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UGANDA BIODIVERSITY AND TROPICAL FOREST ASSESSMENT

FINAL REPORT

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PHOTO: Boundary between Bwindi Impenetrable National Park and surrounding farmlands and hillside agriculture, in the Kisoro area of southwestern Uganda.

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ACRONYMS

ACODE	Advocates Coalition for Development and Environment
APEP	Agricultural Productivity Enhancement Program
AWF	African Wildlife Foundation
CBD	Convention on Biological Diversity
CBO	Community Based Organization
CFR	Central Forest Reserve
CI	Conservation International
CITES	Convention on International Trade in Endangered Species
CSO	Civil Society Organizations
DEAP	District Environmental Action Plan
D/G	Democracy-Governance
DRC	Democratic Republic of Congo
ECOTRUST	Environmental Conservation Trust of Uganda
EG	Economic Growth
EIA	Environmental Impact Assessment
ENR	Environment and Natural Resources
ETOA	Environmental Threats and Opportunities Analysis
EU	European Union
FAA	Foreign Assistance Act (of the United States)
GOU	Government of Uganda
GTZ	German Technical Cooperation / German Development Cooperation
IFPRI	International Food Policy Research Institute
ITFC	Institute of Tropical Forest Conservation
ITN	Insecticide Treated Nets (mosquito bed nets)
IUCN	The World Conservation Union
JGI	Jane Goodall Institute
MCC	Millennium Challenge Corporation
MUIENR	Makerere University Institute for Environment and Natural Resources
MWLE	Ministry of Water, Lands and Environment

NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organization
NEAP	National Environmental Action Plan
NEMA	National Environment Management Authority
NFA	National Forestry Authority
NGO	Non Governmental Organization
NRM	Natural Resources Management
NWP	Nature, Wealth and Power
PAs	Protected Areas
PEAP	Poverty Eradication Action Plan
PMA	Programme for the Modernization of Agriculture
PRIME	Productive Resource Investment for Managing the Environment
PVO	Private Voluntary Organizations
QENP	Queen Elizabeth National Park
SCOPE	Strengthening the Competitiveness of Private Enterprise
SEAP	Sub-County Environmental Action Plan
SO	Strategic Objective
SOER	State of Environment Report
SWAP	Sector Wide Approach to Planning
THF	Tropical High Forest
UPDF	Uganda Peoples Defense Forces
USAID	United States Agency for International Development
USG	United States Government
UWA	Uganda Wildlife Authority
UWS	Uganda Wildlife Society
WCS	Wildlife Conservation Society
WID	Wetlands Inspection Division
WRI	World Resources Institute
WWF	World Wildlife Fund

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EXECUTIVE SUMMARY

USAID/Uganda is developing a new, multi-year strategy for US bilateral development assistance to Uganda. This report provides information and analysis required by the US Congress and stipulated in the US Foreign Assistance Act (FAA) of 1961. Sections 117, 118 and 119 of the FAA require USAID Missions to examine issues of environmental impacts and tropical forest and biodiversity conservation when preparing strategies for development assistance. The report includes an overview of the status of biodiversity and tropical forest conservation, a brief description of the natural areas of critical importance to biodiversity conservation and ecosystem services, and an analysis of major threats, opportunities for the conservation and sustainable use of natural resources. The assessment team also examined how the proposed activities in the new strategy for USAID assistance could contribute to conservation needs and developed recommendations for actions related to each of the four new Strategic Objectives (SO) in the new USAID strategy. These recommendations are aimed at capitalizing on opportunities to enhance synergies across the Mission SOs, particularly with respect to opportunities for supporting environmental sustainability and conservation objectives in a manner consistent with the overall strategy of USAID and in ways that help to address the needs identified in this assessment.

Uganda is exceptionally important in terms of biodiversity, with surveys reporting the occurrence of 18,783 species. Although the country covers just 241, 551 Km^2 and accounts for only 0.18% of the world's terrestrial and freshwater surface, Uganda harbors 4.6% of the dragonflies, 6.8% of the butterflies, 7.5% of the mammals, and 10.2% of the bird species globally recognized. Uganda has more species of primates than anywhere else on Earth of similar area. While Kibale National Park has an area of just 760 Km^2, it has 12 species of primates. In two Ugandan forests (Bwindi Impenetrable and Kibale National Parks), scientists have recorded 173 species of polypore fungi, which is 16% of the total species known from North America, Tropical Africa and Europe.

The high level of biodiversity in Uganda is a function of Uganda's location in a zone between the ecological communities that are characteristic of the drier East African savannas and the more moist West African rain forests, along with large differences in elevation and extraordinary combinations of terrestrial and aquatic habitats. Uganda includes several sites along the Nile River with spectacular waterfalls, including the Bujagali Falls (where white-water rafting is now conducted), Karuma Falls and Murchison Falls. The ecosystems range from the snow-capped peaks of the Rwenzori Mountains (Mountains of the moon), the Virunga Volcanoes and Mount Elgon to high altitude montane forests, to the open waters of Lakes Victoria, Albert and others, to the islands of Lake Victoria and Bunyonyi. Uganda has a unique blend of semi-arid woodlands, savannah and forest communities as well as a wealth of montane and lake habitats.

Over time, a high proportion of the vegetation of Uganda has been modified by cutting, cultivation, burning, grazing and other anthropogenic actions, and many of these vegetation types have been significantly reduced in quality and range over time. In terms of biodiversity conservation, it is the remaining naturally vegetated areas that contain the bulk of the species and ecosystems of particular concern. Many of these remaining natural areas are found only where they have been protected from human encroachment and other disturbances in officially designated protected areas or areas of protected private/public land. The remaining natural areas of Uganda include various subsets of forests, wetlands, grasslands/savannas and open water.

Natural forest types include those found at higher and lower altitudes and those with various plant compositions ranging from primarily evergreen to deciduous to bamboo forests. Forests and woodlands cover a total of 4.9 million hectares, about 24% of the total land area. Tropical High Forests (THF) cover 924,208 ha, forest plantations cover 35,066 ha and woodlands cover 3,974,102 ha. Wetlands originally occupied about 13% of the land surface area of Uganda. Most wetlands in Uganda occur outside of protected

areas, and their range and quality is rapidly being eroded for agricultural land. Recent estimates indicate that wetlands now cover only 484,037 hectares or about 2% of Uganda's total area.

Grasslands/savannas cover more than 50% of the land area of Uganda and are dominated in different locations by species as diverse as grasses, palms or acacias. Savannas throughout Uganda were once the home to large populations of rhinoceroses, elephants, giraffes, antelopes, lions, wild dogs and the like. Much of this habitat has been converted to human use for agriculture and grazing and a few of these large mammals, such as black and white rhinos and wild dogs, are considered to be extinct in the country. The remaining pockets of natural savannas and grasslands are primarily found in various protected areas in Uganda. Although large mammal populations are still relatively low following decades of over-hunting when Uganda was in turmoil, the numbers of many of these species are gradually making a come-back.

Open water is a category that includes major lakes such as Lake Victoria, Lake Kyoga, Lake Edward, Lake Albert, Lake George, and Lake Mburo and many smaller lakes, various stretches of the Nile River and rivers, streams and water bodies throughout the country. Collectively, these water bodies contain one of the largest assemblages of diverse freshwater fish species in the world. In Lake Victoria alone, more than 600 species of cichlid fish have been found, with as many as 102 species found in a single study of southern lake waters in the early 1990s.

The Albertine Rift is an important region for global conservation. It harbors more species of vertebrates than any other region on the African continent. This region shelters more than half of continental Africa's bird species and nearly 40% of its mammal species. There are more endemic mammals, birds and amphibians found in the Rift than any other site in continental Africa. The Albertine Rift was recently listed as one of the world's most endangered spaces, based on levels of species endemism and rates of habitat destruction. South-west Uganda is a key component of the larger Albertine Rift. In terms of biological diversity, the forest and lakes within this area constitute one of the richest parts of the world. The Rwenzori Mountains are reported to have more mammal species that any other site in Africa. The importance of the area for conservation stems from not only the high number of species but also an impressively high level of endemism.

The network of gazetted protected areas in Uganda is managed by Uganda Wildlife Authority (UWA) or the National Forest Authority (NFA). These are serving to conserve a significant portion of the biodiversity and remaining tropical forests in Uganda. Uganda has 10 national parks, 13 wildlife reserves, 10 wildlife sanctuaries and five community wildlife areas which are managed by UWA and represent approximately 13% of the total area. Of the 4.9 million hectares of forests, 30% are in protected areas (Forest Reserves, National Parks and Wildlife Reserves) and 70% are found on private land. Protected Areas (PAs) contain the country's Permanent Forest Estate (PFE), which is 1.9 million hectares. Of this, Central Forest Reserves (CFRs) cover 1,265,742 ha.

The threats to biodiversity have both direct and indirect causes. Four of the principal direct threats to the conservation of global biodiversity in Uganda are: i) habitat loss/degradation/fragmentation, ii) unsustainable harvesting and over-exploitation of living and non-living resources, iii) invasion by introduced species, and iv) pollution/contamination. However, these proximate causes to biodiversity loss in Uganda are not the root of the problem, and it is the root causes of biodiversity loss in Uganda that will need to be addressed if progress towards conserving biological diversity is to be achieved.

Over-exploitation of resources, which also includes over-hunting and harvesting, depletes Uganda's stock of animal and plant resources, which lowers populations, affecting the genetic diversity and increasing the risk of local extirpation and subsequent extinction. Over-exploitation occurs in connection with commercial operations, such as logging, and from local practices, such as medicinal plant harvesting. The decline of native fish species in Lake Victoria from over-harvesting and introduction of alien species is considered the largest documented loss of biodiversity ever inflicted by man on an ecosystem.

The reduction in the quality, quantity and connectivity of natural habitat is the greatest direct cause of biodiversity and tropical forest loss in Uganda, as well as in the world. Habitat damage, especially the conversion of forested land to agriculture land, has a long history in Uganda, largely driven by a combination of factors, including population growth, inequitable land and income distribution, and development policies. Despite the high incidence of disease, including HIV/AIDS, Uganda's population is growing fast and is over 80% rural. Human population growth rates for Uganda approach 3%, while the average world population growth rate is 1.3%. Human density estimates are also relatively high, with Uganda's national average of 102 people/km^2 compared to the world's average of 42 people/km^2.

Other factors contributing to habitat destruction are bushfires, poor agricultural practices, mining/drilling, construction, inappropriate sectoral policies and legislation, and armed conflicts and civil unrest. Armed conflicts have contributed to deforestation and the abandonment of the management of protected areas. The insecurity in northern and south-western Uganda makes it difficult for managers to be effective custodians of the protected areas in the region.

The problem of soil erosion is increasing with every passing year and little is being done at the policy level to significantly address the situation. Poor agricultural practices, such as over-stocking of rangelands and cultivation on steep slopes, contribute to erosion and siltation of water bodies, thereby altering ecosystems and species composition. Inappropriate policies, such as the agriculture policy of modernization, implicitly encourage monocultural and agrochemical-intensive farming systems that contribute to loss of genetic diversity through over-specialization and pollution of sub-soil ecosystems.

The deforestation rate in Uganda is estimated to be 55,000 ha per year, based on habitat change from 1990-1995. Other estimates push the figure higher to between 1.1% and 3.15% per year. The majority of the forest loss has occurred outside of protected areas. Approximately 25 million tons of wood are consumed annually in Uganda, which translates to about 1.1 ton per capita per year. The majority of that wood is used as household firewood (65%), charcoal (16%) and commercial and industrial firewood (14%). The trend in loss of forest cover shows an accelerated rate of deforestation in Uganda compared to a number of other countries. The National Biomass Study Project estimates that per capita forest area will decline from 0.3 hectare in 1991 to 0.1 hectare in 2025 if there is no serious investment in forestry. Today, while 50% of all the tropical high forest on private land is degraded, only 15% in forest reserves is degraded.

Pollution from the use of pesticides associated with cotton production and malaria prevention (residual indoor spraying), and herbicides used on tea and tobacco and in association with urban areas (solid waste, air pollution, etc.) poses a potential threat if not regulated by guidelines. The use of polythene bags and plastics pose a big threat to the soils particularly in the urban areas. While the level of industrialization in Uganda is still very low, the industries that are in operation are significant sources of pollution.

The introduction of exotic species into natural systems can affect biodiversity and tropical forests in many ways. Exotic species can out-compete native species and replace them in the system, thus reducing the species diversity, lowering genetic diversity, and increasing the homogeneity of the landscape.

The network of protected areas managed by UWA and the central forest reserves managed by NFA are well established and serving to conserve a significant portion of the biodiversity and remaining tropical forests in Uganda. However, oil / gas exploration in the Albertine Rift and associated claims on sub-soil / subsurface resources could create problems, along with pressures to develop hydropower and geothermal resources in Murchison Falls and Queen Elizabeth National Parks respectively. Encroachment and pressures of land conversion, illegal felling of timber, poaching, conflicts between wildlife and local communities, pollution, outbreaks of anthrax and other problems also threaten the integrity of these protected areas and complicate their management.

The policy and legislative framework for environmental protection and natural resource management is well developed, together with capable institutions such as NEMA, UWA, NFA and a range of civil society organizations and NGOs. External financing mobilized through international development assistance has played a key role in achieving the gains in institutional development, capacity building and progress achieved with field level interventions. However, the longer term prospects for sustainable financing of the programs of UWA, NFA, NEMA and others are not yet clear and progress could be undermined when critical project funding ends.

The State of Environment Report Uganda 2004/2005 shows that the investments the country, its development partners and civil society have made since 1994 have resulted in significant progress in the way the environment is managed. However, many challenges still remain and some are emerging, thus calling for a number of policy responses. In recent years, there has been considerable activity and progress related to environmental monitoring, oversight of reporting procedures, transparency in government agencies, measures to combat corruption and to increase the effectiveness of environmental conservation and natural resource management agencies – and associated advocacy of environmental and CBNRM issues by a strong network of civil society organizations, working on revenue sharing, empowerment of local communities, governance, awareness raising and environmental education. However, these efforts are threatened by the prospect of tighter controls on CSO and NGOs, and annual registration requirements for these organizations that are perceived to be working in opposition to the central government.

Priorities that require immediate attention include:

- increased attention to transboundary conservation issues and opportunities for the development of Peace Parks in northern Uganda
- sustainable financing of conservation activities
- donor coordination and support for more efficient means of sharing and disseminating information
- continued revision and updating of the national environmental policy and associated action plans
- strengthening of political will, institutional mobilization and enforcement capacity with respect to key institutions involved in conservation and environmental governance
- increased awareness of linkages between environmental management and economic development
- development of policies and laws related to the treatment and disposal of solid waste
- reinforcement of the integration of environmental aspects into local development planning
- increased attention to problems of soil erosion, soil fertility management, land use policy, natural resource inventories and environmental information

USAID/Uganda has recently completed the preparation of a multi-year Strategy Statement to replace USAID/Uganda's strategic plan for the period 2002-2007. USAID/Uganda's new strategy is designed to contribute to Uganda's comprehensive development framework, the revised Poverty Eradication Action Plan. Progress in alleviating poverty will need to be tied to improvements in competitiveness, control of corruption, good governance and others areas, as well as more attention to the conservation of biodiversity and tropical forests.

Past investments by USAID have helped to increase rural incomes and the productivity of agricultural systems, particularly in the southwest and western regions of the country but rural poverty is reportedly still increasing. USAID funding is supporting a number of interventions designed to reconcile conservation and development objectives, support CBNRM and increase the competitiveness of targeted value chains in critical

landscapes and these activities are being effectively implemented by experienced, capable teams working with local communities, government and private sector partners. To date, these investments have had a significant localized impact. However, there is a need to achieve impact on a scale commensurate with the problems and issues being addressed. In particular, revenue sharing needs to be considerably expanded in tandem with stronger efforts to increase tangible, community level benefits from conservation and tourism. Fiscal policies, economic drivers and growing market demands are still contributing to an extension of land use practices and natural resource use that are perceived as the "best bets" for improving rural livelihoods: bananas, maize, coffee, cotton, potatoes, sorghum, sugarcane, livestock production, unregulated lake fisheries, charcoal production, uncontrolled hardwood harvesting, tea estates, tobacco, fruit tree orchards (mango, avocado) and perennials (pineapple), game meat hunting, as opposed to other options for sustainable use and prescribed NRM best practices.

The mission has identified four strategic objectives (SOs), which collectively are aimed at providing assistance to address the high rate of population growth, low levels of education, the need to control and reduce the incidence of HIV/AIDS, malaria and infectious diseases, weaknesses in decentralization and governance, and to improve the prospects for food security, economic growth and increased industry competitiveness. Under the new USAID/Uganda Strategy Statement, there will be four Strategic Objectives (SOs). Two of the SOs from the 2002-2007 strategy will remain the same:

> SO7 "Expanded Sustainable Economic Opportunities for Rural Sector Growth" and
> SO8: "Human Capacity Improved"

From SO9 (Democracy and Governance program), there will be two new SOs:

> SO10 "Reinforce Uganda's Commitments to Pluralism and Good Governance"; and
> SO11 "Mitigate Causes and Consequences of Conflict"

Multiple opportunities exist for USAID/Uganda to increase the contributions of projects and programs supported under each of these SOs to overall efforts designed to conserve biodiversity and tropical forests. The USAID/Uganda Mission and USG are particularly well positioned to cooperate with a number of large, international NGOs with an interest in biodiversity conservation and sustainable development.

In addition to implementing the actions aimed at capitalizing upon potential synergies and leveraging greater program impact in relation to the USAID/Uganda program, (preceding section), the assessment team recommends the following:

- maintain the focus on the Albertine Rift
- reinforce the community conservation components of protected area management programs in frontline communities
- seek out opportunities to scale up program impacts over large areas
- increase support for CBNRM and community forestry interventions
- develop a sustainable financing strategy and conservation finance program
- strengthen coordination and knowledge management
- support widespread distribution of the 118/119 assessment report
- reinforce efforts aimed at donor coordination
- continue mission wide environmental training

- maintain support for strengthening of environmental management institutions
- increase efforts supporting land use planning
- support biodiversity inventories and long term monitoring

INTRODUCTION

USAID/Uganda is developing a new, multi-year strategy for US bilateral development assistance to Uganda. This report has been prepared to provide information and analysis as requested by USAID/Uganda and as required by the US Congress and as stipulated in the US Foreign Assistance Act (FAA) of 1961. Sections 117, 118 and 119 of the FAA require USAID Missions to examine issues of environmental impacts and tropical forest and biodiversity conservation when preparing strategies for development assistance. Specifically, this assessment is designed to take into consideration the FAA provisions related to:

- Section 117: consideration of the impact of proposed activities on the environment and how to implement programs with an aim toward maintaining and restoring natural resources upon which economic growth depends;
- Section 118: analysis of the actions necessary to achieve conservation and sustainable management of tropical forests and the extent to which the actions proposed by USAID meet these needs and
- Section 119: analysis of the actions necessary to protect endangered species and to conserve biological diversity and the extent to which the actions proposed by USAID meet these needs.

In 2001, as part of the process of preparing the USAID/Uganda country development strategy for the period 2002-2007, an Assessment of Environmental Threats and Opportunities and Biodiversity and Tropical Forest Conservation needs was prepared. The findings from this assessment were updated in December 2004 when a brief Environmental Analysis was prepared by the Mission's Natural Resource Management Advisor. This report provides a slightly more comprehensive assessment aimed at informing USAID/Uganda Mission strategic planning and program development and implementation. This report also meets the requirements of the relevant sections of the USAID guidelines for Environmental / Tropical Forestry / Biodiversity Conservation Assessments.

It includes an overview of the status of biodiversity and tropical forest conservation, a brief description of the natural areas of critical importance to biodiversity conservation and ecosystem services, and an analysis of major threats, opportunities for the conservation and sustainable use of natural resources. The report also examines how the proposed activities in the new strategy for USAID assistance could contribute to conservation needs and includes recommendations for actions related to each of the four new Strategic Objectives (SO) in the new USAID strategy. These recommendations are aimed at capitalizing on opportunities to enhance synergies across the Mission SO's, particularly with respect to opportunities for supporting environmental sustainability and conservation objectives in a manner consistent with the overall strategy of USAID and in ways that help to address the needs identified in this assessment. See Annex 1 for a complete Scope of Work for this assessment.

The report findings and conclusions are based on a series of interviews with key stakeholders and specialists and program representatives in Uganda and in Washington, D.C. and two weeks of field work in Uganda, including a site visit to areas of the Albertine Rift and adjacent landscapes in the southwest and western regions of Uganda. Annexes 2 and 3 to this report provide a list of documents reviewed and useful websites for further information). Annex 4 presents a schedule of interviews and field work, and lists contact information for key contacts.

This report was prepared in May 2006 by a two person team combining experience in tropical forestry, biodiversity conservation, natural resource management, environmental policy and related institutional issues. Dr. Gerald Eilu is a Senior lecturer in the Dept of Forest Biology and Ecosystems Management, Faculty of Forestry and Nature Conservation at Makerere University in Kampala. Dr. Eilu was a member of the Biodiversity Assessment team mobilized in 2001, and has conducted a number of biodiversity inventories and

field assignments related to the conservation and management of forests and other natural resources in Uganda. Bob Winterbottom is a Senior Manager in the Environment and Natural Resources Division of International Resources Group and over the past 30 years has worked on Tropical Forestry Action Plans, Environmental Action Plans, Desertification Control Plans and a variety of program assessment and institutional development activities in the field of Environment and Natural Resources. (See Annex 5 for biographical sketches of the team members).

OVERVIEW OF BIODIVERSITY AND TROPICAL FOREST CONSERVATION STATUS IN UGANDA

CURRENT STATUS OF BIODIVERSITY ASSETS, TROPICAL FORESTS AND WATER RESOURCES IN UGANDA

Uganda is exceptionally important in terms of biodiversity.[1] Surveys report the occurrence of 18,783 species (NEMA, 2006). Although the country covers just 241, 551 Km^2 and accounts for only 0.18% of the world's terrestrial and freshwater surface, Uganda harbors 4.6% of the dragonflies, 6.8% of the butterflies, 7.5% of the mammals, and 10.2% of the bird species globally recognized (***Table 1***). Uganda has more species of primates than anywhere else on Earth of similar area. For example, Kibale National Park covering 760 Km^2 has 12 species of primates. In two Ugandan forests only (Bwindi Impenetrable and Kibale National Parks), Ipulet (in Prep.) recorded 173 species of Polypore Fungi, which is 16% of the total species known from North America, Tropical Africa and Europe. Some components of biodiversity in Uganda (e.g. belowground biodiversity) are poorly known. Work on these groups is only at the initial stages, carried out mainly by universities and research institutes but constrained by a shortage of research funds. Improved knowledge of such elements of biodiversity could raise biodiversity levels considerably and need to be better understood.

Uganda is a land locked country, located in an area where seven of Africa's distinct biogeographic regions or phytochoria converge (White, 1983). Given Uganda's location in a zone between the ecological communities that are characteristic of the drier East African savannas and the more moist West African rain forests, combined with high altitude ranges, the country has a high level of biological diversity (Table 1). Updates on the 2001 SO7 assessment include less known taxa such as Fungi (Ipulet and Ryvarden 2005), Fish, Earthworms and others. Because of various threats, several species are included on IUCN Red lists (Table 2).

Table 1. Numbers of Ugandan species in taxonomic groups with preliminary data available (from Pomeroy and Mwima, 2002 with additions)

			Globally threatened species in Uganda (1)			
Taxon	Total no. species in Uganda	% Global species	CR	EN	VU	Total
Amphibians	86	1.7			14	10
Birds	1012	10.2	1	10	48	15
Butterflies	1242	6.8				
Dragonflies	249	4.6				
Ferns	386	3.2				
Fish	501	2.0				49

[1] For further information about the biological diversity resources of Uganda, see Environmental Analysis, 2005, by Jody Stallings (USAID/Uganda) and recently completed State of the Environment Reports for Uganda prepared by NEMA.

Taxon	Total no. species in Uganda	% Global species	Globally threatened species in Uganda (1)			
			CR	EN	VU	Total
Flowering Plants	4500	1.1	4	15	22	40
Fungi (Polypores)*	173	16	?	?	?	?
Liverworts	275	4.6				
Mammals	345	7.5	1	4	5	28
Molluscs	257	0.6				10
Mosses	445	3.5				
Reptiles	142	1.9		20	25	1
Termites	93	3.4				
Other Invertebrates						17
Total						170

(1) CR=critically endangered, EN=endangered, VU=vulnerable

Table 2. Number of extinct, threatened and other species of animals in each Red List Category for Uganda (IUCN Red list 2004)

Taxon	Plants	Animals
EX - Extinct	0	34
EW - Extinct in the Wild	0	4
Subtotal	0	38
CR - Critically Endangered	3	27
EN - Endangered	4	31
VU - Vulnerable	33	72
Subtotal	40	130
LR/cd - Lower Risk/conservation dependent	1	18
NT - Near Threatened (includes LR/nt - Lower Risk/near threatened)	8	64
DD - Data Deficient	1	41
LC - Least Concern (includes LR/lc - Lower Risk, least concern)	10	1,562
Total	60	1,853

MAJOR ECOSYSTEM TYPES, UNIQUE ASPECTS AND ENDEMIC SPECIES AND THEIR HABITATS

Uganda has an extraordinary amount of diversity in both terrestrial and aquatic habitats. It has the mighty Nile River, punctuated by various falls e.g. the Bujagali Falls (where white-water rafting is now conducted), Karuma Falls and Murchison Falls. The ecosystems range from the snow-capped peaks of the Rwenzori Mountains (Mountains of the moon), the Virunga Volcanoes and Mount Elgon to high altitude montane forests, to the open waters of Lakes Victoria, Albert and others, to the islands of Lake Victoria and Bunyonyi. There are several forest-fringed crater lakes that stud the rift valley floor and escarpment around Fort Portal and the Queen Elizabeth area. Uganda has a unique blend of semi-arid woodlands, savannah and forest communities as well as a wealth of montane and lake habitats.

Analyses of biodiversity in Uganda have relied on either the National Biomass Study map with 13 landscape categories (FD, MWLE, 2003) or the earlier analysis by Langdale-Brown et al. (1964) which determined 22 main vegetation types (with 96 subtypes) in Uganda. This second approach, which is now due for revision, is the one used in the detailed Wildlife Protected Area System Plan of the Uganda Wildlife Authority (1999).

Over time, a high proportion of the vegetation of Uganda has been modified by cutting, cultivation, burning, grazing and other anthropogenic actions, and many of these vegetation types have been significantly reduced in quality and range over time. The National Biomass Study (1996) shows how much this has changed and what remains. The situation has no doubt deteriorated further from the natural state since 1996.

In terms of biodiversity conservation, it is the remaining naturally vegetated areas that contain the bulk of the species and ecosystems of particular concern. Many of these remaining natural areas are found only where they have been protected from human encroachment and other disturbances in officially designated protected areas or areas of protected private/public land. The remaining natural areas of Uganda include various subsets of forests, wetlands, grasslands/savannas and open water.

NATURAL FOREST

Natural forest types include those found at higher and lower altitudes and those with various plant compositions ranging from primarily evergreen to deciduous to bamboo forests. Various forest specialist species of conservation concern are associated with the various forest types. For instance, mountain gorillas are found only in the higher altitude evergreen forests of the Albertine Rift. The Albertine rift endemic fish *Varicorhinus ruwenzori* has been recorded almost exclusively in aquatic habitat within forested sites of Bwindi Impenetrable National Park (Kasangaki, in prep.). A variety of endangered and rare bird species are forest specialists that are closely associated with only one particular forest type. Bennun *et al.* (1996) estimated that 187 of Uganda's 1007 bird species are forests specialists. As more and more forested land is converted to plantations such as the palm plantations on the Bugala Islands in Lake Victoria, more and more forest specialist species disappear. An analysis of tree species distribution in the Albertine Rift (Eilu et al., 2004) found that most tree species were geographically widespread and management strategies should therefore favor the landscape rather than site specific approaches.

WETLANDS

Wetlands originally occupied about 13% of the land surface area of Uganda (NEMA, 1999). Wetlands in Uganda are classified as lakes and estuarine wetlands, riverine swamps and flood plains. The lakes and estuarine wetlands comprise Lakes Victoria, George, Edward, Albert, Wamala, Bisina, Opeta, Kyoga, Kwania and Bunyonyi. The riverine swamps and flood plains include the Okole, Kafu and Nile systems (NRSP, 2001).

Uganda's wetlands contain significant habitats, flora and fauna. Many are under threat of degradation and loss. Degradation impairs wetland functions. Wetland degradation is defined as "the likelihood that a wetland site, or portion thereof, will be destroyed directly or indirectly, through human actions" (NRSP, 2001). According to the Ramsar Convention, wetland loss is defined as "the disappearance of wetland areas due to its conversion to a non-wetland area". Within this diversity of wetland types are many specialists. It has been estimated that 159 species of birds are wetlands specialists. Papyrus and other wetland plants have commercial value, at least 22 species of plants are edible, and many other plants are used for medicinal purposes. Most wetlands in Uganda occur outside of protected areas, and their range and quality is rapidly being eroded for agricultural land. Recent estimates indicate that wetlands now cover only 484,037 hectares or about 2% of Uganda's total area (National Biomass Report, 2003).

GRASSLANDS/SAVANNAS

Grasslands/savannas cover more than 50% of the land area of Uganda and are dominated in different locations by species as diverse as grasses, palms or acacias. Savannas throughout Uganda were once the home to large populations of rhinoceroses, elephants, giraffes, antelopes, lions, wild dogs and the like. A diversity of other plant and animal species are also closely associated with various natural savanna types. Much of this habitat has been converted to human use for agriculture and grazing and a few of these large mammals, such as black and white rhinos and wild dogs, are considered to be extinct in the country. The remaining pockets of natural savannas and grasslands are primarily found in various protected areas in Uganda. Although large mammal populations are still relatively low following decades of over-hunting when Uganda was in turmoil, the numbers of many of these species are gradually making a come-back. Aleper and Moe (2006) reports upward trends in elephant populations in the Kidepo National Park. The small numbers

of large ungulates and elephants, however, has enabled a diversity of vegetation types once subject to high grazing pressure to thrive, and various birds, butterflies and small mammal populations in these parks are now better off. Some natural habitat and wildlife species also remain in areas in northern Uganda (i.e. Gulu and Kitgum Districts) where rebels have been a problem and the local people live in Internally Displaced People's Camps (IDPCs).

OPEN WATER

Open water is a category that includes major lakes such as Lake Victoria, Lake Kyoga, Lake Edward, Lake Albert, Lake George, and Lake Mburo and many smaller lakes, various stretches of the Nile River and rivers, streams and water bodies throughout the country. Collectively, these water bodies contain one of the largest assemblages of diverse freshwater fish species in the world. In Lake Victoria alone more than 600 species of cichlid fish have been found, with as many as 102 species found in a single study of southern lake waters in the early 1990s (Arinaitwe, et al. 2000). The natural state of some of these water bodies was greatly impacted by the introduction of exotic species, including Nile perch, other fish species and water hyacinth. The hyacinth seems to be now under control. However, agricultural runoff, and clearing of the forest on the Lake Victoria Islands threaten the survival of species in the lake. In 2005-2006, drought reduced the water level in Lake Victoria adversely affecting Hydro Electric Power generation at the Owen Falls Dam. This reduction is partly attributed to destruction of natural forest on the Lake Victoria Islands and the resulting increase in run-off and siltation.

NATURAL AREAS OF CRITICAL IMPORTANCE TO BIODIVERSITY CONSERVATION AND ECOSYSTEM SERVICES

THE ALBERTINE RIFT

The Albertine Rift is an important region for global conservation (Mittermeier et al. 2004). It harbors more species of vertebrates than any other region on the African continent. This region shelters more than half of continental Africa's bird species and nearly 40% of its mammal species. There are more endemic mammals, birds and amphibians found in the Rift than any other site in continental Africa. Conservation International recently listed the Albertine Rift as one of the world's most endangered spaces, based on levels of species endemism and rates of habitat destruction.

The Albertine Rift stretches from the northern tip of Lake Albert in Uganda to the southern tip of Lake Tanganyika in northern Zambia. The natural habitat within this ecoregion, comprised of pieces of the Democratic Republic of Congo (DRC), Uganda, Rwanda, Burundi, Zambia and Tanzania, is equally diverse, ranging from glaciers at the top of the fabled Rwenzori Mountains, down through alpine moorland, forest lands and savanna grasslands. These landscapes support high levels of species richness and endemism (Table 3).

Table 3. Numbers of Albertine Rift endemic species. Total species are shared with Rwanda, Burundi, and the DRC.

Taxon	Butterflies†	Amphibians	Reptiles	Birds	Mammals
Total	123	32	21	41	29
Uganda	68	11	13	36	23
% of Total	55.3	34.4	61.9	87.8	79.3

†Davenport (2002).

THE ALBERTINE RIFT IN UGANDA

South-west Uganda is a key component of the larger Albertine Rift. In terms of biological diversity, the forest and lakes within this area constitute one of the richest parts of the world (Nantamu, 2005). The Rwenzori Mountains, for example, are reported to have more mammal species that any other site in Africa. The importance of the area for conservation stems from not only the high number of species but also an

impressively high level of endemism. Recent studies on Fungi in two forests of the Albertine Rift (Ipulet and Ryvarden, 2005a, Ipulet and Ryvarden, 2005b) report the first African records 41 species (including 13 new species to science and 16 African endemics, some of them possibly Albertine Rift endemics). Recent studies on fish assemblages in Bwindi Impenetrable National Park (Kasangaki, in Prep.) recorded a riverine cichlid *Haplochromis* sp. that is unknown to science and therefore un-described. Other un-described fish species recorded include the catfishes *Clariallabes* sp. (Clariidae) and *Amphilius* sp. (Amphilidae). Three of these fish species (the cyprinid *Varicorhinus ruwenzori*, an Anabantid *Microcteriopoma damasi* and a cyprinodontid *Hypsopanchax modestus*) are Albertine Rift endemics.

Wetlands in the Albertine Rift include high altitude swamps (such as those found in Bwindi Impenetrable National Park and Rwenzori Mountains National Park) which are critical natural habitats for rare species and serve as natural filtration systems to help clean drinking water. The high altitude swamps in Bwindi are, for example, important for the Grauer's Rush Warbler and Shoebill Stork. Both forest and wetlands are critical to helping regulate climate, particularly rainfall, upon which the agriculture of the Albertine Rift region is almost wholly dependent.

LAKE VICTORIA

Lake Victoria is the world's largest tropical freshwater lake and, until recently, supported 600+ endemic haplochromine cichlids (a group of fishes in the perch family). Lakes George and Edward, both international lakes, as is Lake Victoria, support 79 species of fish.

SANGO BAY ECOSYSTEM

The Sango Bay ecosystem is comprised of a system of wetlands and forests in southern Uganda (Rakai District). It borders Lake Victoria and contains 14% of Uganda's fish species and 41% of its bird species. At the mouth of Kagera River (partly in Tanzania partly in Uganda) the forests contain *Podocarpus* spp. and other species usually restricted to montane forest.

DRY MONTANE FORESTS

Dry montane forests occur in the east, and north of Uganda. Those of Karamoja contain a number of rare and restricted range species not found in other parts of Uganda. The area has thirty known regional endemic species of birds, among them the globally-threatened Karamoja Apalis (*Apalis karamojae*), and several endemic species of butterflies (*Papilio nobilis*, *Charaxes smaragdilis elgonae*). Most of these parts of the country have been insecure, but peace is now returning.

EFFECT OF CURRENT LAND TENURE SYSTEMS ON CONSERVATION IN UGANDA

Private land ownership is the exception, rather than the rule, in Uganda. Yet, only with security of ownership or long-term rights and control of resource access come a willingness to invest in and develop land, and apply sustainable resource utilization approaches. As peace returns to the north, clans will return to their traditional land. Many of these lands have not been officially gazetted to these clans. There exists the possibility of continued conflict over land tenure issues in a post-conflict era.

DECLARED AND PROPOSED PROTECTED AREAS AND THEIR STATUS

The network of gazetted protected areas in Uganda is managed by Uganda Wildlife Authority (UWA) or the National Forest Authority (NFA). These are serving to conserve a significant portion of the biodiversity and remaining tropical forests in Uganda. Generally, animals are found in Protected Areas (PAs) as well as areas outside PAs. Within the wildlife PAs there are two classifications that include Wildlife Reserves and National Parks. Uganda has 10 national parks, 13 wildlife reserves, 10 wildlife sanctuaries and five community wildlife areas which are managed by UWA and represent approximately 13% of the total area (Table 4). For ease of

management and in favor of the landscape approach, the UWA has grouped its estate into seven 'Conservation Areas'.[2]

Table 4 System of Wildlife Protected Areas in Uganda, 2005

National Parks	Wildlife Reserves	Community Wildlife Areas	Wildlife Sanctuaries
BINP Bwindi Impenetrable	AWR Ajais's	ACWA Amudat	EAS Entebbe
KINP Kibale	BKWR Bokora Corridor	ICWA Iriri	JAS Jinja
KVNP Kidepo Valley	BUWR Bugungu	KCWA Karenga	MKS Mt. Kei
LMNP Lake Mburo	EMWR East Madi	KTCWA Kaiso-Tonya	OFS Otze Forest
MENP Mount Elgon	KAWR Katonga	RCWA Rwengara	
MFNP Murchison Falls	KBWR Kabwoya		Sanctuaries in QENP/Kyambura
QENP Queen Elizabeth	KWR Karuma		Kahendero
RNP Rwenzori	KIWR Kigezi		Kashaka
SNP Semuliki	KYWR Kyambura		Kayanja
MGNP Mgahinga Gorilla	LOWR Lomunga		Kazinga
	MWR Matheniko		Kisenyi
	PUWR Pian Upe		Rwenshama
	TSWR Toro-Semliki		

Source: UWA (2005)

Forests and woodlands cover a total of 4.9 million hectares, about 24% of the total land area. Tropical High Forests (THF) cover 924,208 ha, forest plantations cover 35,066 ha and woodlands cover 3,974,102 ha. Of the 4.9 million hectares, 30% are in protected areas (Forest Reserves, National Parks and Wildlife Reserves) and 70% are found on private land. Protected Areas (PAs) contain the country's Permanent Forest Estate (PFE), which is 1.9 million hectares. Of this, Central Forest Reserves (CFRs) cover 1,265,742 ha. The National Forest Authority (NFA) manages the central forest reserves. The forests on private land are in many cases being over-harvested, degraded and converted to other uses, and the forests in National Parks are inaccessible for provision of forest products. Therefore, CFRs constitute the primary source of forestland that is available for a variety of uses.

STATUS OF TROPICAL FORESTS

The National Biomass Study carried out in the late 1990's and early 2000's, and published in 2003, is the most comprehensive analysis of land use in Uganda. Uganda has a total area of 24,155,058 hectares, of which farmland (35%) is the most extensive land use. Tropical forests can be defined broadly as all forests occurring between the Tropic of Capricorn and the Tropic of Cancer, regardless of altitude or forest type. Under this definition, all forests in Uganda could be regarded as tropical. However, for the purposes of this analysis, Ugandan tropical forests are defined as humid lowland, broadleaf forest. There are approximately 924,208 hectares of tropical forests in Uganda, which represent approximately 4% of the country's total area.

Central Forest Reserves (CFRs) in Uganda fall in two main categories namely those for production and those for protection. Production forests which include savanna bushland and grassland areas were gazetted for supply of forest products and future development of industrial plantations. The protection forests include all the tropical high forests, savanna woodlands and/or grasslands that protect watersheds and water catchments, biodiversity, ecosystems and landscapes that are prone to degradation under uncontrolled human use.

The National Forestry Authority has characterized CFRs according to the following criteria: i) CFRs of ecological value *(watershed protection, protection of water bodies and river courses);* ii) CFRs of biodiversity importance; iii) CFRs with tropical high forest; iv) CFRs of importance for industrial plantations *(especially timber and plywood)*; and v) CFRs subject to further consideration. The following is the scenario:

[2] For additional details concerning the size, status and specific biodiversity assets and management issues in each protected area, see UWA Annual Reports, and relevant sections of NEMA State of the Environment reports.

CFRs of ecological and biodiversity importance: This category includes CFRs whose main functions are to protect biodiversity, water catchments, riverbanks, lakeshores and stabilisation of steep slopes. A total of 1,073,983 ha in 353 CFRs (Figure 1) has been categorised as of ecological importance and therefore should be strictly protected. The whole cattle corridor covering most of western-through central to north eastern Uganda would be rendered unviable for cattle grazing and agriculture if these reserves were destroyed. The 'water for production' programme in support of the Poverty Eradication Action Plan requires these natural regulators and reservoirs of water flow.

There are over 1.3 million people in Mubende, Kiboga and Kibaale Districts of western Uganda. They depend on the water that is trapped by the forests in the Mubende – Kiboga hills that constitute an important part of the Kafu and Katonga River Systems. The forests in these hills and valleys ensure that the boreholes, wells and dams in the area are constantly refilled. The forests and wetlands ringing L. Victoria stand between the survival and extinction of the fish in the lake. Millions of people depend on lakes and rivers for their livelihoods. In 2002, fish exports brought in US$ 87.9m.

EXHIBIT 1

Privately managed woodlots are intensively utilized to provide a steady stream of poles, firewood and other forest products, particularly in the higher rainfall areas of southwestern Uganda; production from woodlots and managed private forests can contribute to significant reduction in pressure on remaining natural forests that are in protected areas.

Eucalyptus woodlots between Kabale and Kisoro, southwestern Uganda.

Load of poles headed to urban centers of demand along the road from Mubende to Kampala.

The forests and wetlands along the River Nile stand between the pollutants generated by human activities and the river's fresh waters. Millions of people live along the Nile. Their well being is threatened when the lake becomes polluted. In the Eastern Region the 21,870 ha of West Bugwe, Igwe-Luvunya and South Busoga CFR are the only natural forests remaining in the whole region. These have now been degraded by

encroachment. As the harsh Karamoja weather creeps on the rest of the country, people could be quite adversely affected if these forests were converted into agricultural land.

The Forest Nature Conservation Master Plan (FNCMP) of 2002, which was produced after a biological inventory, categorises the conservation importance of forest reserves as Prime, Core and Secondary. Some 840,100 ha (over 70% of the total CFR area) have been categorised as such. Most of the THFs in the Albertine Rift fall in one or other of these categories. The CFRs of Karamoja, Kitgum, Moyo and Yumbe constitute another stretch of important biodiversity areas located mainly in the mountains/hills that have been war ravaged. The Lake Victoria Crescent also constitutes another belt stretching from the wetland

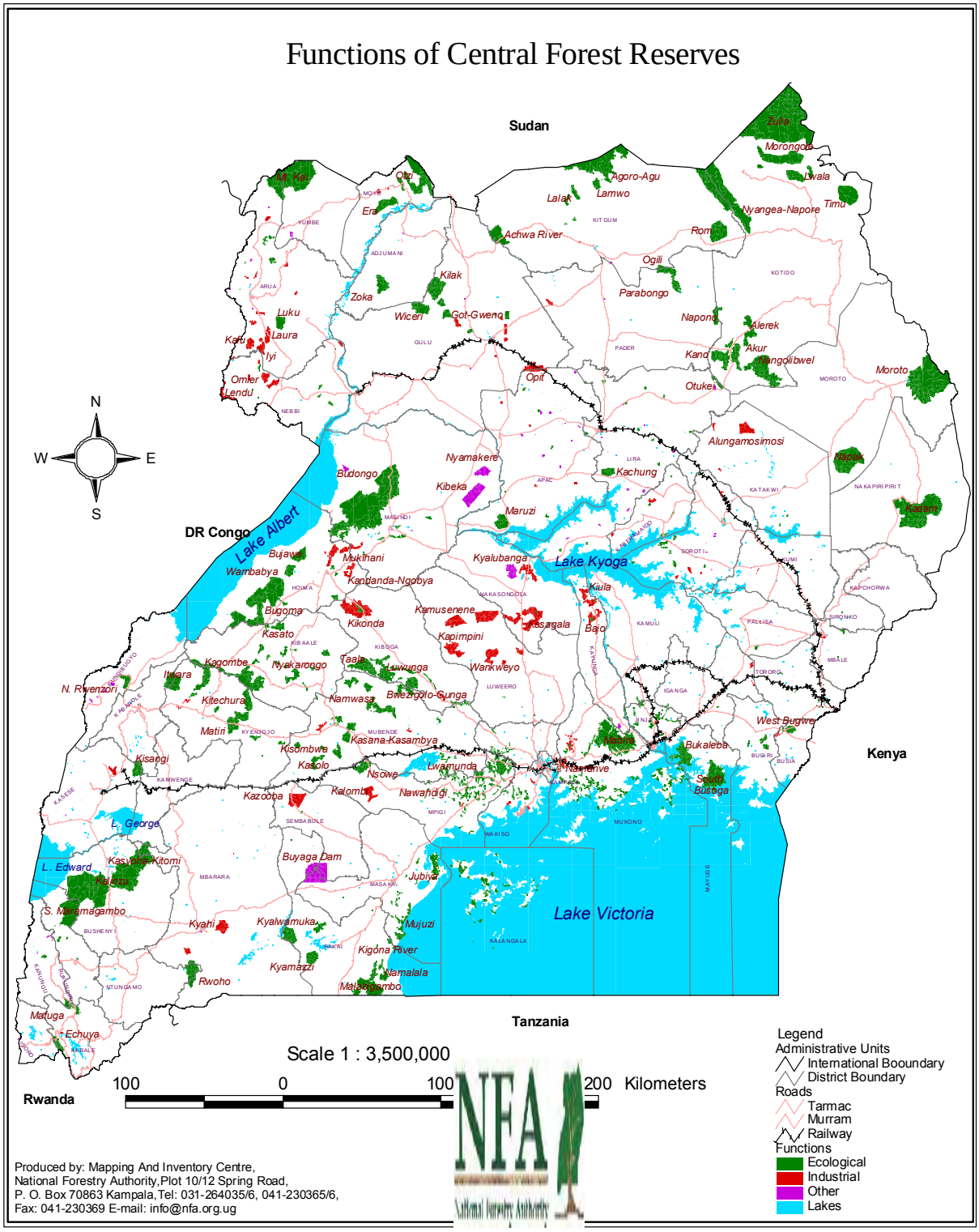
forests of Sango Bay, through the lakeshore forests of Masaka, Mpigi, Mukono and tapering off with the natural forests in Mayuge and Bugiri Districts.

Although the CFRs are important for biodiversity, the FNCMP has zoned them into 351,900 ha for production zones, 220,800 ha of strict nature reserve (SNR) zones for preservation of biodiversity and in between the two, 267,400 ha of buffer zones that are used to provide non-timber forest products. Out of an estimated annual timber consumption of 250,000 m^3, forest plantations contribute only about 50,000m^3. The rest comes from natural forests on private lands and CFRs. The timber in CFRs comes from the production zones, which contributes to the local domestic incomes. It also helps to meet part of the costs for protecting the forests.

Most of the CFRs with tropical high forest are either rich in biodiversity or they are in biodiversity corridors. They also protect watersheds, river valleys and lakeshores. In the drier areas, lush tropical high forests are found in valleys (e.g. the mahogany rich forests in Gulu, Kitgum and West Nile, the *Markhamia* forests of Mubende and Kiboga. These forests also protect the rivers and streams that originate in the hills. Their "sponge" effect soaks up the water that would otherwise run off and get lost and release it slowly to the streams and wells thereby guaranteeing all-year-round flow. Unfortunately these forests are the targets for encroachers because of the fertile soils.

CFRs of Importance for Industrial Forest Plantations: The majority of the CFRs in Luwero and Nakasongola Districts were set up for the establishment of industrial timber plantations. Indeed, in the late 1960s and early 1970s, plans were initiated to scale up planting in the area in the country. For more than 10 years now, the construction industry in Uganda has been growing at a rate of 5-8%. The industry uses a lot of timber, plywood, and poles. Major Government programmes consuming large amounts of wood products in the recent past include construction of power dams, schools and re-settlement programmes. Today, less than 3,000 ha of industrial plantations remain.

Figure 1. Central Forest Reserves and Functions in Uganda



THREATS TO BIODIVERSITY AND CAUSES OF BIODIVERSITY LOSS

The principle threats to biodiversity in Uganda continue, including habitat loss, modification and alteration, along with unsustainable harvesting, pollution and introduction of alien species. The decline of fish species in Lake Victoria is considered the largest documented loss of biodiversity ever inflicted by man on an ecosystem (Witte et al., 1999). The rate of biodiversity loss in Uganda is high and was calculated in 2004 to be between 10-11% per decade. While these figures are high, they are below the 1.0% yearly loss that has been recorded for the planet Earth as a whole.

If the extent of forest cover (including tropical high forests and woodlands) is taken as a proxy for Uganda's biodiversity, clearly the country has registered significant loss. Drastic changes in the forest cover have taken place in Uganda during the past century. In 1890, forests covered approximately 10,800,000 hectares or 52% of Uganda's surface area. By 1996, forest cover had declined to about 20%. Tropical high forest cover declined from 12% of total land area in 1900 to 4% by 2000 (FD, MWLE, 2003).

The historical loss of species has been great in Uganda, and the negative trends are continuing. Many major mammal species, such as rhinos, cheetahs, and oryx were extirpated during Uganda's decades of internal turmoil between 1970 and 1990. Birds and fish species continue to decline in numbers and distribution throughout the country. Most of the remaining large animals are confined to protected areas, where their numbers are small but stable or decreasing still. However, in a few cases (e.g. the mountain gorillas, elephants and kob), the trends show some increase partly because of the increased attention (Pomeroy and Herbert 2004).

The threats to biodiversity have both direct and indirect causes. Four of the five principal direct threats to the conservation of global biodiversity are considered to be the most important causes of the loss of biological resources in Uganda. These are: i) habitat loss/degradation/fragmentation, ii) unsustainable harvesting and over-exploitation of living and non-living resources, iii) invasion by introduced species, and iv) pollution/contamination. However, these proximate causes to biodiversity loss in Uganda are not the root of the problem, and it is the root causes of biodiversity loss in Uganda that will need to be addressed if progress towards conserving biological diversity is to be achieved. An examination follows of the direct causes that threaten species, ecosystems and ecoregions in Uganda. There are, however, very few long term studies/monitoring programs to keep track trends in biodiversity in relation to the threats. Monitoring programs for various taxa could be conducted efficiently if integrated as part of long-term studies of universities and research organizations.

OVER-EXPLOITATION OF RESOURCES

Over-exploitation of resources, which also includes over-hunting and harvesting, depletes Uganda's stock of animal and plant resources, which lowers populations, affecting the genetic diversity and increasing the risk of local extirpation and subsequent extinction.Over-exploitation can occur from commercial operations, such as logging, or from local practices, such as medicinal plant harvesting.The over-exploitation of non-timber products, such as native bamboo, can lead to the loss of biodiversity. For example, the high demand for bamboo poles from Echuya Forest Reserve and from Bwindi and Mgahinga National Parks has led to habitat destruction.

Over-exploitation has various origins.In some cases the species are persecuted because of their food value. In other cases, it is due to their commercial value or because they are used in popular medicines. In still other cases, over-exploitation is due to the pet and skin trade, whether to private or public collections.In some cases

EXHIBIT 2

Areas in western Uganda that were once forested are now being used for tea estates, cropland and other uses. The central forest reserves in this region need to be managed for sustainable timber production as well as biodiversity conservation and protection of wildlife habitat, or pressures will mount to convert them to other forms of land use.

Conversion of secondary natural forest to agricultural land between Fort Portal and Mubende.

Relatively undisturbed savanna landscale in the southern section of Queen Elizabeth National Park.

it is related to destructive extraction practices, such as the use of explosives or toxic substances in fishing activities. These and the indiscriminate harvesting of Uganda's biodiversity have, in the past, contributed to the loss of the country's species richness, particularly where wildlife is concerned.

During the 1970s, elephant and buffalo populations declined drastically due to massive poaching (Aleper and Moe 2006). In the late 1980s, with improved management and the reactivation of anti-poaching patrols in Queen Elizabeth National Park (QENP), a number of species – primarily kob, buffalo and waterbuck – increased rapidly. These species recovered to their 1960s levels by the mid-1990s due to strong and dedicated management of QENP. During the period 1996-2000, rebel insurgency greatly affected security in western Uganda. Uganda Peoples Defense Forces (UPDF) detachments were stationed in the protected areas to counter this insurgency. The presence of many armed people in QENP and adjacent protected areas was in the past detrimental to wildlife, but it is hoped that with sensitization they will play a more protective role. Meanwhile, the general demand for bushmeat has grown both locally and nationally.

Elephant populations have increased in western Uganda largely as a result of conflict along the DRC/Uganda border. Approximately 1,200 elephants have crossed over into Uganda to avoid the conflict in the DRC. These wildlife refugees are largely concentrated in the Queen Elizabeth National Park. The precipitous drop in the populations of kob and other species in Queen Elizabeth between 2000 and 2004 was most likely due to large-scale poaching.

HABITAT LOSS/FRAGMENTATION

The reduction in the quality, quantity and connectivity of natural habitat is the greatest direct cause of biodiversity and tropical forest loss in Uganda, as well as in the world. Habitat damage, especially the conversion of forested land to agriculture land, has a long history in Uganda, largely driven by a combination of factors, including population growth, inequitable land and income distribution, and development policies.

POPULATION PRESSURE AND HABITAT CONVERSION/DEGRADATION

A principal cause of habitat conversion is human population pressure. Despite the high incidence of disease, including HIV/AIDS, Uganda's population is growing fast and is over 80% rural. Human population growth rates for Uganda approach 3%, while the average world population growth rate is 1.3%. Human density estimates are equally astonishing, with Uganda's national average of 102 people/km^2 compared to the world's average of 42 people/km^2. Annually, more land must be brought under cultivation to feed the increased number of people. In places such as Kabale and Kisoro, which are located within the region of the Albertine Rift, the increased demand for agricultural land has led to land fragmentation, which is a generalized pattern observed across all of Uganda. The six Albertine Rift districts between Kasese and Kisoro along the DRC border have an average of 189 individuals/km^2, and if the protected areas and lakes are removed from the analysis, the human density on the remaining land for human occupancy skyrockets to 313 individuals/km^2. In some areas of the Albertine Rift human density approaches 600 individuals/km^2. During the last 15 years, the Ugandan Albertine Rift lost over 800 km^2 of forest habitat due to the high pressure from neighboring communities.

EXHIBIT 3

Population growth and urbanization, along with the expanding demands of a cash economy for education, health care, shelter, clothing and other necessities contribute to growing pressures to overexploit natural resources and to convert natural environments into production systems that yield the highest economic returns; if biodiversity conservation efforts are to succeed, they will need to generate significant levels of economic benefits to local communities through revenue sharing and other means.

Market in the densely settled region of Kasese, north of Queen Elizabeth National Park.

Mosaic of hillside agriculture, woodlots and pasture lands in Kabale region of southwest Uganda.

The deforestation rate in Uganda is estimated to be 55,000 ha per year, based on habitat change from 1990-1995. Other estimates push the figure higher to between 1.1% and 3.15% per year. The majority of the forest loss has occurred outside of protected areas. Approximately 25 million tons of wood are consumed annually in Uganda, which translates to about 1.1 ton per capita per year. The majority of that wood is used as household firewood (65%), charcoal (16%) and commercial and industrial firewood (14%).

The trend in loss of forest cover shows an accelerated rate of deforestation in Uganda compared to a number of other countries. The National Biomass Study Project (FD,MWLE 2003) estimates that per capita forest area will decline from 0.3 hectare in 1991 to 0.1 hectare in 2025 (Figure 1), if there is no serious investment in forestry. Today, while 50% of all the tropical high forest on private land is degraded, only 15% in forest

reserves is degraded. Given that most of the forest loss takes place on private lands, it is more than ever necessary to protect CFRs. Regional trends in loss of forest cover show a similar decline (Table 7).

Figure 2: Per Capita Forest Area for Uganda

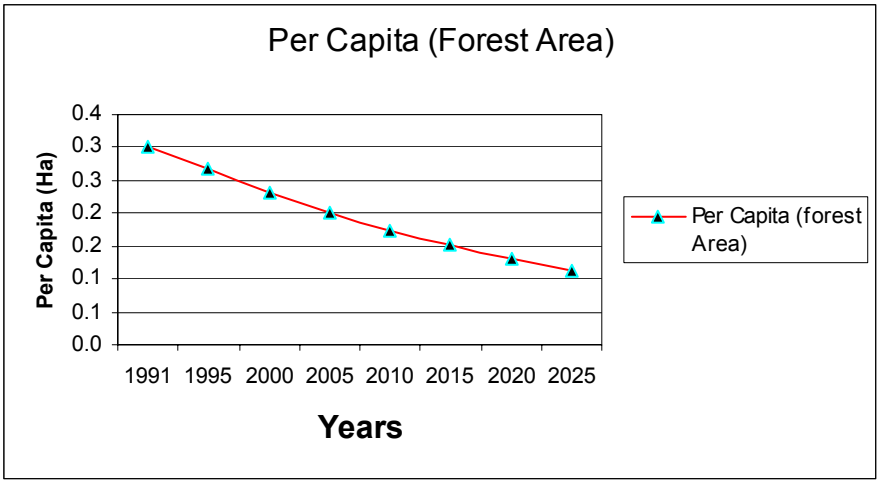


Table 7: Forest Cover Changes in Selected Countries

Country	1993 (World Resources Institute)	2000 (FAO)
Uganda	-1%	-2%
DR Congo	-0.6%	-0.4%
Tanzania	-1.2%	-0.2%
Kenya	-0.6%	-0.5%
Burundi	-	-9%
Rwanda	-	-3.9%
Libya	-	+1.4
Swaziland	-	+1.2

Other factors contributing to habitat destruction are bushfires, poor agricultural practices, mining/drilling, construction, inappropriate sectoral policies and legislation, and armed conflicts and civil unrest. Some species are eliminated while others proliferate. The domination of savanna woodland by fire-resistant *Acacia* spp is one example. In Lake Mburo National Park, the proliferation of *Acacia hockii* is considered a threat to the population of herbivorous animals.

ARMED CONFLICTS, CIVIL UNREST AND REFUGEES

Armed conflicts have contributed to deforestation and the abandonment of the management of protected areas. The insecurity in northern and south-western Uganda makes it difficult for managers to be effective custodians of the protected areas in the region. In the early 1980s, many peri-urban plantation forests were cleared for security reasons. This has in turn led to greater pressures on the surrounding natural forests for fuel wood, poles and timber. For example, in northern Uganda, the LRA conflict has had unequal impact on woody biomass. In general, areas where the conflict has been more intense are more intact. In areas where the conflict has been moderate to nil, the vegetation has been depleted. And forest areas adjacent to the Internally Displaced Persons (IDP) camps have experienced significant losses. The total woody cover changes noted between1985-2002 demonstrate a decrease of 8,750 km2 in some areas, and an increase of 11,775 km2 in some areas, which together imply a positive net change of 3,025 km2 woody vegetation over the 17 year period. At the same time, civil unrest in neighboring countries has resulted in influxes of refugees into Uganda. These refugees need land on which to settle, cut poles with which to build settlements, and collect fuel wood for cooking and heating. In addition to the

migrations of human refugees, the migration of wildlife fleeing conflict also shapes the habitat. Due to current insurgencies along the Congolese border, for example, approximately 1200 elephants have crossed over into Ugandan national parks.

SOIL EROSION

One of the indicators of land degradation is soil erosion. In 1991, Slade & Weitz (1991) estimated that soil erosion alone accounted for over 80% of the annual cost of environmental degradation representing as much as $300 million per year. By 2003, Yaron *et al.*(2003) estimated the annual cost of soil nutrient loss due primarily to erosion at about $625 million per year. Notwithstanding the accuracy of the data used in the two studies, the evidence is clear: the problem of soil erosion is increasing with every passing year and little is being done at the policy level to significantly address the situation. A national soils policy is needed urgently.

Poor agricultural practices, such as over-stocking of rangelands and cultivation on steep slopes, contribute to erosion and siltation of water bodies, thereby altering ecosystems and species composition. Inappropriate policies, such as the agriculture policy of modernization, implicitly encourage monocultural and agrochemical-intensive farming systems that contribute to loss of genetic diversity through over-specialization and pollution of sub-soil ecosystems. The introduction of high-yielding maize varieties and promotion of clonal coffee are current examples.

INVASIVE ALIEN SPECIES (IAS)

The introduction of exotic species into natural systems can affect biodiversity and tropical forests in many ways. Exotic species can out-compete native species and replace them in the system, thus reducing the species diversity, lowering genetic diversity, and increasing the homogeneity of the landscape. A preliminary list of IAS for Uganda (NARO 2002) includes species such as *Lantana camara, Broussonetia papyrifera, Mimosa pigra* and *Senna* spp. whose threat on native species has increased considerably. For example, *Senna spectabilis* has invaded over 1000 ha of the Budongo Forest Reserve and vast areas of the Matiri Forest Reserve (Kyenjojo District) while *Broussonetia papyrifera* has covered vast areas of the Mabira Forest Reserve. Control strategies for these species are not known.

Tree planting activities of NFA are focused on introduced species (*Eucalyptus* spp., *Pinus* spp. and *Grevillea robusta*). Although useful to meet short terms needs for timber, they could threaten the survival of native species if there are no guidelines for private tree planting. Moreover, the National Agricultural Advisory Services (NAADS) program has a focus on 'improved varieties' in a bid to modernize agriculture in line with the Plan for Modernization of Agriculture (PMA). Native species are ignored by these efforts. However, the integration of natural resource management is becoming important in NAADS programs and offers opportunity for addressing this anomaly.

Lakes and rivers might be the ecosystems most affected by the introduction of exotic species and the consequent ecological changes in species and community composition. For example, the introduction of the Nile perch and water hyacinth has been extremely damaging for biodiversity in Lake Victoria.

Lake Victoria is the largest tropical lake in the world, with 68,000 km2 of surface area shared among three countries: Uganda, Kenya and Tanzania. This lake supports Africa's most important inland fishery and, until recently, harbored more than 600 species of endemic haplochromine cichlids. Over the past century, the ecology of Lake Victoria has changed significantly and the fish stocks were subjected to three major events, which included fishing intensification, introduction of exotic species into the lake, and environmental changes. The introduction of the Nile Perch is thought to have been a major contributor to the collapse of the fish fauna, with approximately 40% of the haplochromine species disappearing. It is estimated that approximately 150 species of the haplochromine cichlids are extinct, 100 of them being from Ugandan waters.

POLLUTION

Pollution from the use of pesticides associated with cotton production and malaria prevention (residual indoor spraying), herbicides used on tea and tobacco and in association with urban areas (solid waste, air

pollution, etc.) pose a potential threat if not regulated by guidelines. The use of polythene bags and plastics pose a big threat to the soils particularly in the urban areas.

While the level of industrialization in Uganda is still very low, the industries that are in operation are significant sources of pollution. Many operate with obsolete equipment; others use environmentally-inappropriate technologies. Nutrient-rich industrial effluents into Uganda's open waters, particularly Lakes Victoria and George, have contributed to eutrophication.

OTHER THREATS

ENCROACHMENT AND CHANGES IN LAND USE (DEGAZZETTEMENT AND LAND GRABS)

There is a growing trend of change of land use of protected areas to agriculture or industrial expansion (UWS 2005). The protected areas are perceived by politicians and investors as a land bank for future appropriation for investment. This trend is worrying and has already claimed Bugala Islands for palm oil plantation, Namanve CFR for an industrial park, part of Pian Upe Wildlife Reserve for large scale agriculture and is likely to affect the South Busoga forests which are some of the few remaining forests at the shores of Lake Victoria.

ILLEGAL EXPLOITATION AND CROSS BORDER TRADE OF NATURAL PRODUCTS

Illegal exploitation of resources has been most pronounced on the Uganda-DRC border affecting mostly the timber resources. There is a possibility of such trade also affecting the northern Uganda region targeting products such as Gum Arabic and wildlife.

OIL AND GAS IN THE ALBERTINE RIFT

Prospecting for oil in the Albertine Rift is a major threat to biodiversity in the Albertine Rift. Hardman Resources Limited (from Australia) has confirmed that Uganda can produce commercial quantities of oil (up to an estimated 10000 barrels per day). This has raised excitement and other companies (Heritage Oil from Canada, and Tullow Oil from United Kingdom) are licensed to drill in other parts of the Albertine Graben (the country's oil exploration frontier). There is also prospecting for geothermal energy by the Ministry of Water, Minerals and Energy.Exploration activities such as road construction, drilling and movement of heavy machinery are likely to interfere with the behavior of wildlife. The question now asked is whether a refinery should be constructed in Uganda or should crude oil be exported through a pipeline to the East African coast. Habitat loss (to construction of roads and other infrastructure), pollution, population increase and increased pressure of extraction of resources (as more people are attracted to work in oil related activities) are occur, inevitably. Moreover, there are no proper guidelines to minimize the negative impacts on biodiversity. However, the World Bank funded Sustainable Management of Mineral Resources Project in the Ministry of Energy and Mineral Development offers opportunity to review the regulatory framework for the mining sector in Uganda and cross-sectoral laws affecting the mining sector e.g. the Land Act, NEMA Act, Uganda Wildlife Statute, and Forest Act.

RESETTLEMENT IN THE NORTH

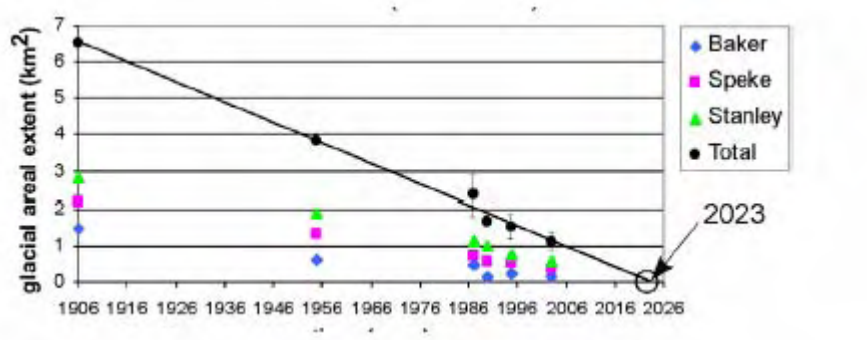
Resettling the Internally displaced people in northern Uganda is likely to pose a threat to the plants and animals. Methods of clearing woody biomass, road construction, agricultural expansion, and land tenure issues will be of concern.

CLIMATE CHANGE

The impacts of climate change are not very obvious to the ordinary Ugandan. However, recently there has been severe drought and evidence of change in glacial extent (area) on the Rwenzoris Mountains for the period 1906 to 2003 (Mileham *et al.* in prep.), Figure 3. If current trends in global warming persist, ice cover remaining on three of the six main mountains of the Rwenzoris (Mounts Baker, Speke and Stanley) will disappear altogether by 2023 (Mileham *et al* in prep.). Initially there were glaciers on six main mountains in the center of the Rwenzoris range (Osmaston, 2006). Projected increases in future temperatures will allow future changes in vegetation and other biodiversity to be predicted (Pomeroy & Tushabe 2004). For example, as the climate warms, the various Afroalpine vegetation zones can be expected to move to progressively higher altitudes and consequently to decline in area (Pomeroy & Tushabe 2004). The disappearance of ice cover will

mean reduced water flow in the streams downstream which feed into lakes George and Edward, and Semliki River discharging water into Lake Albert and ultimately into the Nile. The biodiversity and tourism potential of the Rwenzori Mountains National Park will also be affected. Issues of climate change, therefore, need to be given prominence as much as possible.

Figure 3. Changes in glacial extent: Rwenzori Mountains



Source: Mileham *et al.* (in prep.) in press quoted in Pomeroy & Tushabe (2004)

AVIAN FLU AND ANTHRAX

The impending threat of Avian flu is a big threat to biodiversity in Uganda. Experience from the outbreak of Anthrax in 2004 in Queen Elizabeth National Park (Environmental Brief No1, 2004) showed the potential impacts of such disease outbreaks. There is a need for emergency measures to address the problem should it occur.

CONSEQUENCES OF THREATS ON BIODIVERSITY

The consequences of these threats on biodiversity in Uganda can be measured at the ecoregional, ecosystem and species levels. The following section highlight threatened and endangered systems and species in Uganda.

'BIODIVERSITY HOTSPOTS'

The impact of human activity on global biodiversity has prompted conservation and development organizations to use "biodiversity hot spots" as a tool to identify geographical areas that merit immediate attention for priority conservation activities. This concept began in 1988 when the original 10 hotspots were composed of only tropical forests. Later in 1991, another 8 hotspots were identified that included other vegetation types. In 2001, that list grew to 25 hotspots. Just recently in February, 2005, another eight hotspots were identified and the Albertine Rift was "gazetted" in this new wave of endangered spaces. Currently, there are 34 biodiversity hot spots identified on the planet. In order to be placed on this conservation black list, an ecoregion needs to have high levels of species endemism and to have lost at least 70% of the natural vegetation cover. Unfortunately, the Albertine Rift meets these criteria.

THREATENED SPECIES

The threatened Ugandan flora and fauna are taken from the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and presented in Table 6. There are 10 species of animals and seven species of plants on Appendix I while 168 species of animals and 58 species of plants are listed on Appendix II. Three species of animals are considered Appendix III.

Table 6. Numbers of species on CITES lists.

Taxa	Appendix I	Appendix II	Appendix III
Animals	10	168	3
Plants	7	58	
Totals	17	226	3

SCOPE AND EFFECTIVENESS OF CONSERVATION EFFORTS

POLITICAL AND POLICY CONTEXT

Since the mid-1980s, Uganda's development policy has increasingly recognized the critical importance of natural resources to the country's economic base. There is also an increasing realization of the link between environmental degradation and poverty, population and inappropriate economic policy. This is apparent in Uganda's current political focus on poverty alleviation, as reflected in the Poverty Eradication Action Plan (PEAP), and in its overall focus on broad social and economic development. A number of policies contain references to the conservation of natural resources and biodiversity in Uganda. The more relevant of these are described below.

The Poverty Eradication Action Plan (PEAP). The PEAP currently guides GOU's development strategy with the objective of effecting a dramatic reduction in poverty. The PEAP includes five pillars:

- Economic Management
- Production, Competitiveness and Incomes
- Security, Conflict-Resolution and Disaster Management
- Governance
- Human Development

The GOU sees the wise use of natural resources as a means of eradicating poverty, and government's strategy hinges on conservation of soil, forests and biomass, water, wetlands and wildlife.

The most current version of the PEAP (July, 2005) stresses the importance of natural resource and biodiversity conservation over previous versions and is summarized as follows:

- Improving the income of the poor is linked to natural ecosystems;
- Achieving a sustained economic growth of 7% demands sustainable management of natural resources;
- All efforts geared at improving the incomes of the poor are ultimately linked to natural ecosystems;
- Land degradation is closely linked to population growth, cultural practices, and government policies and institutions; and
- In Kabale and other districts of Uganda, population pressure has resulted in land fragmentation resulting in plots that are increasingly becoming uneconomical to operate.

As a result of these issues, GOU has undertaken the following actions:

- Improving the income of the poor is linked to natural ecosystems; In Wetlands Sector Strategic Plan and a National Wetlands Policy (NWP) have been completed, and have paved the way for district Wetland Action Plans (WSPs), Community Wetland Action Plans and a National Wetlands Inventory.

- The National Environmental Management Authority (NEMA) is supporting District Environmental Action Plans and sectoral Environmental Impact Assessment guidelines. Sectoral guidelines for works have been implemented, and the draft guidelines for Water and Sanitation are being reviewed.
- The forestry sector completed a Forestry Policy (MWLE, 2001) and a National Forestry Authority (NFA) Statute has been enacted.
- Water resources management has been strengthened though the Nile Basin Initiative.

National Environment Management Policy (NEMP). The goal of the National Environment Management Policy (NEMP) is to enhance the quality of life for all Ugandans. The NEMP is supposed to guide sustainable economic development through sound environmental and natural resources management using a participatory approach. The NEMP promotes environmentally responsible social and economic growth and recognizes biodiversity conservation as a form of natural resources management that is critical to meeting the needs of Ugandans.

The Plan for Modernization of Agriculture (PMA). PMA is a poverty–focused framework that firmly endorses improved household food security and income generation through the market, and envisions an agricultural sector that is competitive, productive, diversified, export-oriented, and private-sector driven. The PMA gives a framework for increasing agricultural output through increased acreage, improved crop and animal varieties, and management.

The Medium-Term Competitiveness Strategy (MTCS). MTCS for the private sector is firmly focused on improving competitiveness of Ugandan business and promoting export development, while simultaneously implementing actions, such as infrastructure development and trade policy reform, to create an environment conducive to investment and private sector led growth. Past achievements have been fueled by agriculture and the future of broad-based economic growth in Uganda will continue to depend on agriculture. However, the gains of the past were based upon expansion of the cultivated area, rather than productivity gains. Since only 25% of the land in Uganda is considered "highly productive," continuing expansion increasingly pushes farmers onto marginal land, producing low yields and damaging the nation's biodiversity. Fostering growth and increasing incomes will depend upon increasing productivity in the agricultural sector, primarily through the closer integration of agriculture programs with sustainable natural resource management interventions in critical landscapes. At the same time, agriculture alone cannot produce the growth that is needed to raise Uganda's population above poverty. It is imperative to find alternatives through economic diversification. This implies improving the capacity and sustainability of enterprises of all sizes, and creating a policy and regulatory environment that is conducive to efficiency, competitiveness, and sound environmental management.

ANALYSIS OF CURRENT LEGISLATION RELATED TO THE ENVIRONMENT AND BIODIVERSITY

LAWS SUPPORTING THE CONSERVATION AND IMPROVED MANAGEMENT OF BIOLOGICAL RESOURCES AND ENDANGERED SPECIES, INCLUDING INTERNATIONAL TREATIES

Legislation and policies: A number of regulations have been put into place to protect the Ugandan environment, including the conservation and sustainable utilization of biodiversity.

The Constitution (1995) charges the state, including local governments, to promote the rational management of natural resources as a measure to safeguard and protect biodiversity. The National Objective and Directive Principle of State Policy in the Constitution (No. XIII) on natural resources commits the State to, *inter alia*, ….. *protect important natural resources, including water, wetlands, …. fauna and flora on behalf of the people of Uganda.* Under Article 237, Clause 2(6), there is a provision for the protection of water bodies, wetlands, forests, national parks and any land to be reserved for ecological or tourist purposes for the common good of all citizens.

Due to the various cross-cutting importance of both wildlife as a resource and wildlife PAs, the *National Forestry and Tree Planting Act 2003*, the *Land Act 1998*, the *Wildlife Act* (GoU 1996), and the *Local Governments Act 1997* provide a broad legal framework for the conservation of natural resources including the management of wildlife.

The Environment Statute (1995) provides for sustainable management of the environment. One of the principles of environment management is to maintain stable functioning relations between the living and non-living parts of the environment through preserving biological diversity and respecting the principle of optimum sustainable yield in the use of natural resources.

The Wildlife Statute (1996) aims to enhance economic and social benefits from wildlife management by permitting wildlife user rights in community wildlife areas. It also emphasizes public participation in wildlife management.

The National Forestry Plan (2000), **Forestry Policy** (2001) and the **National Forestry and Tree Planting Act** (2003) enacted to operationalise the policy in 2003: All these instruments commit government to protect and sustainably manage the Permanent Forest Estate (PFE), set aside permanently for conservation of biodiversity and environmental services and sustainable production of forest produce. The Land Act of 1998 recognizes CFRs as it prohibits their leasing or alienation and requires all landowners to manage and utilize their land in accordance with the Forests Act and other relevant laws. The PFE lands are set aside permanently for the conservation of biodiversity, the protection of environmental services, and the sustainable production of domestic and commercial forest produce. The Central Forest Reserves are held in trust for the people of Uganda and managed by the National Forestry Authority (NFA). Forests on private land are not adequately protected by law. There is always a risk of converting them to other uses.

The Water Statute (1996) emphasizes the rational management of water resources. Uganda and other countries in eastern and southern Africa have experienced increased incidences of drought. The national water policy should address research issues on water source potentials, per-capita water needs, and guide research in economics of water supply and conservation technology.

The National Wetlands Policy (1996) was the first of its kind in Africa and aims to curtail the rampant loss of wetlands resources and to ensure that benefits from wetlands are sustainable and equitably distributed to all people of Uganda.

The Decentralization Statute (1993) is the legal framework for decentralization or devolution of power to the district and lower level. It provides for the establishment of the District Environment Committee (DEC) as a functional committee of the district local council (DLC) and provides for appointment of the District Forest Officer (District Forestry Services), District Environment Officer, and District Wetlands Officer.

Statutory Instruments. There is a provision in Uganda's legislative system under which certain categories of leaders, such as cabinet ministers, commissioners or directors, are allowed to issue regulations called statutory instruments, as follow-ups to Acts of Parliament. Statutory instruments offer the flexibility to plug regulatory loop-holes in any of the statutes dealing with the conservation and sustainable utilization of biodiversity.

Local Legislation. This consists mostly of bye-laws at the district, sub-country and village levels where in fact biodiversity is most abused or negatively affected. The ability to pass bye-laws at the lower levels offers additional flexibility for strengthening the regulatory framework for the conservation and sustainable utilization of biodiversity.

National Biodiversity Strategy. Uganda signed the Convention on Biological Diversity on June 12, 1992, and ratified it on September 8, 1993. A national working group was subsequently established under NEMA to develop a biodiversity strategy. The strategy is currently in the Cabinet of the government awaiting approval but is long overdue.

DIFFERENCES IN LAWS THAT REQUIRE HARMONIZATION

As Uganda's urban areas increase in number and the urban population grows, pollution, whether air, noise, water or solid waste, is emerging as a significant issue in environmental management. Standards have been established for noise and air pollution and effluent discharge, enforcement of the standards notwithstanding. However, while guidelines have been developed for solid waste management, a stronger law is required and the pre-requisite is a national policy on solid waste management (SOE 2004/5).

INSTITUTIONAL FRAMEWORK

The National Environment Management Authority (NEMA). NEMA was created as a result of the National Environmental Action Plan (NEAP) process and the National Environmental Statute. NEMA is the government body charged with ensuring that projects, programs and activities undertaken by the public and private sectors do not have negative environmental impacts. NEMA has a cross-sectoral mandate and is the principal national authority on environment matters, including biodiversity. The mandate of NEMA for the environment includes responsibility for the implementation of the provisions of the Convention on Biological Diversity (CBD). NEMA works in a coordinating, supervisory and monitoring role with the lead agencies listed below.

NEMA is expected to encourage, supervise, monitor and coordinate environmental actions among and between sectors, provide technical and training input, and provide policy level assistance to other agencies. Specifically regarding Environment Impact Assessments (EIA), NEMA has recruited EIA specialists and registered private firms that have the skills to carry out EIA's. NEMA is engaging the private sector to include EIA in the planning phase of investment.

Uganda Wildlife Authority (UWA). UWA created in 1996 by an Act of Parliament and is a merger of Uganda National Parks (NP) and the then-Game Department (GD). For increased management effectiveness

and to allow for greater community participation, UWA has zoned Uganda into seven wildlife conservation areas. A conservation area may include national parks, wildlife reserves, wildlife sanctuaries and community wildlife areas. Furthermore, the Wildlife Statute, 1996, places ownership of all wildlife in the country in the hands of the state. This means UWA can manage wildlife in both protected and unprotected areas.

National Agricultural Research Organization (NARO). NARO was established in 1994 as an autonomous research organization.The various institutes of NARO address different aspects of biodiversity conservation and sustainable utilization.For example, the Fisheries Resources Research Institute (FIRRI) is responsible for aquatic biodiversity; while the Forestry Resources Research Institute (FORRI) deals with biodiversity in forest areas.The various agricultural research institutes also have set up crop and livestock genetic resources conservation programs.NARO and its institutes work closely with the Consultative Group on International Agricultural Research (CGIAR) and its various international agricultural research centers (IARCs).

The National Forest Authority (NFA). NFA within the Ministry of Lands, Water and Environment replaced the Forest Department (FD). The NFA is becoming largely self-supporting through collection of fees and revenue obtained from managing forests. The NFA will have broad representation of stakeholders, a characteristic shared by the new forestry policy, which also maintains a conservation role for planning and collaborative management, encouragement to NGOs and CBOs, and multiple use strategies. The former policy of government retaining ownership of natural resources on private and customary land is discarded and landowners have become owners of the natural resources on their land. However, this is posing a big threat to the natural forests on private land.

EXHIBIT 4

The establishment and strengthening of institutions such as UWA and NFA have greatly contributed to the protection of wildlife and forests, and to the conservation of biodiversity and improved management of parks and reserves in Uganda; however, additional capacity building and institutional support for decentralized environmental management institutions is needed at the local level to protect biodiversity outside of protected areas.

UWA ranger checking for payment of entrance fees at Queen Elizabeth National Park.

Boundary between Bwindi Impenetrable National Park and surrounding farmlands and hillside agriculture, in the Kisoro area of southwestern Uganda.

The Wetlands Inspection Division (WID). This is housed in the Ministry of Water, Lands, and Environment. It administers the National Policy for the Conservation and Management of Wetland Resources and has produced and is implementing the Wetland Sector Strategic Plan 2001-2010 (WSSP). The Wetlands Inspection Division has achieved considerable progress in raising awareness on the conservation of wetlands in Uganda.

ASSESSMENT OF THE EFFECTIVENESS OF POLICIES, INSTITUTIONS AND ACTIVITIES TO ACHIEVE BIODIVERSITY CONSERVATION

The State of Environment Report (SOER) for Uganda 2004/2005 shows that the investments the country, its development partners and civil society have made since 1994 have resulted in significant progress in the way the environment is managed compared to the baseline situation of 1991 to 1994. However, many challenges still remain and some are emerging, thus calling for a number of policy responses. Some of the key policy responses required are the following.

- Increase levels of enforcement and strengthen enforcement and extension capacity for improved natural resource management and environmental protection, especially at the local government levels.
- Formulate a national solid waste management policy to facilitate the development of appropriate laws to govern the management of solid waste.
- Create awareness among policymakers that environmental management can complement national economic development in fulfillment of the objectives of sustainable development.
- Prepare a manual to guide local governments on how to mainstream environment into district development plans so that the practice becomes routine.
- Create appropriate incentives and disincentives to encourage the more active participation of local communities and the private sector in environmental management, and discourage wrong doers.
- Encourage the Plan for Modernization of Agriculture and the National Agricultural Advisory Delivery Services secretariats to increase interventions addressing soil erosion as a matter of priority since it is the main cause of soil nutrient loss and the largest share of the annual cost of environmental degradation which has led to negative adjusted net savings.
- Complete the formulation and the subsequent adoption of the Land Policy and the Land use Policy so as to facilitate the preparation of land use plans.
- Seek international assistance in the compilation of more current inventory data (forests, wildlife, fisheries, land use changes, rangeland conditions, etc.) to allow for more informed decision making in environmental and natural resources management.
- Encourage different sectors to prepare annual reports as this will provide a rich source of information which can be used to prepare other reports including the state of environment reports.
- Revise both the National Environment Management Policy and the National Environment Action Plan to accommodate emerging issues such as greater levels of investment in aquaculture, solid waste management and payment for environmental services.
- Encourage Government ministries and agencies, civil society organizations and the private sector to identify innovative financing mechanisms for environmental management including creating markets for Uganda's ecosystem services.

Sector Wide Approach to Planning (SWAP): In part, for purposes of budgetary allocations, the Ministry of Finance, Planning and Economic Development advocates for a sector wide approach to planning (SWAP). Environment and several of the natural resources sectors did not belong to any specific 'budgetary' sectors.

The exception was originally wetlands, which developed a Wetlands Sector Strategic Plan (WSSP), allowing it a favored status in budgetary allocations. Of late, there have also been other sector strategic plans. For example, there is the Land Sector Strategic Plan (LSSP), the Forest Plan, and the Fisheries Master Plan.

ROLE OF CIVIL SOCIETY, TRANSPARENCY, ACCOUNTABILITY AND GOOD GOVERNANCE

When the first SOER for Uganda was produced in 1994, the country had 39 districts. By the time the last SOER for Uganda was produced in 2002, there were 56 districts. This SOER 2004/05 is being produced when there are 70 districts. The stated reason for the creation of more districts is to take services closer to the people, brought about by increasing population. The new districts as of July 2006 are: Amolatar, Amuria, Budaka, Bukwo, Buteleja, Ibanda, Isingiro, Kaabong, Kaliro, Kiruhura, Koboko, Manafwa, Mityana and Nakaseke.

From the perspective of environmental management, the new districts will need to appoint district environment and natural resources management officers (lands, forestry, environment and wetlands) to fill the new positions created at district level. Similar to the older districts the new ones will have to undergo the district environment action plan (DEAP) process. To some extent, the DEAP process may not be as involving as was the case in the past.

The reason is that a number of the districts have been formed by combining several sub-counties of former districts. Where such a district had undergone the DEAP process, each of the sub-counties brought together to form the new district would have had a Sub-County Environment Action Plan (SEAP). Hence, the SEAPs of the sub-counties forming the new district would only need to be updated and synthesized into a DEAP for the new district.

Notwithstanding the foregoing, whether a new DEAP calls for synthesizing existing SEAPs or a whole new effort, resources will have to be made available for the preparation of the DEAPs. The district environment offices will have to be equipped and the capacities of the officers built or strengthened.

Previously, there were debates about the appropriate institutional home of the District Environment Office. Several districts put environment together with production; others with health; and a few others with the planning department. Due to its cross-sectoral nature and to facilitate mainstreaming of environment into district sectoral development plans, Moyini *et al* (2001) had advocated for the environment office to be housed with planning. The Ministry of Public Service has recommended the establishment of a district level Directorate or Department (depending on the size of the district) of Environment and Natural Resources to house lands, forestry, environment and wetlands through the current institutional re-structuring exercise. Thus, even at district level, environment has gained a higher level of prominence. Furthermore, the close association of environment with the other natural resources sectors (lands, forestry and wetlands) can be seen as a positive development. A further improvement in terms of fulfilling one of the goals of the National Environment Management Policy (MNR 1994) would be to bring fisheries into the newly created Directorate or Department of Environment and Natural Resources. Furthermore, since districts are responsible for the management of vermin once UWA makes a declaration on certain species or animal populations as provided for by the Wildlife Act (GoU 1996) and the Local Governments Act (GoU 1997), a wildlife management unit should also be made part of the new environment and natural resources institutional structure. Such a move would assist the Uganda Wildlife Authority (UWA) to delegate the responsibility of managing wildlife biodiversity outside protected areas to the districts. It would also facilitate easier supervision of the wildlife use rights classes specified in the Wildlife Act.

PRIORITIES REQUIRING IMMEDIATE ATTENTION

Transboundary issues and development of peace parks in northern Uganda

Uganda shares important ecosystems with its neighbors (SOE 2005). It shares Lake Victoria with Kenya and Tanzania. The Nile Basin has ten countries, including Uganda where the River Nile originates. Lakes Edward

and Albert are shared with the Democratic Republic of Congo (DRC). The Mount Elgon ecosystem is shared with Kenya. The Rwenzori Mountains ecosystem is shared with the DRC. The mountains of the Virungas (Muhavura, Gahinga and Sabinyo) in the southwest are shared with Rwanda and DRC. Other important biodiversity areas such as Queen Elizabeth, Bwindi, Semliki and Rwenzori National Parks (NPs) border the DRC. Mgahinga Gorilla NP borders Rwanda. Kidepo Valley NP, Otzi Forest Reserve (FR), Agoro-Agu FR and Zulia FR border the Sudan. These are potential sites for development of Peace Parks in northern Uganda. The region from Lake Albert down to Mgahinga Gorilla NP of the Albertine Rift is an area of endemism, an eco-region of international importance in the conservation of biodiversity. It is globally ranked among the world's top areas.

The implications of the existence of substantial transboundary natural resources is clear. The country and its partners must put in place protocols, agreements or mechanisms for the conservation, sustainable use and equitable sharing of the benefits of the transboundary resources. Significant success has been achieved with respect to the management of Lake Victoria. An institutional structure is in place for the management of the Nile Basin, called the Nile Basin Initiative (NBI). Studies are underway to identify suitable approaches for the joint management of the Mount Elgon ecosystem. Regional collaboration is also in place for the management of the mountain gorillas of the Virungas and Bwindi Impenetrable National Park, at the technical level at least. There is also an effort funded by the McArthur Foundation involving the joint management of the 'Greater Virunga Landscape'. However, collaboration is generally weak at the moment when it comes to the management of the other transboundary natural resources Uganda shares with the DRC.

Financing of conservation activities: Many of the environmental management activities in Uganda are undertaken with development partner assistance. Ensuring future sustainability for environmental financing requires innovation and more commitment from the Government. Options might include environmental tax or levy, principally the work of the Ministry of Finance Planning and Economic Development (SOE 2005). New mechanisms for raising financing include promoting payment for environmental services. Government ministries and agencies, and civil society organisations and the private sector should be encouraged to promote the markets for Uganda's biodiversity products and ecological services. Local governments could also increase their non-tax revenue base through the promotion of tourism based on cultural heritage resources.

Donor Coordination: While efforts are underwork to provide for a measure of donor coordination through the sector wide approach to planning, this mainly provides a framework to articulate overall levels of funding with respect to GOU outlays and commitments. In view of the large numbers of donor agencies and organizations engaged in actions that have direct or indirect linkages to biodiversity and tropical forest conservation, much could be gained by more frequent, efficient, informal exchanges among the major donors and other key stakeholders to facilitate coordination of interventions and to promote greater collaboration and synergies. Rotating leadership could reduce the burden of providing for proactive leadership in donor coordination, and a more structured and explicit outline of responsibilities and modalities for donor coordination could also improve the efficiency of the informational meetings. More attention could also be given to regular exchanges of information gained from program evaluations and identification of "what's working and why", assessments of strategic priorities and analysis of best practices (principles and insights about "how" to increase program effectiveness, achieve targeted results and positive impacts, motivate behavior change, etc.).

National environment policy and action plan: Both the National Environment Management Policy and the National Environment Action Plan are now old and outdated. There is need to revise the two instruments in order to accommodate emerging issues such as greater levels of investment in aquaculture, solid waste management and payments for environmental services, and to increase the attention given to regulatory and fiscal frameworks, tenure-related reforms and other incentives. Local communities need to be encouraged through appropriate incentives and disincentives to conserve the environment and natural resources. Likewise, the private sector should be persuaded through appropriate disincentives to refrain from damaging

the environment. The private sector should also be encouraged through a set of incentives to view environmental goods and services as a source of wealth.

Political Will, Institutional Mobilization and Enforcement Capacity: The political will to support development that is truly sustainable and consistent with the national forest policy, environmental policy, biodiversity conservation and related goals needs to be clearly articulated and consistently supported in dialogue with donors, the private sector, local stakeholders and other groups. In partnership with these organizations, new and creative ways of mobilizing institutions to implement sound policies and existing regulatory frameworks need to be identified and supported. Government entities at both the central and local levels need to increase efforts aimed at the enforcement of existing environmental laws and regulations. Standards of "best practice" and voluntary guidelines should be promoted for industries in the private sector. Compliance with international environmental conventions and agreements of which Uganda is a signatory should be improved.

Awareness creation: Policymakers need to be made aware that environmental management can complement national economic development. This calls for the application of the tools of integrated assessment and planning. Donor agencies and organization also need to regularly invest in in-service training, periodic workshops, dissemination of information briefs, field visits and other efforts designed to raise awareness of the importance of biodiversity, threats and opportunities to conserve biodiversity and progress achieved in conserving biodiversity and improving environmental management. Other donors could follow the example of USAID by offering environmental training for staff and extending it to partners.

Treatment and disposal of solid waste management: There is an urgent need to develop a national solid waste management policy and an accompanying law to strengthen the provisions in the NEMA guidelines and regulations. For example, the Uganda Cleaner Production Centre is assisting several companies to reduce generation of waste, by conserving raw materials, substituting toxic and dangerous materials, and recovering, recycling and re-using by-products, among others.

The development framework at local government levels: The provision of the National Environment Management Policy calling for the integration of environment into development plans needs to be emphasized at the local government levels. Manuals need to be prepared to guide the local governments in integrating DEAPs or SEAPs into DDPs and SCDPs.

Soil erosion: The Plan for Modernisation of Agriculture, NAADS and district agricultural and land offices should be encouraged to recognise soil erosion as the topmost problem in farming, and devote greater resources for addressing it. At the national level, the draft National Soils Policy needs to be revised, updated and adopted. Thereafter, a National Soils Sector Strategic Plan ought to be elaborated based on the policy.

Land policy and the land use policy: Both the Draft Land Policy and Draft Land Use Policy need to be adopted by Cabinet to facilitate revisions to the Land Act and to allow for the preparation of land use plans to promote the optimal utilisation of the country's land resources. The vegetation maps prepared by Langdale-Brown *et al.* (1964) need to be digitized for purposes of establishing baseline conditions pertaining at Uganda's independence and detail vegetation surveys conducted to map the current status of Uganda's vegetation.

Natural resource inventories and stock assessments; availing environmental information: It is quite a long time ago that many of the inventories of natural resources (forests, wildlife, fisheries, etc.) were carried out. Inventories are expensive, but vital for informed decision making in natural resources management. Greater support should be given to environment information initiatives so that timely information can be availed for decision making.

Sectoral reports: The different sectors should be encouraged to prepare annual reports. These reports would also constitute useful data for the preparation of the national and district state of environment reports, and other environment and sustainable development reports including the fulfillment of national obligations of the various MEAs.

ANALYSIS AND ASSESSMENT OF USAID/UGANDA STRATEGY

PROGRAM CONTEXT

USAID/Uganda has recently completed the preparation of a multi-year Strategy Statement to replace USAID/Uganda's strategic plan for the period 2002-2007. USAID/Uganda's new strategy is designed to contribute to Uganda's comprehensive development framework, the revised Poverty Eradication Action Plan (PEAP).

Over the past 25 years, Uganda has overcome earlier political and social upheavals to move ahead with strong economic growth, marked by the diversification and development of exported products, progress in addressing the HIV/AIDS pandemic, and favorable conditions for the emergence of a strong civil society. In recent years, this progress has faltered and the rate of economic growth has slowed, as it has been hampered and undermined by continued conflict and displacement of more than a million people in the northern districts, corruption and other deficiencies in governance, shortages and increasing prices for energy, weaknesses in the competitiveness of coffee and other export crops, inadequate attention to education, health care and expansion of employment opportunities in the face of continued rapid population growth, vulnerability to drought and insufficient investment in programs aimed at environment management and sustainable use of natural resources. The net result has been an increase in inequality and in the proportion of the population living in poverty, from 34% in 2000 to 38% in 2003. Poverty is particularly acute in rural areas worst affected by chronic conflict (Gulu, Kitgum, Pader districts) where 90% of the population is living in extreme poverty.[3]

As President Yoweri Museveni takes the oath of office for a third term, and extends his 20-year tenure as head of state of Uganda, the newly appointed Cabinet and government officials will need to show renewed leadership to address important challenges. Uganda has a large (27 million) and rapidly growing (3.3% annual rate of growth) population which is making it difficult for social services and other development programs aimed at improving human welfare to achieve significant and lasting gains. Life expectancy is still just 47 years, and Uganda ranks 144 out of 177 on the UN human development index. Progress in Uganda with democratization, decentralization and improved governance has been mixed. The country has moved ahead to adopt a multi-party system, but the NRM party and leadership remain dominant and assertive of their power and influence. As part of an effort to gain votes in recent elections, the political leadership has abolished the district level graduated tax, which served to erode the fiscal independence of local government and comprised the long term effectiveness of donor assistance aimed at supporting decentralization and district level interventions. After showing improvement from 2001 to 2004, when it rose from 1.9 to 2.6, the Corruption Perception Index fell back to 2.5 in 2005.

Over the past several years, Uganda has also slipped in the ranking of Global Competitiveness Index surveys, from 80 out of 102 countries in 2003/2004 to 87 out of 117 countries in 2005/2006, and the country has made only limited progress relative to other countries in critical areas that affect competitiveness, such as human capital development, health, investment in resource productivity, infrastructure development, support for public-private partnerships, access to credit, rule of law and efficient delivery of commercial justice, control of corruption, tax reform and creation of a business friendly legal and regulatory environment.[4]

[3] See USAID/Uganda, Mission Strategy Statement, Section A. Uganda Program Rationale. May 2006.

[4] See *Compete Uganda* newsmagazine, prepared with the assistance of USAID SCOPE Project, Issue no. 6, January-March 2006, p. 8.

The conservation of biodiversity and tropical forests in Uganda needs to be appreciated against this backdrop of political and economic development challenges. Without a doubt, the country has unique and globally significant biodiversity assets, including many concentrated in the Albertine Rift, one of the most important regions for global conservation, with more endemic mammals, birds and amphibians than any other site in continental Africa, and with more species of vertebrates than any other region on the African continent, including more than half of continental Africa's bird species and nearly 40% of its mammal species. However, it will be difficult to protect and conserve this biodiversity in the face of increasing rural poverty and poor governance.

Past investments by USAID have helped to increase rural incomes and the productivity of agricultural systems, particularly in the southwest and western regions of the country but rural poverty is reportedly still increasing. USAID funding is supporting a number of interventions designed to reconcile conservation and development objectives, support CBNRM and increase the competitiveness of targeted value chains in critical landscapes and these activities are being effectively implemented by experienced, capable teams working with local communities, government and private sector partners. To date, these investments have had a significant localized impact. However, there is a need to achieve impact on a scale commensurate with the problems and issues being addressed. In particular, revenue sharing could be and needs to be considerably expanded in tandem with stronger efforts to increase tangible, community level benefits from conservation and tourism. Fiscal policies, economic drivers and growing market demands are still contributing to an extension of land use practices and natural resource use that are perceived as the "best bets" for improving rural livelihoods: bananas, maize, coffee, cotton, potatoes, sorghum, sugarcane, livestock production, unregulated lake fisheries, charcoal production, uncontrolled hardwood harvesting, tea estates, tobacco, fruit tree orchards (mango, avocado) and perennials (pineapple), game meat hunting, as opposed to other options for sustainable use and prescribed NRM best practices.

STRATEGIC OBJECTIVES

The mission has identified four strategic objectives (SO's), which collectively are aimed at providing assistance to address the high rate of population growth, low levels of education, the need to control and reduce the incidence of HIV/AIDS, malaria and infectious diseases, weaknesses in decentralization and governance, and to improve the prospects for food security, economic growth and increased industry competitiveness. Under the new USAID/Uganda Strategy Statement, there will be four Strategic Objectives (SOs). Two of the SOs from the 2002-2007 strategy will remain the same:

- SO7 "Expanded Sustainable Economic Opportunities for Rural Sector Growth" and
- SO8: "Human Capacity Improved"
- From SO9 (Democracy and Governance program), there will be two new SOs:
  - SO10 "Reinforce Uganda's Commitments to Pluralism and Good Governance"; and
  - SO11 "Mitigate Causes and Consequences of Conflict"

The mission will continue to use earmarked funds to contribute to the conservation of biodiversity and tropical forests through interventions related to poverty reduction, rural development and economic growth (mainly under SO7) as there is not a separate and stand alone SO for environmental and NRM programs.

SO7 EXPAND SUSTAINABLE ECONOMIC OPPORTUNITIES FOR RURAL SECTOR GROWTH:

This SO is associated with the following program components

- Improve private sector competitiveness
- Increase agricultural sector productivity

- Improve sustainable management of natural resources and biodiversity conservation

Collectively, these programs seek to increase rural incomes and improve livelihood opportunities in rural areas, while strengthening the private sector as the engine of economic growth and protecting Uganda's natural resource base.

These programs specifically aim to strengthen producer organizations and key commodity sub-sectors through the promotion of industry-wide competitive clusters and to address production constraints along agricultural commodity chains that provide income for a large percentage of rural households and have a high potential for increases in productivity and export, such as coffee, cotton, oilseeds, grains and fish. Strengthening of agricultural input service providers and the promotion of savings mobilization, the expansion of rural financial services and increased access to rural credit, along with actions promoting food security (especially in the north) and interventions designed to reduce losses from crop diseases and pests are also included.

The USAID/Uganda environment and biodiversity conservation interventions are designed to integrate support for NRM planning at the landscape level and CBNRM linked with environmental friendly income-generating opportunities (such as ecotourism, cropping systems that reduce damage to forests and wetlands, and eco-friendly coffee and other products). These activities are focused on the Albertine Rift in recognition of its importance for biodiversity and its status as a threatened hot spot. The mission aims to provide grants for in-service training and other support through partner organizations to UWA, NFA, NEMA and District level environmental offices, and forest offices to enable them to work more effectively with "frontline" communities bordering targeted Protected Areas. The mission also aims to strengthen democratic governance from the bottom up, through support for producer organizations and rural savings groups, and through assistance to community-based organizations and district offices in a position to affirm clearer rules and responsibilities governing the "rights of exclusion" and benefit distribution among communities committed to improved habitat management and wildlife conservation in and around protected areas.

SO8 HUMAN CAPACITY IMPROVED:

This SO includes 5 program components in an integrated approach:

- Equitable access to quality basic education
- Reduced transmission and impact of HIV/AIDS
- Prevention and control infectious diseases, especially malaria and TB
- Improve child survival, health and nutrition
- Support family planning

These programs collectively seek to reduce the vulnerability of Uganda's poor people by improving their levels of education and health. The programs aim to improve the effective use of basic social services (in health care and education), increase the capacity of public and private sector service providers and strengthen the policy environment and social support for service delivery. Special attention is being given to displaced populations and to supporting GOU commitment to improved education, health and control of HIV/AIDS. The program addresses infectious diseases by focusing on malaria, TB and HIV/AIDS. USAID support for the GOU national malaria program will include support for malaria treatment, promotion, sale and distribution of insecticide treated nets (ITNs) and select indoor residual spraying in epidemic prone districts. The use of DDT in residual indoor spraying is still contentious and could adversely affect Uganda's access to international markets (American and European) as well as the tourism industry. The educational efforts include support for improving the quality of basic, primary education especially among girls, peace education in conflict-affected areas and strengthening of school management.

SO10 MORE EFFECTIVE DEMOCRATIC GOVERNANCE

This SO is intended to address corruption, backsliding and reversal of progress with democratic reforms, and will take advantage of opportunities to strengthen civil society organizations (CSO). After several years of supporting government and political institutions (Parliament, Electoral Commission as well as political parties and civil society), as assessment of democracy / governance (D/G) programs revealed that programs results were difficult to achieve in the face of a lack of political will for reform at the highest levels of the GOU. The new strategy represents a shift to increase support to demand-side institutions, including political parties and CSO, the media, think tanks along with grass roots level interventions to raise public awareness and advocacy for reform, and to thereby help address politically-driven corruption, weak separation of powers and challenges to democratic competition and participation.

SO11 MITIGATE CAUSES AND CONSEQUENCES OF CONFLICT

This is a new, cross-cutting SO focused on mitigating the causes and consequences of conflict in Uganda. It may include support for food security, NRM, economic livelihoods, health and education, and D/G, in order to advance the peace and reconciliation process, help address the humanitarian crisis in the north and protect individuals from violence, increase access to health care, education and other essential services and assist with the restoration of basic economic activities in an environmentally sound and sustainable manner, including the improved management of woodlands for fuel and building materials and establishing effective controls on land use and natural resource exploitation.

The new USAID/Uganda strategy includes explicit attention to several cross-cutting themes which are addressed by more than one SO, including gender, attention to HIV/AIDS, democratic governance, youth (49% of the population is under 15 years old) and urbanization (Uganda is currently 85% rural).

COMMENTARY ON USAID COMPARATIVE ADVANTAGE

The USAID/Uganda Mission and USG are particularly well positioned to cooperate with a number of large, international NGOs with an interest in biodiversity conservation and sustainable development. These include WCS, WWF, AWF, CI, IUCN, JGI and others that are in a good position to leverage significant amounts of public and private sector funding as well as networks of capable professionals, scientists and dedicated field researchers in support of environmental programs and biodiversity conservation. The US can also effectively collaborate with and support the work of a number of PVO's and organizations working in humanitarian relief, health care, education and rural development, such as Africare, CARE and others.

USAID is also recognized for its ability to collaborate with and strengthen private sector operators, and to identify and support actions aimed at increasing the competitiveness of selected commodity chains and industries, stimulating investment by the private sector in these industries, expanded trade and associated economic growth.

Through the MCC, support for policy research institutes such as WRI and their local partners and other mechanisms, the US has also been effective in encouraging democratic reforms and a shift away from autocratic regimes to more democratic and accountable public institutions and good governance. With the active support and encouragement of a stronger and broader array of civil society organizations, local NGOs, CBOs, producer organizations and private sector groups, the US and other development assistance and international organizations can assist in countering tendencies to "abort" devolution of overly centralized authorities and to subvert the potential gains from a shift towards multi-party politics, democratization and progress with the development of more accountable and effective institutions of good governance.

To date, the Mission has used these advantages to good effect, and should continue to do so.

OPPORTUNITIES FOR SYNERGY AND FOR LEVERAGING PROGRAM IMPACT

The "Environmental Analysis" prepared by the USAID/Uganda NRM Advisor in December, 2005 reviews a number of environmentally-related concerns and issues associated with the proposed new Mission Strategy and SOs. A number of these issues were also highlighted in the 2001 ETOA and Biodiversity Assessment, such as:

- problems in acquiring good data on land use, and on the economic value of biodiversity and NRM related land use options
- need for strengthening of national institutions and capabilities to monitor changes in land use and habitat change, and to track the impacts of agricultural expansion
- need for continued screening and review of potential environmental impacts associated with the increased use of inputs for agricultural intensification, infrastructure improvements (especially roads), use of micro-finance and disposal of medical wastes
- opportunities to support certification of targeted products associated with improved NRM practices in order to increase their sustainable production and competitiveness in export markets
- need to strengthen land tenure and opportunities to increase tenure security and reduce conflicts over natural resources in connection with resettlement in the North

These and other opportunities that came to the attention of the assessment team are summarized below, in regard to each of the proposed new strategic objectives.

FOR SO7 (RURAL SECTOR GROWTH)

Continue to support program interventions in and around the Albertine Rift aimed at identifying and extending cost-effective and viable options to conversion of forest land to non-sustainable, extensive agricultural land use and to promote more sustainable forms of land use that provide for increased productivity of natural resources and greater economic benefits for local communities in tandem with resource protection and conservation of biodiversity;

Revisit current arrangements for sharing of tourism-related revenues, make use of assessments of revenue sharing experiences by WCS and others, and support reforms aimed at:

- increasing the percentage of funds that are "shared", to include a higher percentage of entry fees and a portion of other revenue and economic benefit streams generated by tourism in Uganda's protected areas and associated with the continued conservation of biodiversity (e.g. negotiated share of receipts from lodges, campsites, safaris and other ecotourism business)
- increasing the role and rights of local communities in decision-making regarding the use of shared revenues
- strengthening the measures aimed at providing for a greater degree of transparency and accountability in the use of shared revenues
- ensuring that the funds effectively benefit front line communities and rural populations that would otherwise be negatively impacted by PA management and tourism developments

Reinforce interventions designed to clarify and increase security of tenure over land and other natural resources and local participation in decisions affecting land use, with a view towards prompting greater local investment in the improved management and conservation of these resources, and more safeguards against ill-considered and unilateral expropriation or conversion of land to uses that are not sustainable and not in keeping with local priorities and national policy directives.

Expand work with land owners and rural producers to restore, rehabilitate cut-over, degraded forest, grazing and crop lands, and to develop multiple use, sustained yield management options involving the diversification and intensification of rural production systems (agroforestry, forestry, livestock, annual and perennial crops, natural products, wildlife, fisheries, tourism, etc.) in association with conservation of biodiversity outside of protected areas.

Mandate, support and encourage SO7 partners to work with one another and also with USAID assisted partners focused on achieving results for SO8, SO10 and SO11, to capitalize on opportunities to apply the principles and best practices identified in the NWP framework and to leverage greater and more sustainable program impacts through integration of approaches dealing with empowerment, rights and governance; economic incentives; and improved NRM practices.

This collaboration could be reinforced and supplemented by supporting an E/NR program unit that could help to compensate for the current lack of a program mechanism to address the environment as a "cross-cutting" issue.

FOR SO8 (HUMAN CAPACITY / HEALTH / EDUCATION / HIV)

- Monitor results and lessons learned from the "Conservation through Public Health" (CTPH) and AWF activities in Buhoma and apply / scale up as appropriate
- Ensure national and decentralized institutions are strengthened and that procedures and capacity are in place to monitor and apply recommendations from PERSUAP related to the use of pesticides for malaria control
- Consider impacts of HIV on labor intensive NRM practices and proposed best practices for sustainable use of natural resources
- Explore options to leverage Environmental Education activities supported by SO7 partners (JGI and others), SO8 D/G partners, CSOs and NGOs and in public schools.
- Consider targeting population /family planning activities to maximize potential synergies with landscape level SO7 interventions

FOR SO10 (DEMOCRACY/GOVERNANCE)

Consider how to reinforce collaboration between SO7 and SO10, so as to leverage additional support for CBNRM activities as an effective mechanism to support good governance, reduce conflicts and contribute to overall sustainable development objectives

Seek out opportunities to support CSO and NGOs working on good governance, particularly with respect to advocacy campaigns in support of environmental conservation and improved NRM as a foundation for sustainable and equitable economic development.

Explore prospective means to mobilize funding and support for capacity building among investigative reporting, policy research and advocacy organizations with a commitment to address issues of environmental governance and the linkages between biodiversity conservation, poverty reduction in rural areas and the empowerment / strengthening of rights / roles for local communities and user groups with a stake in the sustainable use and improved management of natural resources.

SO11 (CONFLICT RESOLUTION AND RESETTLEMENT IN THE NORTH)

Ensure widespread distribution of WCS study on the impact of the conflict in northern Uganda on E/NRM, particularly to members of the Prime Minister's Task Force preparing the Peace, Recovery and Development Plan (PRDP); consider needs to:

- update assessment of biodiversity hot spots, status of protected areas and endangered species, water resources distribution and availability, wood fuel stocks and utilization

- utilization of data and findings from district level SOE reports prepared with the support of NEMA
- assessment of land degradation and needs for restoration in/around IDP and military camps
- training of local leadership to raise awareness about E/NRM issues

Work with the Prime Minister's Office to facilitate the involvement of UWA, NFA, NEMA in planning for resettlement, so as to take account of surveys of biodiversity, prospects for renewed protection and improved management of forest reserves and other protected areas, and environmental management as a component of resettlement of IDP and development in the north; give particular attention to:

- the resolution of land tenure security for resettled populations
- provisions for environmentally sound land clearing practices and the management of soil fertility, and soil/water conservation, protection of ground water and the development of water resources as needed
- maintenance and renewal of wood fuel supplies and pasture / rangeland resources
- community level organization and training of local leadership in support of CBNRM
- measures to control land grabs, wildlife poaching, livestock theft, uncontrolled resource extraction, particularly through support for CBNRM land use plans and environmental ordinances

Work with SO7 and SO10 to resolve disputes, control sources of degradation and actions that have disempowered and impoverished local communities, and to find an equitable resolution to issues related to the long term management and sustainable use options in the Pian-Upe Wildlife Refuge.

Systematically identify and assess the most significant and threatened biodiversity and natural resources in the North and explore opportunities to collaborate with SO7 to support the establishment / management of at least three targeted transboundary Peace Parks

RECOMMENDATIONS

In addition to implementing the actions aimed at capitalizing upon potential synergies and leveraging greater program impact in relation to the USAID/Uganda program, (preceding section), the team recommends the following:

PRIORITIES IN THE SHORT TERM

Maintain the focus on the Albertine Rift as a biodiversity hot spot with opportunities for increased valuation of protected areas and other natural resources in ways that contribute to poverty reduction and improved welfare for local communities through the application of NWP principles and approaches; NWP fosters the application and integration of approaches along the lines being pursued by PRIME West, with it's support for landscape analysis and empowerment of local level decision making, CBNRM and capacity building for the adoption of improved practices, and support for value chains, enterprise development and increased competitiveness.

Reinforce the community conservation components of protected area management programs in frontline communities. UWA and NFA have effectively increased the size of the protected areas network and improved the management of Uganda's parks, wildlife and forest reserves, but these gains could be undermined through friction and discontent by surrounding local communities unless even more attention is paid to community outreach, environmental education and most significantly to a range of measures to sharply increase the level of economic benefits for local communities generated from conservation and protected areas. Higher levels of revenue sharing, increased range of revenue sharing modalities, more attention to increased employment opportunities and to the expansion of alternative income generating opportunities are needed.

Seek out opportunities to scale up program impacts over large areas, with an impact on a greater number of households. While USAID funded project interventions have been effective in targeted areas and have emphasized community mobilization and participatory processes which take time but enhance the prospects for longer term, sustainable impacts, there is a need to leverage lasting change more rapidly over larger areas and with greater numbers of people if biodiversity and tropical forests are to be conserved in advance of continued land clearing and extension of existing systems of rural production and land use. Larger scale impacts could be achieved through a greater emphasis on systematic training and capacity building with a large number of community based organizations; increased support to civil society organizations with the potential to mobilize public opinion and action over large areas and more attention to leveraging market based incentives, effective transfer of management rights to local communities and improved governance.

Increase support for CBNRM and community forestry interventions. In recent years, UWA, WID and NFA have worked to protect critically important wildlife habitats, wetlands and remaining areas of natural forest, however, there are still significant areas of natural forest, wildlife habitat and wetlands outside of the network of parks and central forest reserves. Unless CBNRM and community forestry interventions are rapidly organized in these remaining unprotected areas, there is a high likelihood they will be converted, cleared or degraded through unsustainable use. There is a rapidly closing window of opportunity to work with communities to establish sustainable land management systems in these areas that could contribute to biodiversity conservation and help to maintain the forest cover, wildlife habitat and wetlands that are important for the sustainable development of Uganda. Programs could be organized to capitalize on urban markets for a range of natural and agricultural products including relatively fast growing indigenous species such as *Maesopsis eminii*, and extension and education efforts could support community based land use planning, sustainable land use and improved NRM practices before these areas are converted and degraded. The district forestry services need to be strengthened if the 'private' forests are to be saved.

Develop a sustainable financing strategy and conservation finance program to ensure that UWA, NFA, NEMA, ITFC and local conservation programs will have the resources to continue; consider options to support payment for environmental services, carbon trading, increased allocations of revenues to local communities, and for fiscal policy reform in support of conservation and environmental management objectives (tax breaks for adoption of sustainable use and improved NRM practices; conservation easements; etc.)

Strengthen coordination and knowledge management among environmental management agencies (UWA, NFA, NEMA, Fisheries) at both the national and district / local levels; also, enhance collaboration and information sharing among SO7 projects and Uganda partner institutions through periodic retreats and team building sessions. Consider options to increase support for knowledge management, research networking and collaboration with university and training institutes; facilitate information sharing through support for collaboration on bi-annual SOE reports prepared by NEMA.

Support widespread distribution of the 118/119 Assessment among all Mission SO teams, and promote discussion of the report findings and recommendations, particularly with SO7 and SO11 projects and partners.

RECOMMENDED MEDIUM AND LONGER TERM INTERVENTIONS

Reinforce efforts aimed at donor coordination, especially with respect to periodic information sharing, evaluation and review of what's working, and reassessment of strategic priorities.

Continue mission wide environmental training and extend to all SO implementing agencies and partners and work with local partners to support awareness creation, advocacy capacity and applied research on environmental and related sustainable development issues.

Maintain support for strengthening of environmental management institutions, with particular attention to the sustainability of programs and interventions coordinated and supported by NEMA, UWA, NFA and the Wetlands Division.

Increase efforts to support land use planning, control soil erosion, ill-considered land use conversion and encourage optimal utilization of land resources through revisions to the Land Act and land use policy reforms.

Support biodiversity inventories and long term monitoring along with regular environmental and sustainable development reports in collaboration with Makerere University, NEMA and other institutions.

ANNEX 1 – STATEMENT OF WORK FOR THE ASSESSMENT TEAM

Objective of the Uganda Biodiversity and Tropical Forestry Assessment: To conduct a country-wide assessment of biodiversity and tropical forestry conservation needs and related issues for the purposes of complying with Sections 117, 118, and 119 of the Foreign Assistance Act of 1961, as amended, and Agency guidance on country strategy development, under ADS 201.3.4.11 and ADS 204.5. Based on this needs assessment, provide analysis of proposed actions under USAID's strategy to identify how they contribute to the conservation needs identified.

The Contractor shall perform the following activities:

- Pre-travel informational meetings and information gathering. Prior to traveling to the field, the contractor is expected to:
  - Hold meetings with the Bureau Environmental Officer (BEO) in the appropriate USAID Washington bureau to ensure full understanding of USAID environmental procedures, the role of the regional bureau in environmental compliance, and purpose of this assignment. This would include policy decisions and approaches that the BEO and agency environmental advisor are taking as per their authority under Reg. 216.
  - Gather and get acquainted with existing background information on Uganda such as the country's natural resources, geographical, ecological and biological specificities, current status of environment and biodiversity, institutional organization on entity and state level, key stakeholders and donors in environment and biodiversity, legislation related to the environment and biodiversity, and other relevant information required for the country assessment.
  - Meet or speak with key stakeholders or managers at the World Bank, USDA Forest Service, and U.S.-based NGOs including World Wildlife Fund, World Resources Institute, and Wildlife Conservation Society, or other organizations involved in biodiversity conservation in Uganda or relevant regional efforts.
- Field a team to conduct an overview and general analysis of the country's biodiversity and its current status. Upon arriving in Uganda the team will:
  - Meet with USAID/Uganda to get a solid understanding of Mission program goals and objectives under its proposed updated strategy statement; perspectives of this assignment and specific interests for the team, including advice and protocol on approaching USAID partners and host country organizations with respect to this assignment. The team shall be aware of sensitivities related to an assessment exercise (i.e., the potential for raising expectations, and the need to be clear about the purpose of the assessment) and respect Mission guidance. The team will discuss organizations to be contacted and any planned site visits with the Mission and coordinate as required. USAID/Uganda will facilitate meetings with other USAID Strategic Objective teams.
  - Hold meetings with donor organizations, NGOs, relevant government agencies, and other organizations that are knowledgeable about biodiversity and tropical forestry conservation or are implementing noteworthy projects and gather information locally.

- Conduct no more than three priority site visits, which would supplement understanding of USAID's program, or of biodiversity issues that arise in interviews and literature or would confirm information in previous assessments. One visit shall include the Ugandan Albertine Rift. The site(s) for the second (or third) field visit will be determined by the team during the assessment in consultation with USAID.

- Assess and summarize the needs for biodiversity and tropical forestry conservation in Uganda based on key threats and analysis of country, donor and NGO responses to meet these needs. Prepare a report on the status of biodiversity, tropical forestry and conservation efforts in Uganda and potential implications for USAID or other donor programming and environmental monitoring which shall define the actions necessary for conservation. The report shall include:

  - The current status of biodiversity, tropical forests, and water resources in Uganda based on current and available information.

  - Major ecosystem types, highlighting important, unique aspects of the country's biodiversity, including important endemic species and their habitats.

  - Descriptions of natural areas of critical importance to biodiversity conservation, such as forests and wetlands critical for species reproduction, feeding or migration, if relevant. Particular attention should be given to critical environmental services and non-commercial services they provide (watershed protection, erosion control, soil, fuel wood, water conservation and amenity and recreation). It will also summarize how current land tenure arrangements affect conservation in Uganda.

  - An overview table and map of the status and management of protected area system in Uganda including: an inventory of all declared and proposed areas (national parks, wildlife reserves and refuges, forest reserves, sanctuaries, hunting preserves and other protected areas).

  - The inventory will identify the institution responsible for the protection and management of each decreed area, its date of establishment, area, and the protection status of each (i.e., staff in place, management plan published, etc.) In addition to this summary of the current protection and management status of each protected area, an overview of the major threats and challenges facing protected areas in Uganda, including vulnerability of areas to predicted changes in climate, and a brief summary of any recognized economic potential of these areas (including productive assets, environmental services and recreation and tourism opportunities) should be provided.

  - Descriptions of plant and animal species that are endangered or threatened with extinction. Endangered species of particular social, economic or environmental importance should be highlighted and described, as should their habitats. Technical information resources such as the IUCN red list and their websites should be referenced for future Mission access as required. This section should not emphasize species counts, but look at the relation of endangered species and important habitat conservation areas and issues, and evaluate the pressure on those areas, including vulnerability to predicted changes in climate, and current efforts to mitigate pressures, including the participation and compliance with CITES and other international efforts.

  - Recent, current, and potential primary threats to biodiversity, whether they are ecological (i.e., fire, pests), related to human use (i.e., agriculture, contamination), or institutional (i.e., failed policy) or trans-boundary issues, as appropriate. These should emerge from a general assessment of national policies and strategies and their effectiveness, issues related to institutional capacity, trade, private sector growth, participation in international treaties, and the role of civil society.

  - Conservation efforts, their scope and effectiveness. This section also should include recent, current and planned activities by donor organizations that support biodiversity and tropical forestry conservation, identification of multilateral organizations, NGOs, universities, and other local organizations involved in conservation, and a general description of responsible government agencies. A general assessment of

the effectiveness of these policies, institutions, and activities to achieve biodiversity conservation should be included. Priority conservation needs that lack donor or local support should be highlighted.

- Analysis of the current legislation related to the environment and biodiversity. This section should include identification of laws related to protection and management of biological resources and endangered species. It should also point out any differences in laws that require further harmonization. This section should also review international treaties signed and ratified, as well as those that Uganda needs to sign in order to conserve and manage its biological resources more efficiently.
- An overview of the major biodiversity and tropical forest conservation activities of the commercial private sector to identify ways to better foster private sector alliances. Of interest are the norms and standards followed by those commercial entities most engaged in management and use of Uganda's tropical forests and tracts near protected areas, including tourism developers and coffee producers. Consideration of policies promoted by the key relevant governmental ministries should also be included.
- An assessment of how USAID's program and proposed country strategy meets the needs for biodiversity and tropical forestry conservation, consistent with Mission program goals and objectives, through strategic objectives other than environment. The assessment shall include recommendations on where U.S. comparative advantages and capabilities are likely to have the greatest impact. These issues and recommendations should be prioritized to identify those requiring the most immediate attention.

ANNEX 2 - BIBLIOGRAPHY

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ANNEX 3 – LIST OF USEFUL WEBSITES FOR FURTHER INFORMATION

ACODE	http://www.acode-u.org
Agricultural Productivity Enhancement Project	http://www.apepuganda.org
Albertine Rift Programme – WCS	http://www.albertinerift.org
Budongo Forest Project	http://www.budongo.org
Convention on Biological Diversity	http://www.biodiv.org
CITES	http://www.cites.org
EcoTrust	http://www.ecotrust.or.ug
Environmental Alert	http://www.envalert.org
Institute of Tropical Forest Conservation	http://www.itfc.org
IUCN	http://www.iucn.org
IUCN Red List (2006)	http://www.redlist.org
Makerere University	http://www.makerere.ac.ug
Ministry of Energy and Mineral Development	http://www.energyandminerals.go.ug
National Forestry Authority	http://www.nfa.org.ug
Nature Uganda	http://www.natureuganda.org
NEMA	http://www.nemaug.org
Ramsar Convention on Wetlands	http://www.ramsar.org
Sawlog Production Grant Scheme	http://www.sawlog.ug
Uganda Wetlands Programme	http://www.ugandawetlands.org
Uganda Wildlife Authority	http://www.uwa.or.ug
USAID/Uganda	http://www.usaid.or.ug
Volunteer Efforts for Development Concerns	vedco@infocom.co.ug
Wildlife Conservation Society - WCS	http://www.wcs.org
Woods Hole Research Center – forest mapping	http://www.whrc.org/africa

ANNEX 4 – SCHEDULE OF INTERVIEWS AND FIELD VISITS

Date	Individuals / Agencies Contacted and Scheduled Activities
April 26	Preliminary contacts with USAID/Washington, USDA/Forest Service, Wildlife Conservation Society, World Resources Institute, Conservation International, World Wildlife Fund
May 1	Meeting with Peter Veit, Dan Tunstall, WRI to discuss role of civil society, decentralization, poverty and ecosystem services mapping, E/NR issues, key contacts in Uganda
	Meeting with Oliver Pierson, Africa Region Coordinator, USDA/Forest Service International Programs to discuss USDA/FS work in the region
May 2	Meeting with Tim Resch, Africa Bureau, Mike McGahuey, EGAT/LRM team and Mary Rowan, EGAT/Biodiversity team; Uganda Desk Officer invited but unable to attend; to discuss assessment SOW, findings from field visits, useful documentation and contacts
	Team Leader - Departure from Washington, D.C. for Amsterdam
May 3	Winterbottom travel from Amsterdam to Nairobi to Entebbe
May 4	Initial meeting with Dr. Jody Stallings, SO7 NRM Advisor and Mission Environmental Officer, by Dr. Gerald Eilu, NRM/Biodiversity Conservation specialist and Bob Winterbottom, Team Leader/Tropical Forestry specialist to discuss Mission Strategy Statement and Statement of Work for the 117/118/119 Assessement, including key contacts and planned site visits
	Meeting with Dr. Andrew Plumptre, Director Albertine Rift Program, Wildlife Conservation Society to review WCS programs and perspectives
	Meeting with Norbert Henninger, World Resources Institute, to discuss data availability, work with Ugandan Bureau of Statistics and poverty mapping
May 5	Meeting with Kathelyne Craenen, Attaché for Development Cooperation, Belgian Embassy and Chair of Donor Group on Environment
	Meeting with Clive Drew, Managing Director, USAID/Uganda Agricultural Productivity Enhancement Program (APEP) to review project activities and perspectives on E/NR issues
	Discussion with Jim Seyler, PRIME West Chief of Party regarding plans for proposed site visits to SW and Western Uganda
May 6	Review work plan and schedule with Paul Crawford, SO7 Team Leader and Jody Stallings, USAID/Uganda
May 7	Document review; compilation of meeting notes
May 8	Meeting with Jim Seyler, COP for USAID/Uganda PRIME West project to exchange documents, confirm field visit schedule, discuss project implementation issues
	Meeting with USAID team leaders: SO11 Randy Harris, Kennedy, SO 10 Scott Dobberstein and PPD Liz Regan Kiingi to discuss 118/119 assessment and mission strategy
	Meeting with Jones Ruhombe, Steve Nsita, Xavier Mugumya, NFA to review policies and practice for collaborative forest management
	Meeting with Achilles Byaruhanga, Nature Uganda to discuss key areas for birdlife and conservation outside of PA
May 9	Meeting with Moses Mapesa Wafula, Executive Director, Uganda Wildlife Authority (UWA) to discuss assessment objectives and PA management issues
	Meeting with Mary Goretti Kitutu Kimono, NEMA, to discuss State of Environment reports and district assessments
	Departure via Masaka, Mbarara for Kabale (Prime West project office)

Date	Individuals / Agencies Contacted and Scheduled Activities
May 10	Meeting with Lane Krahl, PRIME West field office DCOP, Kabale
	Visit to Bwindi Alistair McNeilage and Aventino Ksangaki (WCS/ITFC) (not enough time to visit AWF/CTPH); travel from Ruhija to QENP via Kanungu, Ishasha; overnight in Queen Elizabeth National Park
May 11	Visit of work in Muhokya corridor and Lake George area with Jackson Mutebi, Agrippinah Namara and Panta Kasoma, Prime West and Robert Neema, UWA conservation officer, Kyambura
May 12	Visit of Kalinzu Central Forest Reserve and Robert Mugabe, Conservation Education Centre. Return via Kasese, Kabarole, Fort Portal, Kyenjojo, Mubende to Kampala (holiday – for Presidential inauguration)
May 13	Compile notes and initial drafting of findings
May 14	Continue with review of documents; conversation with Bruce Martin, private investor in hunting concession in Kabwoya near Lake Albert; having to deal with oil / gas exploration in wildlife area
May 15	Meeting with Onesmus Mugyenyi and Arthur Bainomugisha, ACODE to discuss case studies funded by PRIME West
	Meeting with Rose Nankya, EcoTrust, to discuss conservation financing strategies and pilot CFM efforts
	Email exchange with SO8 (Amy Cunningham regarding E/NR issues related to population / health / DDT spraying and linkages between SO7 and SO8).
	7:00 pm Informal exit briefing with Jody and Paul.
May 16	7:45 am IUCN Alex Muhwezi
	9:00 am NORAD Geir Hermasson
	11:00 am EU Margaret Kasekende and Christer Hermansson
	2:00 pm SCOPE John Engle
	3:30 pm Uganda Wildlife Society, Jacob Manyindo
	6:00 pm departure of Bob Winterbottom; return to US / IRG home office
May 18-19	Follow up with SO8; draft report

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ANNEX 5 – BIOGRAPHICAL SKETCHES OF THE ASSESSMENT TEAM MEMBERS

Dr. Gerald Eilu, NRM Specialist for the team, is Senior Lecturer of Forest Ecology/Biodiversity Conservation in the Department of Forest Biology and Ecosystems Management, Makerere University. In 2001, as part of the team that carried out the SO7 Assessment of Strategic Agriculture and Environment Options for USAID in Uganda, Dr. Eilu played a leading role in generating information on the status of biodiversity in Uganda, threats to biodiversity, concerns about the conservation of key species, and opportunities for sustainable use of biodiversity. Dr. Eilu has conducted biodiversity inventories and related surveys mainly in the Albertine Rift. Dr. Eilu has previously worked as Acting Director of the Budongo Forest Project where he worked with the local people in a number of activities of project aimed at promoting participation of local stakeholders in management of natural resources around Budongo Forest. He is involved in efforts geared towards enhancing the conservation of plant diversity on agricultural landscapes outside Protected Areas and has worked with local communities to develop management plans for wetlands and private forests. He has also conducted research on traditional farming and plant species diversity in agricultural landscapes of Uganda, and is involved in efforts geared towards enhancing the conservation of plant diversity on agricultural landscapes.

Bob Winterbottom, Assessment Team Leader, is a senior environmental planning and natural resource management expert who has worked to assess the impacts of environment / natural resource programs, analyse actions needed to conserve biodiversity and manage tropical forests, and to strengthen governments and institutions in developing countries over the past 30 years. He has extensive experience in the development of national-level sustainable rural development policies and strategies and in the design and implementation of community forestry and sustainable agriculture practices, national environmental action plans, tropical forestry action plans, desertification control plans, natural resource based enterprises and rural development initiatives and related programs in Bangladesh, Burkina Faso, Cameroon, Madagascar, Mali, Namibia, Niger, Rwanda, Senegal, Tanzania and Zaire.