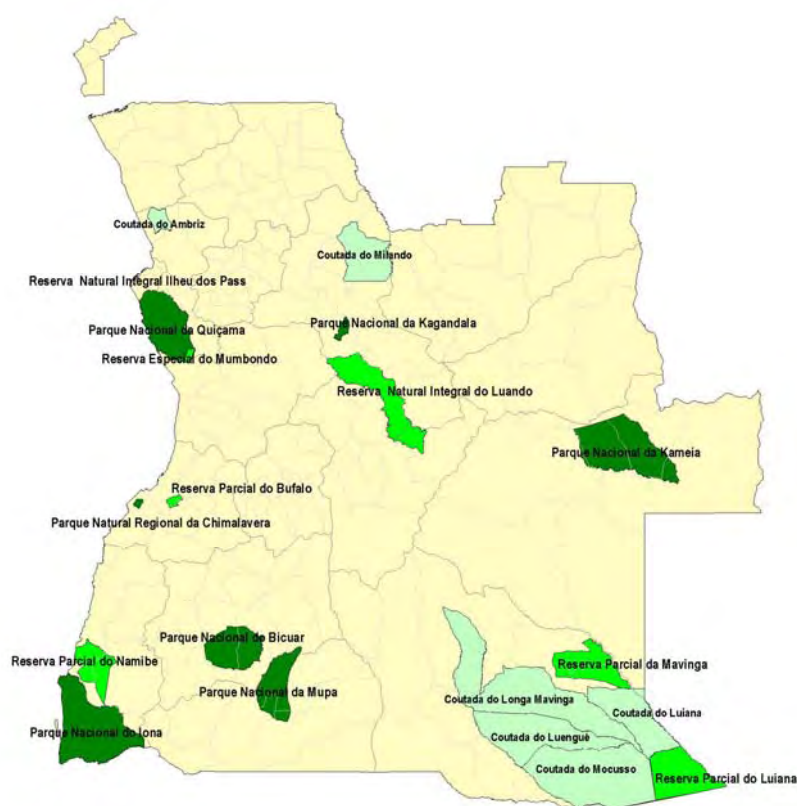


Exhibit 10 summarizes the worrisome condition of Angola's national parks. Of Angola's six national parks, only three — Kissama, Cangandala, Bicular — have even a minimal degree of management. The national authority responsible for managing these areas (MINUA) is virtually absent from all areas. What management there is in these three areas is a result of specific initiatives that could collapse without the tenacity of certain key individuals. Some areas, such as Mupa National Park, are believed to be beyond recovery.

Although there is limited information about the condition of the other categories of protected areas, it is safe to assume that their situation is more precarious than that of the national parks.

**Exhibit 10. The situation in Angola's national parks**

National Park	Area (ha)	Dominant Vegetation Types	Current Status (general)	Management Status	Major Threats
Kissama	969,000	Semi-arid Baobab savannas, mangroves, wetlands	Vegetation in good condition, fauna severely depleted.	Small northern section (10,000+ ha) under-administration by Kissama Foundation. Minimal presence in rest of park. Re-introduction of selected species managed within enclosure.	Development in park (shrimp farming), encroachment, cultivation in wetlands, oil production, livestock grazing, charcoal production
Cangandala	63,000	Miombo and edaphic (poorly drained) savannas	Vegetation in excellent condition. Fauna seriously depleted but residual number of large (roan) and small (duiker) antelopes persist. Important population (30+) of giant sable ( <i>Hippotragus niger</i> ) persists.	Park benefiting from Giant Sable project. Community guards patrol park on regular basis. Catholic University of Angola, the Ministry of Environment, and the Provincial Government of Malanje.	Poaching, human encroachment/agriculture, charcoal production.
Iona	1,600,000	Namib Desert, sparsely vegetated gravel plains and plateaus, scrubland, dunes and extensive beaches, gravel plains. <i>Welwitschia mirabilis</i> habitat	Desert elephant ( <i>Loxodonta Africana</i> ), black rhino ( <i>Diceros bicornis</i> ), desert lions ( <i>Panthera leo</i> ) presumed extinct. Oryx ( <i>Oryx gazelle</i> ) and springbok ( <i>Antidorcas marsupialis</i> ). Zebras present in residual numbers.	Absent	Livestock grazing, poaching
Bicuar	740,000	Miombo and Mopane woodlands crisscrossed by ephemeral drainage lines	Previously known for large herds of common antelopes (elephant); roan ( <i>Hippotragus equinus</i> ); eland ( <i>Taurotragus oryx</i> ); Kudu ( <i>Tragelaphus strepsiceres</i> ); wildebeest ( <i>Connochaetes taurinus</i> ); and some rare species (wild dog). All species populations believed to be severely reduced.	Incipient collaborative effort between Provincial Government of Huila and MINUA to establish management.	Poaching, human encroachment, commercial farming within park limits, illegal logging.
Mupa	560,000	Mopane woodlands	Established to conserve Angola's Giraffe ( <i>Camelopardalis angolensis</i> ) believed to be extinct in wild. Species previously present (black rhino, hippopotamus ( <i>Hippopotamus amphibious</i> ), eland, kudu, and predators believed to be locally extinct. Large sections believed to be beyond recovery.	Absent	Invasion by refugees; poaching; human encroachment; subsistence agriculture; commercial farming along the Cunene River; charcoal; logging.
Cameia	1,400,000	Extensive grasslands and periodically inundated grasslands	Had large herds of migratory animals (wildebeest) and animals adapted to flooded areas such as sitatunga ( <i>Tragelaphus spekei</i> ) and red lechwe ( <i>Kobus lechwe</i> ) among many others. All believed to be severely reduced.	Absent	Poaching, human encroachment, fires, and uncontrolled fishing.

It is important to note that Angola's protected area "system" does not include some of the most biodiverse ecosystems in Angola: the afro-montane cloud forests represented in the country's highest points, such as the Morro do Moco in Huambo, and other sites in Bié Province. These residual patches are repository of a significant number of bird and plant species endemic to Angola. They are severely threatened by burning and felling.

The semi-deciduous humid forests of Angola's northwestern highland (Uíge, Cuanza Norte, and Bengo) are also excluded from the country's protected area system. Floristically, they are related to the Guineo-Congolian biome in what was Angola's coffee producing area. These coffee plantations have been abandoned and now support a healthy population of small antelopes, primates, and an impressive avifauna. The wildlife, primarily primates and antelopes, are under heavy hunting pressure as witnessed by the large number of fresh carcasses and smoked game meat observed at roadside stalls.



**Antelopes and primates that escaped the period of warfare in Angola's humid forests are now under hunting pressure, primarily for commercial purposes, as documented by the photograph in the highlands of Bengo Province.**

## **C2. Forests, Savannas, and Woodlands**

### **C2a. General**

In three decades of warfare, Angola experienced massive population movements from rural areas to urban centers. IUCN's mission in 1992 (IUCN 1992) reported that the virtual depopulation of rural areas, save for certain zones in the Central Plateau, allowed the vegetation cover, rivers, and streams to recover in areas that were once cultivated or used for livestock production. Poaching, however, had decimated animal populations in most of the country. On the other hand, the semi-arid and arid regions in the country's southwest, where the dominant production system is transhumant pastoralism, escaped this trend. In these areas the production systems remained relatively unaffected while the urban areas and transport network were destroyed. These pastoral systems were being compromised, however, by the implementation of cattle ranches that interfered with migratory routes and access to water resources.

Now, five years after the cessation of hostilities the situation remains much the same: healthy habitats virtually devoid of wild animals. The trends have not changed substantially, as predicted by the IUCN team; a result of the massive movement of people to their original rural areas. Angola continues to be one of the most urbanized

countries in Africa, with at least 60 percent of its population living in urban and peri-urban areas. The problem results in increasing demand from urban centers for vegetation resources.

### **C2b. Deforestation Rates**

In a paper prepared as part of this assessment, Safford (2000) cites estimates for deforestation rates ranging from 0.2 percent to 0.5 percent. He noted that these are not based on hard data and attempts to provide a more realistic figure based on estimates of charcoal and firewood demand in Angola.

Assuming a demand of slightly more than 9 million m<sup>3</sup> of wood for charcoal production to satisfy the energy needs of 80 percent of Angola's population, and estimates of wood volume extracted from the literature, Safford estimates that deforestation rates due to wood extraction for charcoal alone is probably between 0.9 percent to 1.0 percent per year. This is concentrated around urban areas in ever widening circles of deforestation. With the rehabilitation of the road network, the area of extraction is likely to expand unless drastic measures are put in place to replace the primary source of energy used by Angolan households, from charcoal and firewood to something else.

In addition to deforestation resulting from charcoal and firewood extraction, Safford calls attention to the impact of slash-and-burn cultivation on vegetation cover, especially where soil fertility is limiting. Based on Angola's rural population density, and the time it takes the soil to recover, Safford arrived at the following conclusions:

1. Population growth in Angola is rapid enough that sustainable slash-and-burn cultivation cannot supply enough food to feed the rural population.
2. Over the short- to medium-term, more people can be supported in rural areas when fallow periods are shortened, and/or if the rate of new clearing is increased.
3. As seen in other southern African nations, short-term needs for food will probably increase current rates of forest-clearing for cultivation to the point that soil fertility and forest cover will be negatively impacted in the long-term.



**Charcoal production is one of the most important forces driving deforestation. As the radius of deforestation expands out from urban centers, it threatens protected areas. This photograph was taken a few kilometers from the boundary of Cangandala National Park, one of the last refuges of the giant sable.**



### C3. Coastal and Marine Systems

#### C3a. General

Angola's mangroves, estuarine systems, and coastal zones in general are under a number of pressures due their proximity to population centers and irregular settlements established during the war. These were described by IUCN in 1992; now, peace and rapid economic growth in the absence of effective environmental governance compromise the future of some of the most productive coastal ecosystems in the country, such as the Kwanza and Longa River mouths, and other estuaries and bays near urban centers.



**Angola possesses some of the most impressive mangroves in Africa. These ecosystems, such as this one in Kissama National Park, are under a number of threats such as deforestation and the hunting of keystone species.**

The discussion below focuses on a few areas along Angola's extensive coastline. The examples illustrate the status and trends affecting coastal ecosystems in the country, but are far from comprehensive.

#### C3b. The Status of Selected Bays, Estuaries, and Coastal Strips

*Cacuaco Bay* is 15 km north of Luanda. In 1992 IUCN noted that the bay was severely impacted by human wastes from squatter camps, shanty towns, and industrial wastes from Angola's largest cement factory (CIMANGOL), the SONANGOL oil refinery, and an asbestos tubing and sheet factory (CIMIANTO), among others. These continue to operate and pollute.

*Luanda Bay and Environs* is Angola's principal port and shipyard. Ships using the bay have significant negative impacts as they wash out bilges in or near the bay. Maintenance work on hulls, including the application of molluscicidal paints, is occurs without controls. Given the increase in Angolan imports and ship traffic, the problems caused by the shipping industry are likely to have augmented since 1992. Storm water from Luanda discharges directly into the bay carrying with it human waste from broken sewage pipes. Luanda Bay is also experiencing pressures along its southern shoreline from mega-development projects that include extensive earth-filling.

*Mussulo Bay* is under pressure from artisanal fishing, tourism development, and settlements along its shoreline. Fishing has had a serious impact on turtle populations. Raw untreated sewage is certain to lead to eutrophic contaminated conditions.

*Estuaries and mangrove* ecosystems are under pressure from wood extraction and heavy poaching of manatees. There are also international (Chinese) interests looking at mangroves within protected areas as potential sites for shrimp farms. The Kissama Foundation stopped one such attempt in Kissama National Park, but the Chinese company continues to pressure local officials. More important, however, are plans for the construction of several hydroelectric facilities along the Kwanza River<sup>7</sup>. If not properly constructed and operated, these may have a dramatic impact on coastal mangrove ecosystems.



**Mangroves, such as this one at the mouth of the Kwanza River, are under pressure. The plan for large upriver development projects and overuse of key species threatens the ecological health of these highly productive ecosystems.**

One of the few original ecological studies conducted since 1975 in Angola looked at the status of the manatee populations and habitat in the Kwanza estuary (Morais, et al. 2007). Although centered on the Kwanza, the results of the study are likely to reflect the situation in other mangrove ecosystems such as the ones associated with the rivers Zaire, Loge, Onzo, Dande, Bengo, and Longa.

Most of the human population now residing along the lower reaches of the Kwanza originate from other parts of the country and have neither knowledge of nor cultural attachment to the estuarine ecosystems. Almost everyone interviewed had consumed manatee meat at least once. The original residents indicated that “before” they expected to see a manatee once every other outing (50 percent), whereas now the chance of sighting a manatee is less than 10 percent. Most attribute this decline to

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<sup>7</sup> The team heard of 11 such structures but was unable to confirm the number or magnitude.

indiscriminate hunting. Other negative trends documented included the reduction in the cover of mangroves and pollution.

## C4. Threatened Species

### C4a. Data Limitations

Information on the status of Angola’s plant and animal species should be regarded with a dose of skepticism for two reasons. First, there have been no significant taxonomic studies in the country for nearly four decades. In this period, taxonomists elsewhere have recognized new species and subspecies and eliminated others based on new taxonomic techniques and criteria. Second, there have been no significant field studies or surveys since 1975 to establish the actual status of different species in country. What we know today about Angola’s biodiversity is actually less than what was known in 1975 when Angola achieved independence.

Nonetheless, even the outdated information leads to the conclusion that Angola is one of the most biodiverse countries in Africa. This is a result of its diverse climate, topography, edaphology, marine currents, and extensive coastline and network of rivers and streams.

### C4b. Species Diversity

According to IUCN (1992), Angola is home to at least 8,000 plant species, 275 mammal species, 78 amphibian species, 227 reptile species, and 915 bird species. The number of insect species catalogued exceeds 300, but the total number is likely to be considerably higher.

Angola reputedly has the second highest number of endemic plant species in Africa (1260). It hosts 10 endemic bird (Exhibit 11) and 19 endemic reptile species. The country’s two most famous endemics are the prostrate conifer (*Welwitschia mirabilis*) and the giant sable antelope (*Hippotragus Niger variani*).

**Exhibit 11. Bird species known to be endemic to Angola**

Scientific Name	Common English Name	Common Portuguese Name
<i>Francolinus griseostriatus</i>	Grey-striped Francolin	Perdiz de estrias cinzentas
<i>Francolinus swierstrai</i>	Swierstra’s Francolin	Perdiz da montanha
<i>Tauraco erythrolophus</i>	Red-crested Turaco	Turaco-de-crista-vermelha
<i>Colius castanotus</i>	Red-backed Mouse Bird	Rabo de jungo de rabadilha vermelha
<i>Sheppardia gabela</i>	Gabela’s Akalat	Tordito da Gabela
<i>Xenocopsychus ansorgei</i>	Angola Cave Chat	Tordo das furnas
<i>Mecrosphenus pulitzeri</i>	Pullitzer’s Longbill	Rouxinol de pulizer
<i>Melaenornis brunneus</i>	Angolan Fly Catcher	Papa-moscas de Angola
<i>Platysteira albifrons</i>	White-fronted Wattle-eye	Olho de curruncula de testa branca
<i>Prionops gabela</i>	Gabela Helmet Shrike	Atacador de popa da Gabela

A search of IUCN’s Red List for vulnerable (VU), endangered (EN), critically endangered (CR) and extinct species yielded 88 species of plants and animals (Exhibit 12) in these categories in Angola. Interestingly, the search did not capture the giant sable or *Welwitschia mirabilis*. It also left out six of the 10 endemic species of birds

whose afro-montane forest habitat is under serious threat. These omissions are a clear illustration of the lack of updated information on the status of biodiversity in Angola.

Furthermore, not only are certain threatened species omitted from IUCN’s Red List, but some are given a status that clearly understates the threats. For example, there is a strong likelihood that the African wild dog, ranked EN, is either critically endangered or extinct in Angola. Given the pressures, the African manatee, listed as “vulnerable,” is likely close to extinction in Angola unless decisive action is taken to conserve it and its habitat.

In spite of its problems when applied to Angola, IUCN’s Red List provides solid ground on which to set priorities for habitat and species conservation. For example, the list calls attention to the plight of the black rhino — ranked CR but probably extinct in Angola — the chimpanzee, the lowland gorilla, three species of turtle (green, leatherback, olive ridley) and nine endangered species of bird, of which four are endemic to Angola. This indicates conservation efforts aimed at Angola’s humid forests that serve as habitat for the two large primates, and efforts to conserve turtle nesting sites and the afro-montane forests that serve as habitat for endemic bird species. It also suggests an effort to determine the status of Angola’s rhino population.

**Exhibit 12. Threatened plant, bird, fish, and mammal species in Angola**

Common Name	Scientific Name	Status
<b>Mammals</b>		
AFRICAN ELEPHANT	<i>Loxodonta africana</i>	VU
AFRICAN GOLDEN CAT	<i>Profelis aurata</i>	VU
AFRICAN LION	<i>Panthera leo</i>	VU
AFRICAN MANATEE	<i>Trichechus senegalensis</i>	VU
AFRICAN WILD DOG	<i>Lycaon pictus</i>	EN
BLACK RHINOCEROS	<i>Diceros bicornis</i>	CR
HUMPBAC WHALE	<i>Megaptera novaeangliae</i>	VU
CHEETAH	<i>Acinonyx jubatus</i>	VU
CHIMPANZEE	<i>Pan troglodytes</i>	EN
HIPPOPOTAMUS	<i>Hippopotamus amphibius</i>	VU
FIN-BACKED WHALE	<i>Balaenoptera physalus</i>	EN
LOWLAND GORILLA	<i>Gorilla gorilla</i>	CR
MOUNTAIN ZEBRA	<i>Equus zebra</i>	EN
<b>Plants</b>		
RAPHIA PALM	<i>Raphia regalis</i>	VU
AFRICAN MAHOGANY	<i>Khaya ivorensis</i>	VU
WHITE MAHOGANY	<i>Khaya anthotheca</i>	VU
AFRICAN PEARWOOD	<i>Baillonella toxisperma</i>	VU
AFRICAN WALNUT	<i>Lovoa trichilioides</i>	VU
ALBIZIA	<i>Albizia ferruginea</i>	VU
CEDAR KOKOTI	<i>Entandrophragma candollei</i>	VU
RED STINKWOOD	<i>Prunus africana</i>	VU
SAPELE	<i>Entandrophragma cylindricum</i>	VU
WHITE AFZELIA	<i>Afzelia pachyloba</i>	VU
Common name not listed	<i>Afzelia bipindensis</i>	VU
Common name not listed	<i>Amanoa strobilacea</i>	VU
Common name not listed	<i>Brachystegia bakeriana</i>	VU
Common name not listed	<i>Calochone acuminata</i>	VU
Common name not listed	<i>Crotalaria bamendae</i>	VU
Common name not listed	<i>Entandrophragma angolense</i>	VU

Common Name	Scientific Name	Status
Common name not listed	<i>Entandrophragma utile</i>	VU
Common name not listed	<i>Gossweilerodendron balsamiferum</i>	EN
Common name not listed	<i>Gossweilerodendron joveri</i>	VU
Common name not listed	<i>Hallea ledermannii</i>	VU
Common name not listed	<i>Hallea stipulosa</i>	VU
Common name not listed	<i>Mikaniopsis vitalba</i>	VU
Common name not listed	<i>Nauclea diderrichii</i>	VU
Common name not listed	<i>Swartzia fistuloides</i>	EN
Common name not listed	<i>Tapinanthus preussii</i>	VU
Common name not listed	<i>Turraeanthus africanus</i>	VU
<b>Reptiles</b>		
AFRICAN DWARF CROCODILE	<i>Osteolaemus tetraspis</i>	VU
GREEN TURTLE	<i>Chelonia mydas</i>	EN
LEATHERBACK	<i>Dermochelys coriacea</i>	CR
OLIVE RIDLEY	<i>Lepidochelys olivacea</i>	EN
<b>Fish</b>		
BIGEYE TUNA	<i>Thunnus obesus</i>	VU
DUSKY GROUPE	<i>Epinephelus marginatus</i>	EN
GREENHEAD TILAPIA	<i>Oreochromis macrochir</i>	VU
QUEEN TRIGGERFISH	<i>Balistes vetula</i>	VU
THREESpot TILAPIA	<i>Oreochromis andersonii</i>	VU
AFRICAN WEDGEFISH	<i>Rhynchobatus luebberti</i>	EN
ANGULAR ROUGH SHARK	<i>Oxynotus centrina</i>	VU
BLACKCHIN GUITARFISH	<i>Rhinobatos cemiculus</i>	EN
BOTTLENOSE SKATE	<i>Rostroraja alba</i>	EN
COMMON GUITARFISH	<i>Rhinobatos rhinobatos</i>	EN
COMMON SAWFISH	<i>Pristis pristis</i>	CR
GREAT WHITE SHARK	<i>Carcharodon carcharias</i>	VU
GULPER SHARK	<i>Centrophorus granulosus</i>	VU
LARGETOOTH SAWFISH	<i>Pristis perotteti</i>	CR
LIVER-OIL SHARK	<i>Galeorhinus galeus</i>	VU
MONKFISH	<i>Squatina aculeata</i>	CR
MONKFISH	<i>Squatina oculata</i>	CR
NIGHT SHARK	<i>Carcharhinus signatus</i>	VU
WHITE-TIPPED SHARK	<i>Carcharhinus longimanus</i>	VU
WIDE SAWFISH	<i>Pristis pectinata</i>	CR
WHALE SHARK	<i>Rhincodon typus</i>	VU
<b>Birds</b>		
AFRICAN PENGUIN	<i>Spheniscus demersus</i>	VU
YELLOW-NOSED ALBATROSS	<i>Thalassarche chlororhynchos</i>	EN
BLACK-BROWED ALBATROSS	<i>Thalassarche melanophrys</i>	EN
CAPE GANNET	<i>Morus capensis</i>	VU
EGYPTIAN VULTURE	<i>Neophron percnopterus</i>	EN
GABELA AKALAT	<i>Sheppardia gabela</i>	EN
GABELA BUSH-SHRIKE	<i>Laniarius amboimensis</i>	EN
GABELA HELMET-SHRIKE	<i>Prionops gabela</i>	EN
LAPPET-FACED VULTURE	<i>Torgos tracheliotos</i>	VU
LESSER KESTREL	<i>Falco naumanni</i>	VU
LOANGO WEAVER	<i>Ploceus subpersonatus</i>	VU
ORANGE-BREASTED BUSH-SHRIKE	<i>Laniarius brauni</i>	EN
PULITZER'S LONGBILL	<i>Macrosphenus pulitzeri</i>	EN
SWIERSTRA'S FRANCOLIN	<i>Francolinus swierstrai</i>	VU
TRISTAN ALBATROSS	<i>Diomedea dabbenena</i>	EN

Common Name	Scientific Name	Status
WATTLED CRANE	<i>Grus carunculatus</i>	VU
WHITE-HEADED ROBIN-CHAT	<i>Cossypha heinrichi</i>	VU
WHITE-HEADED VULTURE	<i>Trigonoceps occipitalis</i>	VU

CR = Critically Endangered, EN = Endangered, VU = Vulnerable

### C5. Diamonds and Rivers

As reported in the IUCN (1992) report, Angola's rivers were in good condition in 1992. Save for areas near urban centers and selected estuaries, this is still the situation in most of Angola with one serious exception: the rivers in the diamond producing areas, especially in Lunda Norte, particularly the Cuango River.

Mining practices in Angola show no regard for the environment. To mine diamonds from riverine alluvial deposits, the mining companies, with the acquiescence of ENDIAMA, move the river into artificial channels and use high pressure hoses to wash and sift the alluvium in the original channel for diamonds. The long-term environmental impacts are drastic and, in a time scale relevant to humans, irreversible. There are no measures to avoid, mitigate, or reverse the impact of diamond mining. In the words of one high-ranking ENDIAMA official, "If it is between money and the environment, money wins." Public relations material displayed on ENDIAMA's office wall reflect this attitude: they proudly display photographs of large earth moving equipment amid ravaged landscapes.

The north-flowing diamond bearing rivers in Lunda Norte are fringed by gallery forests that have species composition representative of the Guineo-Congolian biome, in sharp contrast with the surrounding dystrophic savannahs and woodlands that dominate the landscape on the region. From a biodiversity conservation perspective, they are far more important than their relatively small extension suggests.

## **SECTION D.CAUSES OF ENVIRONMENTAL DEGRADATION**

### **D1. Principal Root Causes of Angola's Environmental Problems**

#### **D1a. Rapid Economic Growth in the Absence of an Adequate Institutional and Regulatory Framework**

Angola is emerging from a protracted war during which its economy was debilitated and its infrastructure destroyed. The current emphasis on rehabilitating the country's infrastructure, productive apparatus, and basic social services provision is understandable. The environment, and future repercussions of environmental mismanagement, is currently not a priority.

With its vast reserves of oil and diamonds, Angola has the financial wherewithal to rehabilitate its infrastructure and stimulate economic growth. In 2007, Angola's economy grew an estimated 30 percent, the fastest economic growth rate in the world.

In the absence of significant industrial capacity outside the oil sector, construction assumes an important role as an employment generator. Foreign construction companies, primarily Chinese, Brazilian, and Portuguese, are busy building new airports, roads, hydroelectric power plants, and large buildings. One Brazilian construction company lists more than 32 large ongoing projects in its Web site, among them an irrigation project of more than 7,000 ha that includes a 40-km canal, an agribusiness project of 33,000 ha in the scenic Pungo Andongo area, three diamond mining concessions (alluvium and kimberlites) in Lunda Norte, and a number of roads and hydroelectric power plants. A Chinese company recently obtained permission to develop a large shrimp farm within the Kissama National Park, although the Kissama Foundation has blocked this project for the time being.

All of this is taking place in an environmental regulatory vacuum. More worrisome, this regulatory vacuum is subtended by an environmental consciousness void on the part of key decision makers, whose focus is on economic growth at all costs. Hence, MINUA is well-funded but understaffed, and the clarification of institutional environmental responsibilities takes a back seat to more visible and lucrative matters.

This situation leads to the conclusion that the country's vertiginous economic growth in the absence of an institutional and regulatory framework to ensure that the environmental impact of economic activities are incorporated into development planning and implementation is a root cause of environmental degradation and biodiversity loss.

The problem is compounded by Angola's economic growth: while the export of non-renewable resources fills government coffers, the construction frenzy that this situation fuels cannot meet the employment needs of poorly trained Angolans. Hence, while Angola is the second producer of oil in Africa after Nigeria, and its economy is growing at a vertiginous pace, 70 percent of Angolans live on less than \$2 per day. This situation leaves large segments of the population with reduced livelihood options, among them the unsustainable exploitation of Angola's vegetation and wildlife.

## **D1b. Reduced Economic Alternatives and Ill-defined Property Rights Lead to Unsustainable Exploitation of Renewable Resources**

According to some estimates, unemployment and underemployment affect nearly 50 percent of the Angolan population. There are few alternatives for a large proportion of the population but to eke a living out of the exploitation of natural resources: producing and selling charcoal; poaching wild animals for subsistence and commercial purposes; and illegal logging of valuable timber. Uncontrolled use and unclear resource and land tenure regimes, which render wildlife, land, and trees free-access resources, compound the situation. Limited economic options available for nearly 50 percent of Angola's population, and their ability to freely exploit renewable natural resources is a root cause for the unsustainable exploitation of these resources and the demise of the country's biodiversity, forests, and aquatic resources.

## **D2. Immediate Causes to Specific Environmental Problems**

### **D2a. Deforestation as a Result of Charcoal Production and Fuelwood Extraction**

The primary source of energy for an estimated 80 percent of Angola's households is charcoal and fuelwood. This creates a demand for these resources and promotes widespread deforestation by individuals who sell them to earn a living. Charcoal production is generating an ever-widening circle of deforestation around urban centers, a process that is facilitated by the unclear resource tenure regime that predominates in Angola's rural areas. Hence, the principal direct cause of deforestation is charcoal production, which is subtended by a demand for fuel by urban and rural households and a lack of alternative sources of income for urban and rural dwellers. The substitution of natural gas for charcoal in cooking would go a long way toward resolving this problem.

### **D2b. Depletion of Wildlife Populations in Forested Areas as a Result of Commercial Hunting**

In three decades of war, large segments of Angola's population preyed on wildlife as a source of sustenance. This led to the decimation of wildlife populations in savannah areas. Only residual populations exist from the estimated 200,000 buffalo, 35,000 zebras, 70,000 elephants, 15,000 hippopotamus, and 200,000 antelopes that populated Angola's protected areas before independence (MINUA 2006c).

Whereas Angola's wildlife populations from savannah areas entered the post-war period in a critically depleted state, the large number of freshly killed carcasses for sale along roads in the country's northern humid forests (Bengo, Uíge) attest to the existence of healthy populations of small antelopes (duikers, bush buck) and primates in those areas. The survival of these species in forested ecosystems is threatened by the heavy hunting pressure that emerged with the advent of peace. Therefore, poaching for commercial purposes threatens populations of primates and small antelopes in Angola's northern forest areas. Poaching is a relatively easy source of cash in a country with limited employment possibilities.



### **D2c. Degradation of Coastal Ecosystems, Particularly Mangroves, Due to Deforestation and Hunting of Keystone Species**

During the war, large numbers of people flocked to coastal areas to escape the violence and have access to sources of protein. Mangroves, a highly productive ecosystem, were particularly attractive, as displaced people fished and extracted wood for construction and fuel. Given the ease with which they can be hunted and the amount of meat they yield, the African manatee became a favorite prey. The pressure extended to marine turtles; people raided nests and occasionally butchered adults.

Internally displaced people have not returned to their places of origin as expected. Many that settled along coastlines have elected to stay. The team saw evidence that the movement of people towards coastal areas continues, albeit at a reduced rate. The pressure on coastal resources, particularly mangroves, continues unabated. Hence, in the absence of effective controls, the harvest of wood and the killing of keystone species such as the African manatee are degrading mangrove ecosystems. The survival of marine turtles (leatherback, olive, and green) that use Angola's coastline is in jeopardy due to raiding of nests and killing of adult females.

### **D2d. Absence of Controls Renders Angola's Protected Areas Vulnerable to Poaching, Deforestation, and Encroachment**

Angola's protected areas are in critical condition. There is practically no effective government control in any of the six national parks. Where there is some management, it is a result of specific projects catalyzed by the initiative of individuals or national NGOs. This lack of control makes it easy for poachers, charcoal producers, and livestock herders to practice their trade within park boundaries. Foreign interests, with the acquiescence of local authorities, have plans to establish large development projects (shrimp farms, hotels) within some park boundaries. Other parks have been encroached upon by large farms and small scale agricultural producers. In short, the absence of government controls or presence in protected areas renders these areas vulnerable to a broad spectrum of pressures. Unless the situation is reversed in the short term, many of Angola's protected areas will become unviable as conservation units.

### **D2e. Lack of Legal and De Facto Protection Renders Angola's Centers of High Biodiversity and Endemism Highly Vulnerable**

Angola's afro-montane forests are not represented in the country's system of protected areas. In 1992 IUCN reported that they were under intensive pressure from fires and cultivation. These areas are habitats for several species of endemic birds and plants. Furthermore, Angola's northwestern forested areas, once used as coffee farms, are now areas of high biodiversity. Neither of these ecosystem types are represented in Angola's protected areas system. Because Angola's most biodiverse ecosystems are not represented in the country's system of protected areas, they are seriously threatened. Whereas legal protection does not ensure the conservation of habitats or species in Angola, a legally recognized conservation category does offer the hope that the practical problems can be solved and conservation achieved.

## **D2f. Inadequate Support, Poaching, and Habitat Encroachment Threaten the Survival of Angola's National Symbol: the Giant Sable**

The giant sable, Angola's national symbol and its most charismatic and famous endemic is on the brink of extinction. Through the Giant Sable Conservation Project, biologist Pedro Vaz Pinto is studying a giant sable population of approximately 30 individuals in Cangandala National Park. The project receives financial assistance from Exxon and other occasional donors, and collaboration from the IDF and MINUA. The project's principal element is a community park guard program. Mr. Pinto believes that there is a larger, unprotected giant sable population in Luanda Reserve, to the south of Cangandala.

The many pressures on Cangandala include its proximity to the expanding circle of deforestation, now within a few kilometers of its boundaries. More families are beginning to settle in the park's vicinity. Cangandala is in an area of infertile soils and cultivators practice slash-and-burn agriculture, expanding their agricultural footprint. The situation in Luanda Reserve is unknown but likely to be critical. Unless a more concerted and sustained effort is made to save the giant sable, these pressures will lead to the extinction of Angola's national symbol. The government's lack of emphasis on conserving the giant sable indicates its lack of environmental consciousness and capacity. As things stand, the existence of this species hinges on the efforts of one individual: Mr. Pinto.

## **D2g. Without Environmental Impact Assessment and Regulatory Capacity, Unbridled Growth Threatens the Ecology of Waterways and Coastal Systems**

Angola's environmental governance apparatus is highly ineffective and the environmental consciousness of decision makers is quiescent. Under these circumstances, the environment is being trampled under the development banner. A number of ongoing and planned projects will profoundly impact Angola's ecosystem. This threat applies to virtually every ecosystem in Angola, but it is most imminent in the case of certain waterways and coastal areas. The team could not identify all major development projects in the pipeline, but heard from different sources that several hydroelectric projects are planned for the Kwanza River, and witnessed attempts by a Chinese company to establish a shrimp farm within Kissama National Park. In the absence of an effective environmental impact assessment, mitigation and enforcement system these activities will seriously affect the ecology of these waterways and associated coastal systems.

## **D2h. Poor Environmental Management by Mining Companies Has Devastating Environmental Impact on Rivers and Riverine Vegetation**

The state mining company ENDIAMA is responsible for developing Angola's diamond sector. It does so largely through joint ventures with multinational companies, in which it retains a majority ownership position. ENDIAMA's profits depend on the net income of the various joint ventures in which it participates.

ENDIAMA officials view investments in environmental management and mitigation with skepticism. Partner companies are allowed to operate without taking into account the full environmental impacts of their mining activities. This results in mining practices that leave behind severely degraded riverine ecosystems.

## **SECTION E. ACTIONS NECESSARY TO DECREASE PRESSURES ON BIODIVERSITY AND TROPICAL FORESTS AND RECOMMENDATIONS TO USAID**

The three program areas under USAID/Angola's strategy — 1) investing in people; 2) economic growth; and 3) governing justly and democratically — do not explicitly address any of the root causes of negative environmental trends affecting the country. The current strategy is slated to guide the mission's investments through FY2009. There was no clear indication that the mission is contemplating including an environmental component in its next strategy.

It is possible to argue that by investing in people's education and improved governance in general under program areas 1 and 3, the mission is implicitly addressing some of the causes behind the loss of biodiversity and forests such as poor environmental governance. To help Angola tackle threats to its ecology and address the root and immediate causes for the loss of biodiversity and degradation of forested areas, however, the mission must significantly change its strategy.

The team learned that the mission has shifted the strategic focus under program area 2 from the one-dimensional "economic growth" to the multi-dimensional "economic development."<sup>8</sup> This is a step in the right direction. However, the concept of "sustainable development" would explicitly recognize the importance of good environmental stewardship to the future of the country and the well being of its people. It would also create the strategic space for the mission to help safeguard Angola's tourism potential and regenerative capacity of its renewable resource base in preparation for the country's post-petroleum future. The sections below describe some priority intervention areas.

### **E1. Elevate the Environmental Consciousness of Government and Civil Society**

*The need:* The environment relegated to low priority imperils long-term development goals.

Angola is lifting itself up from three decades of civil war. The government focus is on getting the country's economy back on its feet, and the first step has been to rebuild the country's infrastructure. Environmental concerns are low-priority. Flush with funds from the oil and diamond mining sectors, the government does not need to resort to multilateral or bilateral donors, and it has no reason to follow international environmental guidelines. Likewise, Angolan households are too concerned with meeting daily needs to consider the negative environmental impacts that their activities may have in the medium-term. Except for a few tenacious Angolan environmentalists, the environment has not been on anyone's screen; there are no large international NGOs operating in the country, and the donor community, including USAID, has focused their attention elsewhere.

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<sup>8</sup> The USAID/Angola Web site lists three program areas: 1) democracy and governance; 2) economic growth; 3) health. The suggestion of a strategic shift from "economic growth" to "economic development" was provided by a reviewer of this document's first draft.

It is necessary to elevate the environmental consciousness of the Angolan government about the importance of good environmental stewardship. This process will take time. There is evidence — the signing of the UNFCCC, the Biodiversity Convention, and the Kyoto Protocol — that the government responds to international opinion.

*Recommendation:* The team found evidence that the donor community has turned its attention to the environment. As indicated earlier in this report, there are several donor activities that will result in the implementation of environmental programs. Furthermore, Angola recently completed its National Biodiversity Conservation Strategy and Action Plan.

The problem in Angola is not a lack of resources, but a lack of willpower and human resources. The donor community, perhaps with USAID leadership, can elevate environmental issues by initiating a discussion about the importance of Angola's environment, particularly from the standpoint of the country's post-petroleum future. The starting point could be a high-visibility conference on the environment sponsored by several donors, including the United Nations. High-ranking officials and scientists, at the level of the director-general of the United Nations Environment Program, should be invited to show Angolans that the world is concerned and ready to help.

## **E2. Help Create Protected Areas in High Biodiversity Ecosystems**

*The need:* There are ecosystems with high levels of endemism and biodiversity without representation in Angola's protected areas system.

This report, and others dating to pre-independence, notes that Angola's protected areas system does not include its afro-montane forests. The same is true of the country's humid forests. This situation places a great deal of Angola's natural heritage in peril. There is a need to designate and legalize representative segments of Angola's most biodiverse ecosystems (afro-montane and humid Guineo-Congolian forests) as protected areas.

*Recommendation:* Resource and land tenure is not well-defined in Angola. In many areas of the country, land and renewable resources have become a free-access resource. This situation creates room for local (provincial or municipal governments) to establish and manage reserves for conservation purposes. In the case of Bicular National Park, the provincial government has taken the initiative to improve park management. Furthermore, the current budget assignment process means that local governments may submit "project" proposals for funding.

USAID could help conserve Angola's biodiversity by working with an interested provincial government and MINUA to develop a project to create at least one protected area in highland forest areas. Previous reports (IUCN 1992) recommended legal protection for sections of the afro-montane forest of Morro do Moco. Once MINUA and the respective provincial government (Huambo) agree, USAID should finance the following activities:

- Conduct a biological and socio-economic study to identify parts of these biodiverse ecosystems that maintain ecological integrity, and are in a socio-economic context (no population, positive attitude of population towards protected

areas or conservation, ownership status) that favor the establishment of a protected area. The study should also identify threats and opportunities.

- Map and prioritize these areas.
- Propose a legal figure and management model (local government, community, co-management) for the protected area.
- Develop a business plan that includes management needs.
- Help the local government or/and MINUA prepare a proposal for the creation of a protected area to the Council of Ministers.

If the exercise is successful, USAID should help to establish the protected area, including personnel training, development of geo-referenced databases, and developing threats-reduction strategy.

### **E3. Help Save Protected Areas Through a Development and Conservation Activity**

*The need:* There are no functioning protected areas in Angola nor models appropriate for management and conservation of protected areas.

Every protected area in Angola is under serious threat and there are no good examples of protected area management in the country. Targeted efforts have helped conserve small areas (Kissama National Park) and specific ecosystem components (giant sable in Cangandala). One incipient initiative (Bicuar National Park) is trying an alternative administrative model, in which the provincial government takes an active role.

There are at least two good reasons to support management of selected protected areas. First, there is the need to conserve elements of Angola's natural heritage before it is too late. Second, Angola needs examples of well-managed protected areas, to draw lessons, train conservationists, and raise environmental consciousness.

*Recommendation:* Three protected areas in Angola have rudiments of a management system: Kissama National Park, Cangandala National Park, and Bicuar National Park. A small part of Kissama is currently being protected by the Kissama Foundation, with resources provided by SONANGOL. Cangandala is the Giant Sable Conservation Project site, and Bicuar is the subject of a protected area management experiment by the Huila Provincial Government.

Contingent on the availability of resources, USAID should choose one or more of these national parks for sustainable protected area management systems. Kissama is unique because of the range of ecosystems it harbors (mangroves, coastal areas, baobab savannas, extensive wetlands). It offers the advantage of proximity to Luanda, where a potential tourism market exists. Cangandala is home to one of the last remaining populations of giant sable. Bicuar provides an opportunity to model protected area management in which local government plays a prominent role.

A protected area management and conservation program focused on one or more of these areas should have the following components:

- A community-based natural resources management program that would work with communities within and near park boundaries. This component should encompass

improved agricultural practices to reduce the need for the expansion of conservation areas.

- A protected area patrol system, preferably using local inhabitants.
- An ecosystem management and recovery component that could include the use of range management tools, such as the use of fire to influence animal distribution, fences for the creation of animal re-introduction areas, and the actual re-introduction of species that have been locally extinct.
- A training component for park guards, tourist guides, and field biologists.
- A sustainable financing component, including tourism development if feasible and funds from extractive industries and the government.
- Development of an appropriate management model.

#### **E4. Strengthen Government Institutions and Define the Regulatory Framework**

*The need:* Angola's environmental governance is deficient: some laws are outdated, others are under elaboration and regulations have yet to be drafted. Angola has undefined institutional mandates and lack of capacity.

Angola is emerging from three decades of war. The environment is low-priority and environmental institutions and legal instruments are not fully developed.

MINADER's IDF continues to exercise functions that are now legally ascribed to MINUA; the forestry law is under development; and regulations and procedures for existing laws are at times nonexistent and at others faulty.

*Recommendation:* Given government sensitivities, USAID should only attempt to help strengthen environmental governance capacity if explicitly asked to do so. This task may be better left United Nations organizations such as the FAO and the UNDP.

On the other hand, USAID should offer capacity building in environmental impact assessment, rapid ecological surveys, participatory methods, and enhancing remote sensing capability.

#### **E5. Activate the Giant Sable Conservation Fund**

*The need:* The Giant Sable Conservation Project has no reliable funding source.

Angola's current government budgeting procedure does not ensure a constant flow of resources for on-the-ground conservation activities. Furthermore, most conservation activities are undertaken by NGOs or projects with funding from a variety of sources, primarily oil companies such as SONANGOL and EXXON. The few individual biologists who lead these conservation activities find themselves overwhelmed not only by their conservation chores, but also by the need to continuously develop proposals and lobby for small amounts of money necessary to keep field-level activities going. The financial situation of these efforts is extremely precarious. This condition typifies the Giant Sable Conservation Project.

*Recommendation:* The oil industry in Angola has shown a modest willingness to fund conservation activities. Although funding has been sporadic and limited, the money has helped meet essential expenditures and keep alive the two most important

conservation activities in Angola: the Giant Sable Conservation Project and the Kissama Foundation's effort to manage Kissama National Park.

Given financial resources that oil companies currently generate in Angola, and their tepid but existing commitment to the environment, they may be able to contribute to conservation funds with very specific objectives and a well designed management structure.

In the case of the Giant Sable Conservation Project, there already exists a Giant Sable Fund which is a nonprofit organization established in the United States to fund activities to protect and study the Giant Sable. Its offices are located at 88 Black Falcon Avenue in Boston Massachusetts. The fund is affiliated with Citizens Energy, which provides legal, financial, and tax audit and review supervision. This is the same organization and structure used to manage the Angola Educational Assistance Fund, a USAID grant recipient.

USAID should commission an analysis to determine how best to capitalize and activate the fund so that it can start to realize its potential. This analysis should lead to identification of potential donors, a marketing strategy, the design of a disbursement and reporting mechanism, and a management structure, among other things.

#### **E6. Strengthen Angolan Conservation NGOs**

*The need:* the Government of Angola cannot manage protected areas. Angolan NGOs have taken the lead but have limited capacity.

The Kissama Foundation is leading one of the most visible conservation activities in Angola, the management of Kissama National Park. The foundation has managed to secure resources from SONANGOL and other donors to cover its administrative expenses and field operations, but the needs far exceed current funding levels. A recently approved GTZ-funded capacity building project will help support the Kissama Foundation's efforts. Other than that, the foundation is able to capture small amounts of resources from different organizations for very specific purposes.

*Recommendation:* The USAID mission should consider working with the Kissama Foundation to improve its technical administrative and financial management capabilities and diversify its sources of funding. This can be done in the context of a conservation project for the Kissama National Park.





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## APPENDIX A. INDIVIDUALS INTERVIEWED

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## **APPENDIX B. SCOPE OF WORK**

### **Scope of Work 118/119 Biodiversity and Tropical Forest Assessment USAID/Angola**

#### **I. Purpose and Objective**

The purpose of this task is to conduct an assessment of: (1) the current state of biodiversity and forest conservation in Angola, (2) the actions necessary in Angola to conserve tropical forests and biological diversity, and (3) the extent to which the actions proposed for support by USAID/Angola meet or could meet the needs thus identified. This assessment is intended to serve as a planning tool to assist USAID/Angola in better integrating environmental concerns into their existing and proposed programs in the short- and medium-term future. The assessment is also necessary for the purposes of complying with sections 118 and 119 of the Foreign Assistance Act of 1961, as amended, as well as critical to informing operational plans and the country assistance strategy.

The assessment will build on the 2007-2012 National Biodiversity and Strategy Plan (NBSP), and the briefly completed USAID/Angola FAA 118-119 Biodiversity and Tropical Forestry Analysis done in March 2006. The 2008 assessment will be carried out by a team of two international short-term consultants with experience in USAID strategic planning and sound knowledge of USAID's environmental policies and procedures, legislation and requirements as governed by the Foreign Assistance Act. The team will also include the mission environmental officer, Josefa Gomes and two Angolan consultants. The regional environmental advisor for USAID/Southern Africa, Camilien J. W. Saint-Cyr, based in Pretoria, South Africa, will have an advisory role.

#### **II. Background**

##### **2.1 Angola Environmental Profiles:**

Located in southwestern Africa, Angola is divided into 18 provinces bordered by 1,650 km of Atlantic coastline on the west, by the Democratic Republic of Congo and Zambia on the north and east, and by Namibia to the south. Angola is ecologically diverse due to its large size, tropical latitude, and physical variations in soils and altitudes. Angola has a total land area of 1,246,700 km<sup>2</sup> with nearly three quarters of the country situated on a plateau with altitude ranging between 1,000 and 1,300 m. The highest mountain is Morro do Moco with an altitude of 2,620 m. The climate is generally tropical but varies with latitude. Coastal zones are moderated by the cold Benguela Current. Rainfall ranges from more than 1,800 mm in the northern part of the country to a paltry 100 mm in Namibe Province (in the south, bordering Namibia). The population of Angola is estimated at about 12.3 million people (2007), with 34 percent of the population living in the country's urban areas.

Angola possesses valuable and expansive forest resources and a large portion of the country was historically covered by natural forests and savannah. There has been no systematic survey or inventory of forest resources since the 1970s, producing

significant discrepancies among the estimates of forest cover in Angola today, ranging from 40 percent to 62 percent. A recent estimate from the Institute for Forestry Development indicated that forests cover approximately 50 million ha, 8 million of which had some form of protected status on paper. There is minimal capacity to control or enforce rules related to forestry, wildlife and protected areas.

Angola is thought to be one of the most biologically diverse countries in Africa, with a large number of species of almost all groups of organisms distributed in different biomass and terrestrial ecosystems. However, it has been impossible to conduct field studies in most parts of Angola for the past three decades due to war, so only minimal recent data are available to confirm this and the existing information is rather diffuse. In 2007 Angola, completed its National Biodiversity Strategic Plan (NBSP). The NBSP presents actions to incorporate measures into development policies and programs to prevent degradation of ecosystems and loss of biodiversity. The NBSP is to be implemented by the Ministry of Urban Affairs and Environment with support from private organizations and civil society.

### **III. General Task**

Under the direction of a team leader, the assessment team will evaluate biodiversity and tropical forest issues in Angola. The focus of all activities taken under this assignment is threefold: 1) Assess the conservation status of biodiversity and forests in Angola; 2) identify actions necessary to better conserve biodiversity and tropical forests; and 3) describe how and to what extent actions proposed in the country operational plans meet, or could meet, the biodiversity and tropical forest needs thus identified.

### **IV. Specific Tasks**

The assessment team shall perform the following activities:

#### **A. Data Collection**

- Prior to departure, meet or phone the bureau environmental advisor, other Bureau for Africa technical staff, and other Washington, D.C.-based organizations to gather relevant information on regional and Angola-specific programs and agency environmental regulations.
- Obtain, review and analyze existing documentation on biodiversity conservation (and tropical forest conservation) in Angola, such as that prepared by government agencies, bilateral donors, and national and international NGOs. Available online materials will be gathered prior to the country visit (links to known literature examples are shown in section VII).
- Meet with USAID/Angola to get an understanding of the Mission's ongoing sectoral assessments, program goals and objectives under its current and proposed strategies. The Mission also may provide the team with advice and protocol on approaching USAID partners and host country organizations with respect to this assignment. The team will discuss organizations to be contacted and any planned site visits with the Mission and coordinate as required.

- Meet with and gather information from relevant ministries and agencies, donor organizations, international NGOs, and other organizations that are involved in forest and biodiversity conservation or other cross-cutting issues, or are implementing noteworthy projects.
- Conduct one to three priority site visits, as necessary, to supplement the understanding gained from interviews, literature, and other second-hand sources.

## **B. Analysis**

1. Summarize the status of biodiversity and tropical forests in Angola.
2. Summarize the social, economic, institutional, legal, and policy context for their use and conservation, including actions currently being taken by government, other donors, NGOs, and the private sector.
3. Identify critical needs that should be addressed for the strategy to positively influence the conservation of tropical forests, biodiversity, and water resources and improve the sustainable management of natural resources in Angola.
4. Identify the key direct and indirect threats to biodiversity and tropical forests. Identify the actions necessary to conserve and sustainably manage natural resources, biodiversity and tropical forests in Angola based on an analysis of country donor and NGO responses currently in place to meet these needs.
5. Analyze the existing Mission portfolio and proposed USAID/Angola Operational Plan through an environment lens and identify some environmental threats and opportunities in each strategic area of intervention including their potential impacts on FAA section 117, 118 and 119 issues and climate.

## **C. Report**

- Prepare a report on the status of biodiversity conservation efforts in Angola and implications for USAID or other donor programming that shall define the actions necessary for conservation. This report shall clearly meet the legal requirement of FAA Sec 118 and 119. An illustrative outline for the report is provided below, of which Sections “c”, “d” and “e” will be written by the environment and natural resource management (ENRM) specialist.
- Drawing on the report (even before it is finalized, if necessary), the consultant shall produce the mandatory Environmental Annex required for the USAID/Operational Plan. This annex should be 8-10 pages, and address explicitly the FAA 118-119 concerns in tropical forestry and biodiversity, key threats and opportunities for USAID/Angola’s response, and recommended actions. These will be taken up as appropriate in the USAID/Angola operational plan and country assistance strategy.

### **Illustrative Outline:**

- a. Introduction, describing the purpose of the analysis and methods used in conducting it, including the timing of the analysis in relation to the timing of USAID strategy development.

- b. An overview of the social, economic, legislative, and political context for sustainable natural resources management and the conservation of biodiversity and forests in Angola.
- c. An overview of the status of tropical forests and terrestrial and aquatic biodiversity in Angola, including ecosystem diversity, species diversity, threatened and endangered species, genetic diversity, agricultural biodiversity, ecosystem services, and protected areas. Specific attention will be focused on how logging, charcoal production, and land-use change affect forest cover. The Specialist will identify the root and immediate causes for these processes — economic importance and potential values of biodiversity will also be included.
- d. A summary of government, NGO, and donor programs and activities that contribute to conservation and sustainable natural resources management, including a brief assessment of their effectiveness, strengths, and weaknesses.
- e. An assessment of the threats to tropical forests and biodiversity, including direct threats and indirect threats or root causes of the direct threats. Specific mention of logging, charcoal production and other land-use changes that affect forest cover.
- f. Programmatic actions necessary to conserve biodiversity and forests in Angola.
- g. An assessment of how USAID Angola’s program currently addresses the key threats to biodiversity and forest conservation, including how activities can be modified to more effectively address these issues for future planning.
- h. All references used and cited in the report, including web URLs.
- i. Appendices will include: the SOW for the analysis, biographical sketches of analysis team members, a list of persons contacted and their institutional affiliation, and other background or supporting material as needed, including maps and photographs. Copies of key document, relevant maps and images, and copies of photographs obtained during the assessment should also be appended in a CD ROM with electronic versions of all written materials.

## **V. Deliverables**

The primary deliverable under this task order is the above-referenced report with an assessment of: (1) The status of biodiversity and forest conservation in Angola; (2) the actions necessary in Angola to conserve tropical forests and biological diversity, and (3) the extent to which the actions proposed for support by USAID meet the needs thus identified in the assessment.

There shall be seven deliverables under this activity:

1. Preliminary work plan and schedule: The contractor shall provide USAID with a work plan and schedule prior to traveling to Angola.
2. Progress report to the CTO and MEO after 10 working days from the start date (o/a February 21, 2008)
3. Oral debriefing within five working days preceding the departure date. The team shall meet with USAID/Angola to provide them with a brief of the report



- findings. The exit brief shall be accompanied by a short written summary of initial key findings and recommendations.
4. Draft report: The Contractor shall submit a draft report to the Mission Environment Officer and USAID/Southern Africa regional environmental advisor (as necessary) no later than (TBD) (based on timing of assessment). The draft report shall follow the generic outline discussed above, as refined during the course of the contract in consultation with USAID.
  5. Final report: Following a two-week comment and review period, a revised final report incorporating all comments will be submitted within two weeks of the review period end date.
  6. Ten copies of the bound final draft will be made available when the final is approved by the mission, as well as electronic copies in MS Word and Adobe Acrobat PDF.
  7. A short (8-10 p.) environmental plan (tropical forestry and biodiversity) annex, which consists of a summary and syntheses of the findings and recommendations of the assessment, including recommended actions for USAID/Angola within its strategic areas.

## **VI. Logistics and Methodology**

AFR/SD Biodiversity Analysis and Technical Support (BATS) will cover the technical assistance and associated expenses, including the service of up to two local consultants.

A three- to four-person team with the following composition and expertise is desirable to conduct this analysis. Total estimated LOE: 40 days (expat plus one local assistant) or up to 55 days (expat plus two local assistants).

*International Technical Assistance from Chemonics/Team Leader (1 person):* The team leader will be an environment and natural resource management (ENRM) specialist with prior natural resource experience in Africa. The team leader will have knowledge of the USAID Strategic Planning process related to tropical forestry and biodiversity (FAA Sections 118 and 119).

He will also have knowledge of and be responsible for providing information related to Angolan protected areas, rangelands, agro-biodiversity, the policy and legal frameworks governing environmental management in Angola, the analysis of relevant policies, biodiversity threats, opportunities, tourism and extractive industries.

The team leader will also be responsible for ensuring that all deliverables are handed in on time and that team members are aware of their particular responsibilities with respect to preparation, in country activities, and making contributions to deliverables.

Estimated LOE for International Technical Assistance includes: 2 days for preparatory work, 11 workdays in Angola, 8 days for follow-up and report writing, and 4 days for travel. Total estimated LOE: 25 days.

*International Technical Assistance from US Forest Service International Program (1 person):* This team member will be an environment and natural resource management (ENRM) specialist with prior natural resource experience in Africa. S/he will also

have knowledge of and be responsible for collecting background information and reporting on Angola's vegetation ecology, tropical forest threats and root causes, forestry industries, and opportunities to mitigate threats. S/he will also report on forestry institutions, including policies, laws, and regulatory issues that relate to forestry and biodiversity conservation in Angola.

*Estimated LOE:* Team member will contribute 26 days on this assignment, including 3 days for preparation, 11 workdays in Angola, 8 days for follow-up and report writing, and 4 days for travel. LOE will be provided separately through the U.S. Forest Service International Program.

*Local technical and administrative assistance (1 or 2 persons):* Senior-level protected areas specialist with demonstrated experience in/knowledge of Angolan protected areas, wetlands, rivers and coastal ecosystems -- in particular mangroves, the policy and legal frameworks governing environmental management in Angola, the analysis of relevant policies, biodiversity threats, opportunities, tourism and extractive industries. The local technical specialist has good contacts within Angolan government agencies, NGOs, international donors, and private sector preferred. S/he will arrange meetings with government ministries, local NGOs and other relevant organizations and to arrange all logistical support including car hire and chauffeur, hotel reservations and airport pick up/drop off. Estimated LOE for local technical assistance includes: 2 days for preparation, 11 workdays in Angola, and 2 days for follow-up and report writing. Total estimated LOE: 15 days or up to 30 days.

## **VII. Duration of Assignment, Level of Effort and Supervision**

Meetings, phone calls, and preparatory research will take place in December prior to departure for Angola. Work in Angola will take place from February 11-22, 2008. A six-day in-country work week is authorized for this consultancy. The consultancy will be carried out during the period of o/a February 11 – March 1, 2008. About 11 days will be in Angola, 8 days preparation and wrap-up, and 4 days travel. The international consultant will oversee the work of the local-hire consultants. The consultants will work under the technical direction of the USAID/Angola program officer team leader of the analysis team and the MEO. The regional environmental advisor based at USAID/Southern Africa, Pretoria/South Africa, will have an advisory role, to the extent available.

## **VIII. Illustrative Budget**

## **IX. Supporting documentation**

- Angola - Biodiversity. Convention on Biological Diversity, October 2007. [www.cbd.int/countries/default.shtml?country=ao](http://www.cbd.int/countries/default.shtml?country=ao)
- Best practices for biodiversity and tropical forest assessments Chemonics International Inc., USAID/EGAT/Office of Agriculture. April 2005. 28 pp. (508 KB), PN-ADE-673. [http://pdf.usaid.gov/pdf\\_docs/PNADE673.pdf](http://pdf.usaid.gov/pdf_docs/PNADE673.pdf)
- Earthtrends Biodiversity and Protected Areas, [www.earthtrends.wri.org/gsearch.php?kw=angola&action=results](http://www.earthtrends.wri.org/gsearch.php?kw=angola&action=results)

- Hirji, R., et al. “Defining and Mainstreaming Environmental Sustainability in Water Resources Management in Southern Africa.” SADC, IUCN, SARDC, and World Bank/IBRD. Maeru/Harare/Washington D.C. 318 pp., 2002
- Red List of Threatened Species, October 2007 National Biodiversity Strategic Action Plan – 2007-2012. IUCN. [www.iucnredlist.org/](http://www.iucnredlist.org/)
- SADC Facts and Figures 2000 [booklet].
- Tropical forestry and biodiversity (FAA 118 and 119) analyses: lessons learned and best practices from recent USAID experience. (655 KB) Associates in Rural Development, Inc. USAID/EGAT/Office of Environment and Natural Resources. September 2005. 74 pp., PN-ADE-195. [http://pdf.usaid.gov/pdf\\_docs/PNADE195.pdf](http://pdf.usaid.gov/pdf_docs/PNADE195.pdf)
- USAID/Angola FAA 118/119 Environmental Analysis, March 2006. [www.encapafrika.org/documents/biofor/Angola%20FAA%20118-119%20Analysis%20Mar%2013\\_06.doc](http://www.encapafrika.org/documents/biofor/Angola%20FAA%20118-119%20Analysis%20Mar%2013_06.doc)