



# USAID | UGANDA

FROM THE AMERICAN PEOPLE

## UGANDA ENVIRONMENTAL THREATS AND OPPORTUNITIES ASSESSMENT (ETOA)

Final ETOA Report



December, 2015

This document was produced for review by the United States Agency for International Development. It was prepared by ECODIT under the Uganda Environmental Threats and Opportunities Assessment (ETOA) Task Order under the REPLACE IDIQ.

# **UGANDA ENVIRONMENTAL THREATS AND OPPORTUNITIES ASSESSMENT (ETOA)**

## **Final ETOA Report**

December, 2015

Task Order Contract: AID-617-TO-15-00005 (REPLACE IDIQ: OAA-I-14-00016)

Cover photo: Elephants at Queen Elizabeth National Park in western Uganda, October 2015.  
Photo credit: Karen Menczer/ECODIT.

### **DISCLAIMER**

This report is made possible by the support of the American People jointly sponsored by the United States Agency for International Development (USAID) and the Government of Uganda. The authors' views expressed in this report do not necessarily reflect the views of the USAID or the United States Government.

## ACRONYMS AND ABBREVIATIONS

ADS	Automated Directives System
ASM	Artisanal/small-scale mining
AWF	African Wildlife Foundation
BINP	Bwindi Impenetrable Forest National Park
BMU	Beach Management Unit
CBD	Convention on Biological Diversity
CCD	Climate Change Department
CDCS	Country Development Cooperation Strategy
CDM	Clean Development Mechanism
CF	Community Forest
CFA	Cooperative Framework Agreement
CFM	Community Forest Management
CFR	Central Forest Reserve
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COMESA	Common Market for Eastern and Southern Africa
CWA/CWMA	Community Wildlife Area/Community Wildlife Management Area
DDP	District Development Plan
DEAPS	District Environmental Action Plan
DEO	District Environment Officer
DFS	District Forestry Service
DLG	District Local Government
DO	Development Objective
DRC	Democratic Republic of Congo
DSIP	Development Strategy and Investment Plan
DWRM	Directorate of Water Resources Management
EAC	East African Community
EIA	Environmental Impact Assessment
EMOS	Environmental Management for the Oil Sector
ENR	Environment/natural resources
ERICCA	Education and Research to Improve Climate Change Adaptation
ETOA	Environmental Threats and Opportunities Assessment
FAA	Foreign Assistance Act
FR	Forest Reserve
FSSD	Uganda Forest Sector Support Department (under the MWE)
FTF	Feed the Future

GDP	Gross National Product
GIZ	Deutsche Gesellschaft für Internationale
GMP	General Management Plan
GOU	Government of Uganda
GVTC	Greater Virunga Transboundary Collaboration
HCW	Healthcare waste
HuGo	Human-Gorilla
HWC	Human-wildlife conflict
IBA	Important Bird Area
ICCN	<i>Institut Congolais pour la Conservation de la Nature</i>
ICCTC	Inter-institutional Climate Change Technical Committee
IR	Intermediate Result
IRS	Indoor residual spraying
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
KP	Kyoto Protocol
KVNP	Kidepo Valley National Park
LFR	Local Forest Reserve
LMCA/LMNP	Lake Mburo Conservation Area/National Park
LPG	Liquefied petroleum gas
LUP	Land Use Plan
M&E	Monitoring and Evaluation
MAAIF	Ministry of Agriculture, Animal Industry, and Fisheries
MEMD	Ministry of Energy and Mineral Development
MERECIP	Mount Elgon Regional Conservation Program
MFCA/MFNP	Murchison Falls Conservation Area/National Park
MFPED	Ministry of Finance, Planning and Economic Development
MLG	Ministry of Local Governance
MoU	Memorandum of Understanding
MPS	Ministry of Public Service
MTWA	Ministry of Tourism, Wildlife and Antiquities
MWE	Ministry of Water and Environment
NAP	National Adaptation Plan
NAPAs	National Adaptation Programmes of Action
NARO	National Agricultural Research Organization
NBI	Nile Basin Initiative
NBSAP	National Biodiversity Strategy and Action Plan
NCCP	National Climate Change Policy
NDP II	Government of Uganda's Second National Development Plan

NEMA	National Environmental Management Authority
NFA	National Forestry Authority
NFTP	National Forest & Tree Planting (Act)
NGO	Non-Governmental Organization
NISSAP	National Invasive Species Strategy, Action Plan
NP	National Park
NSOER	National State of the Environment Report
PA	Protected Area
PES	Payment for Environmental Services
PGR	Plant genetic resources
PMA	Plan for Modernization of Agriculture
QECA/QENP	Queen Elizabeth Conservation Area/National Park
RDB	Rwanda Development Board
SAMUKA	Sango Bay-Musambwa Island-Kagera Wetland System
SMART	Spatial Monitoring and Reporting Tool
SOW	Statement of Work
REDD+	Reducing Emissions from Deforestation and Forest Degradation plus
TFR	Total Fertility Rate
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic and Health Survey
UNESCO	United Nations Education, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
USB	Uganda Bureau of Statistics
USAID	United States Agency for International Development
UWA	Uganda Wildlife Authority
WCS	Wildlife Conservation Society
WHO	World Health Organization
WMA	Wildlife Management Area
WMD	Wetlands Management Department
WPA	Wildlife Protected Area
WSSP	Wetland Sector Strategic Plan
WTTC	World Travel and Tourism Council
WWF	World Wildlife Fund

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>viii</b>
<b>1. INTRODUCTION .....</b>	<b>1</b>
1.1 PURPOSE OF THE UGANDA ETOA .....	1
1.2 METHODOLOGY .....	2
<b>2. COUNTRY CONTEXT .....</b>	<b>3</b>
2.1 BACKGROUND.....	3
2.2 BRIEF DESCRIPTION OF THE USAID PROGRAM.....	3
2.3 TIMING OF THE ETOA IN RELATION TO THE CDCS .....	4
<b>3. STATE OF THE ENVIRONMENT AND KEY NATURAL RESOURCES.....</b>	<b>4</b>
3.1 BIOPHYSICAL SETTING.....	4
3.2 MAJOR ECOSYSTEM TYPES .....	5
3.3 NATURAL AREAS OF CRITICAL IMPORTANCE .....	9
3.4 SPECIES.....	12
3.5 STATUS AND MANAGEMENT OF PROTECTED AREAS.....	15
3.6 STATUS OF KEY NATURAL RESOURCES OUTSIDE PROTECTED AREAS.....	20
<b>4. VALUES AND ECONOMIC POTENTIAL.....</b>	<b>21</b>
4.1 ECOSYSTEM GOODS AND SERVICES.....	21
4.2 NON-MATERIAL BENEFITS.....	24
<b>5. LEGAL, POLICY, AND INSTITUTIONAL FRAMEWORK .....</b>	<b>25</b>
5.1 NATIONAL LAWS, POLICIES, AND STRATEGIES.....	25
5.2 INTERNATIONAL TREATIES AND CONVENTIONS .....	27
5.3 KEY INSTITUTIONS.....	28
<b>6. THREATS TO BIODIVERSITY AND TROPICAL FORESTS.....</b>	<b>31</b>
6.1 PRIMARY THREATS TO UGANDA’S BIODIVERSITY AND FORESTS.....	31
6.1.1 Agricultural Expansion into Natural Ecosystems.....	31
6.1.2 Charcoal/Firewood Collection.....	32
6.1.3 Infrastructure Development: Urban Expansion, Energy Development, Mining.....	33
6.1.4 Illegal Activities: poaching (wildlife, fisheries, timber) and wildlife trafficking .....	38
6.1.5 Human-Wildlife Conflict.....	39

6.1.6	Pollution.....	39
6.1.7	Climate Change .....	40
6.1.8	Zoonotic Diseases.....	40
6.1.9	Invasive Species.....	41
6.1.10	Over-exploitation of Natural Ecosystems: especially forests, wetlands, rangelands, and fisheries .....	42
6.1.11	Transboundary Threats .....	43
6.1.12	Human-Induced WildFires.....	43
6.1.13	Modern Agricultural Practices Affect Agricultural Biodiversity.....	44
6.2	UNDERLYING CAUSES .....	44
6.2.1	Population Growth.....	44
6.2.2	Weak Governance, including weak implementation, conflicting and overlapping mandates .....	45
6.2.3	Limited opportunities for off-farm employment .....	46
6.2.4	Poverty.....	46
6.2.5	Insecurity of land tenure.....	47
6.2.6	Government policies that fail to promote conservation.....	47
6.2.7	Climate change.....	48
6.2.8	Poor perception of the value of natural ecosystems.....	49
<b>7.</b>	<b>ACTIONS NECESSARY TO CONSERVE BIODIVERSITY, TROPICAL FORESTS, AND THE ENVIRONMENT .....</b>	<b>49</b>
7.1	ACTIONS NECESSARY.....	49
7.2	EXTENT TO WHICH USAID IS ADDRESSING THE ACTIONS NECESSARY .....	56
<b>8.</b>	<b>OPPORTUNITIES FOR USAID/UGANDA.....</b>	<b>63</b>
8.1	BRIEF OVERVIEW OF USAID/UGANDA STRATEGIC APPROACH AND PRIORITIES.....	63
8.2	RECOMMENDATIONS BASED ON ACTIONS NECESSARY TO CONSERVE BIODIVERSITY, TROPICAL FORESTS, AND THE ENVIRONMENT .....	64
8.3	RECOMMENDATIONS BASED ON THE FAA I I7 ANALYSIS (ANNEX B) .....	68
<b>9.</b>	<b>REFERENCES.....</b>	<b>73</b>

## LIST OF ANNEXES

Annex A:	Scope of Work for the Uganda ETOA.....	A-1
Annex B:	FAA I I7 Analysis of the Country Development Cooperation Strategy (2016–2020) .....	A-6
Annex C:	Biographical Sketches of Team Members.....	A-13
Annex D:	List of Consultations .....	A-15
Annex E:	Key Changes and Updates from USAID/Uganda 2011 ETOA.....	A-21

Annex F: Biodiversity and Protected Areas .....	A-23
Annex G: Land Use and Biodiversity Outside Protected Areas (PAs) .....	A-28
Annex H: Conservation Efforts .....	A-33
Annex I: Policy/Legal and Institutional Frameworks.....	A-42
Annex J: Additional Figures .....	A-49
Annex K: Climate Change: indirect effects on biodiversity.....	A-51
Annex L: Uganda's Proposed Red List of Threatened Species .....	A-53

## LIST OF TABLES

Table 1: Trends in Loss of Forest Cover Over Time.....	6
Table 2: Wetlands in Uganda Recognized as Important Under the Ramsar Convention.....	11
Table 3: Trends in Large Mammal Populations in Uganda.....	12
Table 4: Recorded Flora and Fauna Species in Uganda & Conservation Status (as of 2015).....	14
Table 5: Conservation Status of Some Plants and Animals by 2008 .....	14
Table 6: Estimates of the Values of Ecosystems Services Contributed from MFCA and Budongo Forest Reserve.....	23
Table 7: Wetland Uses in Uganda.....	24
Table 8: International Treaties Ratified by Uganda Related to Biodiversity Conservation.....	27
Table 9: List of Invasive Alien Species of National Concern for Urgent Control.....	42
Table 10: Actions Needed to Address the Underlying Causes of Threats .....	49
Table 11: Extent to Which USAID Is Addressing the Actions Needed for Sustainable Forest Management and Biodiversity Conservation.....	56
Table 12: Overview of the Status of Wildlife Protected Areas.....	A-23
Table 13: Ecological Attributes of the Wildlife Corridors and the Major Threats.....	A-31
Table 14: Donor-Funded Conservation Efforts.....	A-36
Table 15: Bilateral and Multilateral Development Partners and Their Respective ENR Sub-sector Areas of Operations.....	A-39
Table 16: Maximum Change in Value Due to Climate Change Between Now and 2050.....	A-51
Table 17: Proposed National Redlist for Uganda: Evaluated Plant Species.....	A-54
Table 18: Proposed National Redlist for Uganda: Evaluated Mammal Species .....	A-64
Table 19: Proposed National Redlist for Uganda: Evaluated Reptile Species.....	A-94
Table 20: Proposed National Redlist for Uganda: Evaluated Bird Species.....	A-111



## LIST OF FIGURES

Figure 1: Map of Uganda’s Vegetation Types, 1964.....	7
Figure 2: Change in Uganda Forest Cover, 1990–2015 .....	8
Figure 3: Important Bird Areas (IBAs) in Uganda, 2010.....	11
Figure 4: Wildlife Protected Areas in Uganda .....	17
Figure 5: Map of Strategic Cities and Road Network, by 2040.....	34
Figure 6: Proposed and Ongoing Hydropower Projects Outside and Within PAs.....	36
Figure 7: Proposed and Existing Mining Sites Outside and Within PAs .....	37
Figure 8: Congress Weed in Queen Elizabeth National Park.....	41
Figure 9: Wildlife Protected Areas in Uganda .....	A-25
Figure 10: Central and Local Forest Reserves in Uganda .....	A-26
Figure 11: Uganda’s Wetlands and Other Aquatic Resources.....	A-27
Figure 12: Queen Elizabeth Conservation Area and Surrounding Wildlife Corridors.....	A-29
Figure 13: Land Cover in the Northern Albertine Rift of Uganda in 2012.....	A-29
Figure 14: Potential Wildlife Corridors Identified by GOU to Maintain PA Connectivity in the Northern Albertine Rift .....	A-30
Figure 15: Pie Chart Showing the Percentage of Donor Support to ENR Sub-sectors .....	A-35
Figure 16: Illegal Activities in Budongo CFR.....	A-49
Figure 17: Illegal Activities in Kalinzu CFR.....	A-49
Figure 18: Major Routes of Illegal Timber, Charcoal, and Wildlife Trade Across Borders within the Greater Virunga Landscape.....	A-50

# EXECUTIVE SUMMARY

## BACKGROUND

Uganda lies on the northwestern shores of Lake Victoria and occupies most of the Lake Victoria Basin, which was formed by the geological shifts that created the Rift Valley during the Pleistocene era. The plateau that stretches northward from Lake Victoria declines gradually to an altitude of 914 meters on the Sudan border. The gradually sloping terrain is interrupted by a shallow basin dipping toward the center of the country and small areas of tropical forest, which mark the western border with the Democratic Republic of Congo (DRC).

Four of east Africa's Great Lakes—Lake Victoria, Lake Kyoga, Lake Albert, and Lake Edward—lie within Uganda or on its borders. Lake Victoria is the second largest inland freshwater lake in the world (after Lake Superior in the US); it feeds the upper waters of the Nile River, which is referred to in this region as the Victoria Nile.

Uganda's biodiversity is one of the highest on the African continent. 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.

Forests are estimated to cover 3.3 million hectares (ha), or 16 percent of the total area of the country; forest cover has declined from 4.9 million ha in 2001 (NEMA, 2015). Of the total area of forests, 36 percent are in Protected Areas (PAs include forest reserves, national parks, and wildlife reserves), whereas 64 percent are found on private and customary land.

Uganda is estimated to be losing its forest cover at a rate of 80,000 hectares per year. Between 1890 and 1990, the area of forest and woodland has declined from 45 percent to 20 percent of total land surface (NFA, 2011, in NEMA, 2015). The majority of forest loss has occurred outside of PAs and is largely due to conversion of forest lands to agriculture and overharvesting of wood for firewood and charcoal (NFA, 2011, in NEMA, 2015).

Approximately 20 percent of the surface area of Uganda is covered by aquatic systems comprising five major lakes (Victoria, Albert, Kyoga, Edward, and George), the Kazinga Channel, about 160 minor lakes, an extensive river system, dams, and ponds (NEMA, 2015). These aquatic systems are usually fringed with extensive wetlands or swamps (NEMA, 2012).

According to Uganda's wetland mapping exercise of 2008 (the most recent, reliable data), wetlands covered about 37,575.4 km<sup>2</sup> (15.6 percent) of the total surface area of Uganda in 1994, but by 2008, this area had reduced to 26,307.7 km<sup>2</sup> (10.9 percent) (NFA, 2009; MWE, 2012, in NSOER, 2014; the National State of the Environment Report—NSOER—is the 2012 report but it was finalized in 2014). Wetland Department officials consulted for this report stated that this area has decreased even further due to ongoing encroachment, mainly for agricultural production and infrastructure development (current estimate is about 10 percent).

The Albertine Rift or Africa's Western Rift Valley contains more than half of Africa's birds, 40 percent of Africa's mammals, and about 20 percent of its amphibians and plants. It contains more vertebrate species than anywhere else on the continent. It also provides habitat for more threatened and endemic species than any other region of Africa. The Albertine Rift ecosystems face significant threats. Human population density in the Albertine Rift is high with more than 1,000 people per square kilometer (km<sup>2</sup>) in some areas of the Rift, with some of the poorest people on the continent. It has been a region of great conflict over the past 40 years. In Uganda, threats related to high human population and poverty are exacerbated by ongoing and proposed mining, oil and gas exploration and production, and other infrastructure development.

## **UGANDA'S PA SYSTEM**

Uganda has 10 National Parks and 12 Wildlife Reserves; the numbers have remained unchanged since the 2011 USAID/Uganda Environmental Threats and Opportunities Assessment (ETOA). A National Park and Wildlife Reserve, as defined under the Wildlife Act, is an area of national and international importance because of its biological diversity, landscape, or national heritage. These areas are managed by the Uganda Wildlife Authority (UWA), which was established in 1996 as a merger of the Game Department and Uganda National Parks.

Uganda's Forest Reserves (FR) may be managed under three authorities: the Uganda National Forestry Authority (NFA), charged with management of Central Forest Reserves (CFR); the District Forestry Services, in charge of Local Forest Reserves (LFR) with oversight of community forests; and dual management by NFA and UWA of FRs that overlap with wildlife PAs. Many of Uganda's LFRs have been heavily encroached and severely degraded, and in some cases they have been degazetted and allocated for infrastructure development by the local governments.

## **BIODIVERSITY OUTSIDE PAS**

According to African Wildlife Foundation (AWF, 2014), most wildlife in many parts of Uganda spend more time outside PAs, which were traditionally dispersal areas and wildlife corridors. However, historic wildlife migration corridors have been encroached and migrations of large mammals have been interrupted. Most large mammals in Uganda range beyond PA boundaries and are at risk of being trapped, poisoned, and hunted. Chimpanzees and other primate species use riverine forests, often outside PAs, as resting and hunting grounds. However, forest habitat outside PAs is fragmented due to harvesting for fuel wood and for poles and other infrastructure uses, and this is affecting chimpanzee populations and behaviors (pers. comms., October 2015).

As mentioned, the bulk of Uganda's forests (64 percent) are located on private land (NFA, 2011) outside PAs. The rate of decline of forest cover is 1.8 percent per year (NEMA, 2012), equivalent to 2.2 percent in private forests and 0.9 percent in PAs.

Aquatic biodiversity is, to a large extent, outside the PA system. Uganda's aquatic biodiversity consists of lakes (46,900 km<sup>2</sup>), swamps (7,300 km<sup>2</sup>), and rivers (2,000 km<sup>2</sup>), as well as wetlands, and the plant and animal life that relies on this habitat. Aquatic biodiversity suffers direct human impacts as communities exploit it for their sustenance.

Several studies of economic valuations of natural resources have been undertaken (Muramira and Emerton, 1999; Moyini and Muramira, 2001; and more recently WCS, 2013); however, a considerable gap remains on valuation of ecosystems, which is important for informed decision making in regard to investment in the environment/natural resource (ENR) sector and infrastructure developments.

## **BACKGROUND: ENVIRONMENTAL LEGAL AND INSTITUTIONAL FRAMEWORKS**

As was the case when the 2011 ETOA was prepared, the ENR sector policies, legislation, plans, and strategies are fairly comprehensive in their coverage of the sector. Of those consulted for this ETOA, experts agreed that Uganda has made considerable progress in putting in place the necessary institutional arrangements, legal and policy frameworks, and conservation programs consistent with the Convention on Biological Diversity (CBD) obligations under Article 8. Some of the milestones include local community participation in PA management and revenue sharing with local communities. Consultations during this ETOA and the joint sector review (MWE, 2015) point to persistent challenges of inadequate financing to implement the ENR policy and the regulatory framework.

As part of a broader decentralization process in Uganda, since 1996, ENR management outside of centrally managed PAs has been decentralized and entrusted to District Local Governments (DLGs). Decentralization is intended to increase local ownership and improve implementation of environmental policies, laws, and regulations. However, many districts are facing challenges in implementation due to issues with reporting channels, political interference, and challenges in mainstreaming and funding.

The main Government of Uganda institutions involved in the biodiversity sector are:

**Uganda Wildlife Authority (UWA):** Over the past decade, UWA has been considered one of the most successful conservation agencies on the continent.

**The National Forestry Authority (NFA):** Although NFA capacity and transparency have increased over the last decade (since the transition from Forest Department to an Authority), the NFA continues to be plagued by inefficiencies and ineffectiveness.

**The Forest Sector Support Department (FSSD):** The FSSD is facing challenges, mainly related to weak technical capacity and limited financial resources to implement the FSSD mandate.

**District Forestry Services (DFSs):** Not all districts have formed a DFS. DFSs are technically weak.

**The Wetlands Management Department (WMD):** The WMD has built the capacity of local governments to assess wetland resources, and to plan and implement activities for proper management. Nonetheless, all the district wetland inventories are due for updates, which are needed for planning, decision making, and development of district wetland action plans and management plans.

**The National Environment Management Authority (NEMA):** Over the last five years, NEMA approved a total of 2,087 project-level EIAs out of a total of 3,533 projects for which EIA reports were submitted (MWE, 2015). Although NEMA is mandated to ensure compliance in the implementation of EIA, the number of staff who actually conduct compliance inspections is inadequate to implement this mandate. Staff are also constrained by limited technical and financial capacities. The situation is exacerbated due to weak coordination between NEMA and many of the lead agencies responsible for environmental matters (e.g., agencies described in this section).

## **OVERVIEW OF CONSERVATION EFFORT**

The State of the Environment Report for Uganda 2012 (2014) notes that since the 2005/06 financial year, the GOU budgetary allocation for biodiversity conservation related investments at the national level have increased. GOU investments have increased from US\$20 million to US\$27.7 million for tourism and wildlife and from US\$65 million to US\$82 million for water and environment. (Note: A component of this investment is from on-budget project support through donor projects; this does not include USAID support.)

The NSOER (2014) describes a key issue for the environment sector: The GOU fails to give it financial priority as compared with other sectors. Environmental authorities and activities receive considerably smaller allocations than other sectors. The NSOER further notes that in some cases, when finances are short, the environment sector is the first to lose its budget to other priorities. “At the national level, for example, financing was transferred from the environment to the education sector to sponsor free education” (NSOER, 2014).

According to the NSOER (2014), budget support for tourism and wildlife from donors decreased from US\$11.2 million in 2005/6 to US\$4.7 million in 2011/12. (This amount only includes donors that provide direct budget support to the GOU; USAID’s contribution is not included.)

## SUMMARY OF THREATS

Based on consultations, document review, site visits, and internal Team discussions, the ETOA Team identified the threats below in order of priority as the primary threats to Uganda's biodiversity and forests.

1. **Agricultural expansion into natural ecosystems:** Between 1990 and 2005, agricultural land area expanded by 2 percent (from 8,400,789 ha to 8,847,591 ha, mostly in the form of small-scale agriculture (NFA, 2011, in NEMA, 2015)). Agricultural expansion remains a major deforestation driver in Uganda.
2. **Charcoal/firewood collection:** Biomass is the dominant energy resource for households as well as for small- and medium-scale industries such as lime, brick, and tile making and a number of agro-based industries; 92 percent of Uganda's energy needs are met from woody biomass (NEMA, 2014a). Fuel wood currently contributes more than 96 percent of energy for cooking in Uganda (NEMA, 2014b).
3. **Infrastructure Development-urban expansion, energy development, mining:** Urbanization and industrialization have exerted pressure mainly on peri-urban FRs and wetlands for expansion of urban and industrial centers. Hydropower, oil and gas development, both large-scale commercial mining and artisanal/small-scale mining are affecting biodiversity inside and outside of PAs.
4. **Illegal activities: poaching (wildlife, fisheries, timber) and wildlife trafficking:** Illegal activities affecting biodiversity inside and outside PAs and in wetlands and water bodies include hunting for subsistence, commercial trading of wildlife and wildlife products (meat, skins, and other trophies), pitsawing, and fishing. The animals most affected by poaching are elephants killed for ivory; hippos mainly for meat; sitatunga and other antelope for subsistence consumption; and pangolins for their skins.
5. **Human-wildlife conflict:** Human-wildlife conflicts are becoming widespread, frequent, and severe, including in areas where they previously had not occurred.
6. **Pollution**
7. **Climate change**
8. **Zoonotic diseases**
9. **Invasive species**
10. **Over-exploitation of natural ecosystems-especially forests, wetlands, rangelands, and fisheries**
11. **Transboundary threats**
12. **Human-induced wildfires**
13. **Modern agricultural practices affect agricultural biodiversity**

The following are the underlying causes of the biodiversity threats above, presented in order of their importance as underlying causes.

1. **Population growth:** Underlying cause of agricultural expansion; charcoal/firewood collection; infrastructure development; illegal activities; human-wildlife conflict; diseases/zoonotics; and over-exploitation of resources
2. **Weak governance, including weak implementation, conflicting and overlapping mandates:** Underlying cause of agricultural expansion; charcoal/firewood collection; infrastructure development; illegal activities; human-wildlife conflicts; pollution; climate change; invasive species; diseases; over-exploitation of resources; and transboundary threats; human-induced fire

3. **Limited opportunities for off-farm employment:** Underlying cause of agricultural expansion; charcoal/firewood collection; illegal activities; human-wildlife conflict; and over-exploitation of resources
4. **Poverty:** Underlying cause of agricultural expansion; charcoal/firewood collection; illegal activities; human-wildlife conflict; and over-exploitation of resources
5. **Insecurity of land tenure:** Underlying cause of agricultural expansion; charcoal/firewood collection; and over-exploitation of resources
6. **Government policies that fail to promote conservation:** Underlying cause of agricultural expansion; infrastructure development; charcoal/firewood collection; pollution; and over-exploitation of resources
7. **Climate change:** Underlying cause of agricultural expansion; charcoal/firewood collection; infrastructure development; illegal activities; human-wildlife conflicts; invasive species; diseases; over-exploitation of resources
8. **Poor perception of the value of natural ecosystems:** Underlying cause of infrastructure development; illegal activities; and over-exploitation of resources

### **ACTIONS NEEDED AND EXTENT TO WHICH USAID IS ADDRESSING THE NEEDS**

This section of the report addresses Foreign Assistance Act (FAA) Sections 118 “Tropical Forests” and 119 “Endangered Species,” which are specific legal requirements. Based on the ETOA Team’s review of key documents; on consultations with government, NGOs, university staff, and other experts; site visits; and on internal ETOA Team discussions, the ETOA Team developed a list of actions needed to address the threats and their underlying causes. The actions needed may be implemented by the GOU, private sector, donors, or other stakeholders. Based on USAID/Uganda’s Country Development Cooperation Strategy and activity descriptions, the ETOA Team identified the extent to which current or proposed USAID actions meet the needs.

### **SUMMARY OF RECOMMENDATIONS**

This report provides 19 recommendations, nine of which are considered critical for biodiversity conservation in Uganda and are summarized below.

1. Since Uganda’s high population growth rate is the main underlying cause of threats to biodiversity, under DO 2, USAID should implement family planning programs in underserved areas surrounding PAs and other critical and threatened natural ecosystems.
2. Under DO 3, USAID should support vulnerable communities adjacent to PAs to establish rural livelihood activities that combine climate change resilience and alternatives to subsistence agriculture. (This recommendation could be integrated with Recommendations 3, 4, 5, and 6 below.)
3. Under DO 1 and DO 3, USAID should promote the establishment and operation of conservancies and community wildlife areas/local reserves, game ranching, and private reserves to provide alternative livelihood options in areas adjacent to PAs and other areas with important biodiversity.
4. Under DO 3, USAID should support the conservation and management of key wildlife corridors, where considerable biodiversity exists outside the PA system.
5. Under DO 1 and DO 3, USAID should support collaborative management of forests, wetlands, and wildlife conservation areas to encourage sustainable management.

6. Under DO 3, USAID should promote alternative energy, as well as charcoal and fire wood production, as a sustainable enterprise.
7. Under DO 1 and DO 3, USAID should establish an EIA capacity-strengthening program for sector lead agencies, including local governments, NEMA, districts, and national EIA practitioners on planning, developing mitigation measures, monitoring, environmental management of different types of infrastructure development, and environmental audits (for developments inside and outside of PAs).
8. Under DO 1, USAID should support the GOU's efforts to combat illegal trafficking of natural resources, including wildlife and timber by, among other initiatives, strengthening law enforcement capacity of relevant institutions, especially NFA and UWA, to undertake patrols to detect and control illegal activities (This could involve support for SMART (Spatial Monitoring and Reporting Tool) inside and outside of PAs, ensuring that the entire SMART approach is integrated—not only data collection, but adaptive management at PA and national levels.).
9. Under DO 1, USAID should strengthen the capacity of UWA's Human-Wildlife Conflict Unit, including providing training and equipment for PAs to manage problem animals. To complement UWA efforts in HWC management and build capacity for DLGs to manage problem animals, USAID could promote the establishment of wildlife scouts to engage in HWC and wildlife-related management programs. Under DO 1, USAID could strengthen the PA revenue-sharing system, building greater transparency and citizen input into the process. This would help minimize conflicts between communities and PAs and would help motivate communities adjacent to PAs to protect wildlife.

The USAID/Uganda ETOA also includes an FAA 117 analysis, which identifies the potential impacts of proposed development activities—at CDCS level—on the environment and natural resources and presents opportunities to strengthen ENR interventions with an emphasis on cross-cutting cutting opportunities. It also recommends mitigation measures that can be integrated into the USAID/Uganda CDCS and follow-on programs, projects, and activities.



# I. INTRODUCTION

This Environmental Threats and Opportunities Assessment (ETOA) Final Report is the fourth deliverable under the USAID/Uganda ETOA contract with ECODIT. This report has been prepared in accordance with the Statement of Work (SOW) for the USAID/Uganda ETOA and meets the Foreign Assistance Act’s (FAA) legal requirements (FAA 117, 118, and 119, as amended).

## I.1 PURPOSE OF THE UGANDA ETOA

The purpose of this USAID/Uganda ETOA, as stated in the Task Order SOW (**Annex A** contains an annotated SOW) is to:

- 1) Conduct a country-wide assessment of biodiversity and tropical forest conservation needs and related issues for the purposes of complying with Sections 117, 118, and 119 of the Foreign Assistance Act (FAA) of 1961, as amended, and USAID guidance on country strategy development, described in Automated Directives System (ADS) Chapters 201.3.4.1, 201.3.4.2, and 204.
- 2) Identify important issues and risks related to environmental conditions and threats that USAID/Uganda must be aware of as it implements its Country Development Cooperation Strategy (CDCS), along with opportunities to integrate environmental considerations into existing or planned Mission activities in key technical sectors.

FAA Sections 118 “Tropical Forests” and 119 “Endangered Species” are specific legal requirements for all USAID operating unit strategic plans and require that all country plans include:

- An analysis of the actions necessary to conserve tropical forests and biodiversity (discussed in **Section 7.1**); and
- The extent to which current or proposed USAID actions meet the needs (discussed in **Section 7.2**).

According to FAA Section 117 “Environment and Natural Resources,” it is mandatory for operating units to implement their programs with an aim to maintain (and restore) natural resources upon which economic growth depends, and to consider the impact of their activities on the environment. The legal requirements of FAA 117 are reflected in USAID’s ADS Chapter 204 and in 22 Code of Federal Regulations (CFR) 216, USAID Environmental Procedures, and are meant to “ensure that environmental factors and values are integrated in A.I.D. decision making processes.” As required in the Task Order SOW, the FAA 117 analysis will determine the potential impacts of proposed development activities—at CDCS level—on the environment and natural resources. (**Annex B** addresses FAA 117.)

As USAID/Uganda moves toward more integrated development objectives (DO) under its new CDCS (see **Section 2.2**), the Mission recognizes the need to examine potential opportunities for innovative strategic approaches to address these threats as they relate to major programmatic areas and presidential priorities. The FAA 118/119 Assessment takes into account the integrated nature of USAID/Uganda’s technical sector, and the strategy-level environmental review (FAA 117) further helps strengthen cross-sectoral linkages. The ETOA highlights opportunities to build linkages between natural resource and environmental conservation and priority development themes identified in the CDCS and the Government of Uganda’s Second National Development Plan (NDP II).

An ETOA was prepared in 2001, followed by an FAA 118/119 Biodiversity and Tropical Forest Assessment in July 2006, and an ETOA in 2011. As noted in the SOW for this ETOA Task Order, since 2011, a number of relevant developments have taken place that affect Uganda’s biodiversity and require further scrutiny. A



summary of the key changes since 2011 relevant to biodiversity conservation is included in **Annex E**. This ETOA builds on the 2011 assessment and emphasizes changes in the environment/natural resources (ENR) sector since the last ETOA was conducted.

## **I.2 METHODOLOGY**

In accordance with the Task Order SOW, a four-person team conducted the USAID/Uganda ETOA (biographical sketches of team members are in **Annex C**):

- Karen Menczer, Senior Biodiversity Conservation Specialist/Team Leader
- Eunice Nyiramahoro Duli, Natural Resources and Environmental Management Specialist
- Jane Bemigisha, Climate Change and Sustainable Development Specialist
- Patrick Byakagaba, Forestry and Land Use Specialist
- ECODIT Home Office Support

To accomplish the Task Order SOW, the ETOA Team undertook the following tasks:

- Collection and review of relevant literature (national policies, action plans, reports, laws, and other key documents);
- Stakeholder consultations (in Washington, DC, and Uganda) with ENR sector and other relevant USAID partners and donors, national and district governments, non-governmental organizations (NGOs), and local communities (the list of individuals consulted for this ETOA is in **Annex D**); and
- Site visits.

To conduct site visits, the ETOA Team split into two groups and visited the following locations:

### **1. Team West/Central:**

- Lake Mburo Conservation Area (LMCA): National Park and Conservancy
- Kalinzu Central Forest Reserve (CFR), National Forestry Authority (NFA), and Collaborative Forest Management (CFM) group
- Kasese-Bukonzo Joint Coffee Cooperative washing stations, producer groups, and coffee producers
- Queen Elizabeth Conservation Area (QECA) staff
- Budongo CFR: Sector Manager and Range Manager
- Murchison Falls Conservation Area (MFCA) staff
- Masindi District Local Government (DLG)

### **2. Team Northeast (Lake Kyoga, Kotido, Kaabong, and Kidepo):**

- USAID Indoor Residual Spraying (IRS) project: Serere District and fishing village
- Kotido DLG, Mercy Corps (Nakaal Mother Care Group perma-gardens, St. Monica perma-gardens, agro-input dealer/farmer, livestock kraals)
- Kidepo Valley National Park (KVNP), USAID/African Wildlife Foundation (AWF), Uganda Biodiversity Conservation Program
- Kaabong DLG
- Karenga and Lobalangit Subcounties (Community Wildlife Management Area)

The ETOA Team held internal discussions to synthesize findings from key documents and discuss outcomes of meetings and site visits. Based on these discussions and analyses, the ETOA Team identified the primary threats to biodiversity and tropical forest conservation, underlying causes of the threats, actions needed to address the threats, and recommendations to USAID.

## 2. COUNTRY CONTEXT

### 2.1 BACKGROUND

Uganda is a landlocked country that lies astride the equator between 4°N and 1°S and from 29.5°W – 35°W. It covers an area of 236,000 square kilometers (km<sup>2</sup>) comprising 194,000 km<sup>2</sup> of dry land, 33,926 km<sup>2</sup> of open water, and 7,674 km<sup>2</sup> of permanent swamp (Langdale-Brown et al., 1964; Langlands, 1973, in NEMA, 2015).

According to the Uganda Bureau of Statistics (UBOS, 2013), in 2012, the average monthly rainfall for all population centers was more than 100 millimeters except Mbarara (98.3 mm) and Kasese (70.6 mm). In 2013, Kampala, Lira, and Soroti recorded higher rainfall above their long-term annual averages. Kasese, Masindi, Mbarara, and Tororo recorded rainfall below their long-term annual averages (UBOS, 2014).

The long-term minimum temperature (2008–2012) for select population centers showed that Jinja and Kasese had the lowest minimum temperature in the last five years, whereas Kampala had the highest mean minimum temperature (UBOS, 2013).

According to the Uganda Bureau of Statistics (UBOS, 2010), Uganda's human population in 2015 is estimated at 37.9 million; in 2009 it was 30.7 million. Population density has increased from 133 people/km<sup>2</sup> in 2009 to 174 people/km<sup>2</sup> in 2014 (UBOS, 2014). The population growth rate is 3.2 percent/year which translates to an annual increase of 1 million people. (Population data is based on the 2002 census.)

The urban population in Uganda increased from fewer than 1 million people in 1980 to about 3 million in 2002, representing a nearly fourfold increase (UBOS, 2013). Between 2002 and 2013, the urban population rapidly increased to about 6.4 million (estimate). This increase is mainly attributed to the creation of new urban administrative units, natural growth, demographic factors (excess of fertility over mortality), redefinition of the boundary of urban areas, and to a lesser extent, rural-urban migration.

Fertility levels were high over the three decades up to 2006, with the Total Fertility Rate (TFR) of about seven children/woman. TFR has reduced to 6.2 children per woman (2011 UDHS in UBOS, 2013). Fertility levels are higher in the rural areas compared to the urban areas: 6.8 and 3.8 respectively (UBOS, 2013).

Uganda's poverty rate has progressively declined from 38 percent in 2002–2003 to 31 percent in 2005–2006. Approximately 8.4 million people in the country are considered poor and about 7 million are trapped in chronic poverty (UBOS, 2010).

### 2.2 BRIEF DESCRIPTION OF THE USAID PROGRAM

USAID/Uganda is in the process of developing a new five-year Country Development Cooperation Strategy (CDCS) covering the period from 2016 through 2020. The new CDCS aims to address major development challenges through integrated approaches that bring different together technical sectors to achieve common objectives. Accordingly, the CDCS's DOs, rather than formed around technical sectors, reflect this integrated approach:

- DO 1: Key systems more accountable and responsive to Uganda's development needs

- DO 2: Demographic drivers affected to contribute to long-term trend shifts
- DO 3: Community and household resilience in select areas and target populations increased

Together, these DOs will contribute to achievement of the five-year goal: *Uganda’s systems are improving education, health, and economic outcomes.*

DO 1 includes activities that promote citizen participation in decision making; improved accountability and greater transparency at all levels of government; a strengthened work force, including a focus on building leadership skills; improved availability and use of data for decision making; and an enabling environment that supports functional systems, including policies, processes, and capacities.

DO 2 covers activities aimed at increasing reproductive health services and the adoption of reproductive health practices; improved child well-being, including health, nutrition, and general child protection services; an improved environment that promotes girls’ education; and youth productivity, strengthening productive skills, and economic opportunities.

DO 3 focuses on increasing and diversifying assets at household and community levels, including sustainably managing natural resources; strengthening capacity to manage risks, which takes into consideration risks related to climate change; and minimizing vulnerabilities by addressing behaviors, food security, HIV, malaria and other epidemics, planning, and literacy.

**Annex B** contains more information about the CDCS, including a strategy-level assessment of potential environmental impacts and suggested mitigation (the FAA 117 Analysis).

## **2.3 TIMING OF THE ETOA IN RELATION TO THE CDCS**

USAID/Uganda intends this ETOA to provide “critical analysis to inform the elaboration of these multi-dimensional and cross-cutting development objectives, as well as assist in the prioritization and coordination of USAID/Uganda and other donor resources for greatest development impact and sustainability.”

During elaboration of the ETOA, the CDCS was in draft stage and the Mission was only able to provide the draft CDCS Results Framework to the ETOA Team; the draft CDCS narrative was not available at the time.

Given the timing of the ETOA in relation to the CDCS, the ETOA has the potential to inform USAID strategy, as well as project design.

# **3. STATE OF THE ENVIRONMENT AND KEY NATURAL RESOURCES**

## **3.1 BIOPHYSICAL SETTING**

Uganda lies on the northwestern shores of Lake Victoria and occupies most of the Lake Victoria Basin, which was formed by the geological shifts that created the Rift Valley during the Pleistocene era. The plateau that stretches northward from Lake Victoria declines gradually to an altitude of 914 meters on the Sudan border. The gradually sloping terrain is interrupted by a shallow basin dipping toward the center of the country and small areas of tropical forest, which mark the western border with the Democratic Republic of Congo (DRC).

Both eastern and western borders are mountainous. The Rwenzori Mountains (often called the Mountains of the Moon) form about 80 kilometers of the border between Uganda and the DRC. The highest peaks are Margherita (5,113 meters) and Alexandra (5,094 meters). Farther south, the northernmost of the Mufumbiro volcanoes reach 4,132 meters on Mount Mahavura; 3,648 meters on Mount Mgahinga; and 3,477 meters on Mount Sabinio, which marks the border with Rwanda and the DRC.

Dominating the eastern border with Kenya, roughly 120 kilometers north of the equator, is Mount Elgon, an extinct volcano, which rises from the 1,200-meter plains to reach a height of 4,324 meters. North of Mount Elgon are Kadam (also known as Debasien or Tabasiat) Peak, which reaches a height of 3,054 meters, and Mount Moroto, at 3,085 meters. In the far northeast, Mount Zulia, Mount Morungole, and the Labwor and Dodoth Hills reach heights of over 2,000 meters. The lower Imatong Mountains and Mount Langia, at 3,029 meters, mark the border with Sudan.

Four of east Africa's Great Lakes—Lake Victoria, Lake Kyoga, Lake Albert, and Lake Edward—lie within Uganda or on its borders. Lake Victoria is the second largest inland freshwater lake in the world (after Lake Superior in the U.S.); it feeds the upper waters of the Nile River, which is referred to in this region as the Victoria Nile. Lake Kyoga and the surrounding basin dominate central Uganda. Along the border with the DRC, Lake Albert, Lake Edward, and Lake George occupy troughs in the western Rift Valley. The Victoria Nile leaves Lake Victoria at Owen Falls as it travels toward the northwest and widens to form Lake Kyoga. The Nile receives the Kafu River from the west before flowing north to Lake Albert. From Lake Albert, the Nile is known as the Albert Nile as it travels about 200 kilometers to the Sudan border. The Katonga River flows westward from Lake Victoria to Lake George. Lake George and Lake Edward are connected by the Kazinga Channel. The Semliki River flows into Lake Edward from the north, where it drains parts of the DRC and forms a portion of the Uganda-DRC border.

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. Uganda's biodiversity is one of the highest on the African continent. More than 18,783 species of fauna and flora have been recorded in Uganda.<sup>1</sup> Although Uganda occupies only 2 percent of the world's total surface area (approximately 25,981.57 km<sup>2</sup>), according to the Wildlife Policy 2014 and NEMA (2009), it ranks among the top 10 most biodiverse countries in the world. Seven of the 18 biogeographic regions in Africa are found in Uganda.

## 3.2 MAJOR ECOSYSTEM TYPES

### FOREST BIODIVERSITY

A forest in Uganda is defined as any vegetation type dominated by trees, most of which at maturity are more than 5 meters tall with a tree canopy of at least 30 percent covering an area of at least 1 hectare (NFA, 2008). Forests are estimated to cover 3.3 million hectares, or 16 percent of the total area of the country; forest cover has declined from 4.9 million hectares in 2001 (NEMA, 2015). Of the total area of forests, 36 percent are in Protected Areas (PAs include forest reserves, national parks, and wildlife reserves), whereas 64 percent are found on private and customary land.

The forest structure and composition in Uganda is dependent on altitude, edaphic factors, and history of land use (Obua et al., 2010). According to Langdale-Brown et al., 1964 (**Figure 1**), Uganda's forests are categorized as:

- High Altitude Forest
- Medium Altitude Moist Evergreen Forest

---

<sup>1</sup> NEMA, 2006, Third National Biodiversity Report. National Environment Management Authority, Kampala, Uganda. This statistic is also quoted in the Uganda Wildlife Policy 2014.

- Medium Altitude Moist Semi-Deciduous Forest
- Swamp Forest
- Savanna Forest

The medium altitude moist evergreen forest is the most structurally complex and biodiversity-rich category (Howard, 1991). The medium altitude moist semi-deciduous forests are found in areas where the dry season is longer and more severe. High altitude forest occurs above 1,500 meters and tends to be less species rich than those found at lower altitudes; it has a broken and irregular canopy characterized by trees of low stature (Langdale-Brown et al., 1964).

**Figure 1** shows the last vegetation characterization that was done at national level—the vegetation mapped is from 1964 and is more relevant for its historical information than for current day planning. No updated map has been prepared showing the current categorization of vegetation in Uganda.

Uganda’s Central Forest Reserves (CFR) provide habitat for 1,259 species of trees and shrubs, 1,011 species of birds, 75 species of rodents, 12 species of diurnal primates, and 71 butterfly species (NFA, 2011). CFRs provide habitat for IUCN Red Data Book (2008) species, including four primate species, two other mammals species, six bird species, and two butterflies considered globally threatened with extinction (NFA, 2011), as well as species that are considered “vulnerable” (e.g., chimpanzee, elephant, and leopard).

### **TRENDS IN FOREST BIODIVERSITY**

Uganda is estimated to be losing its forest cover at a rate of 80,000 hectares per year, implying a loss in forest biodiversity as well. Between 1890 and 1990, the area of forest and woodland has declined from 45 percent to 20 percent of total land surface (NFA, 2011 in NEMA, 2015). The majority of forest loss has occurred outside of PAs and is largely due to conversion of forest lands to agriculture and over-harvesting of wood for firewood and charcoal (NFA, 2011, in NEMA, 2015). The rate of decline of forest cover is 1.8 percent per year (NEMA, 2012), equivalent to 2.2 percent in private forests and 0.9 percent in PAs.

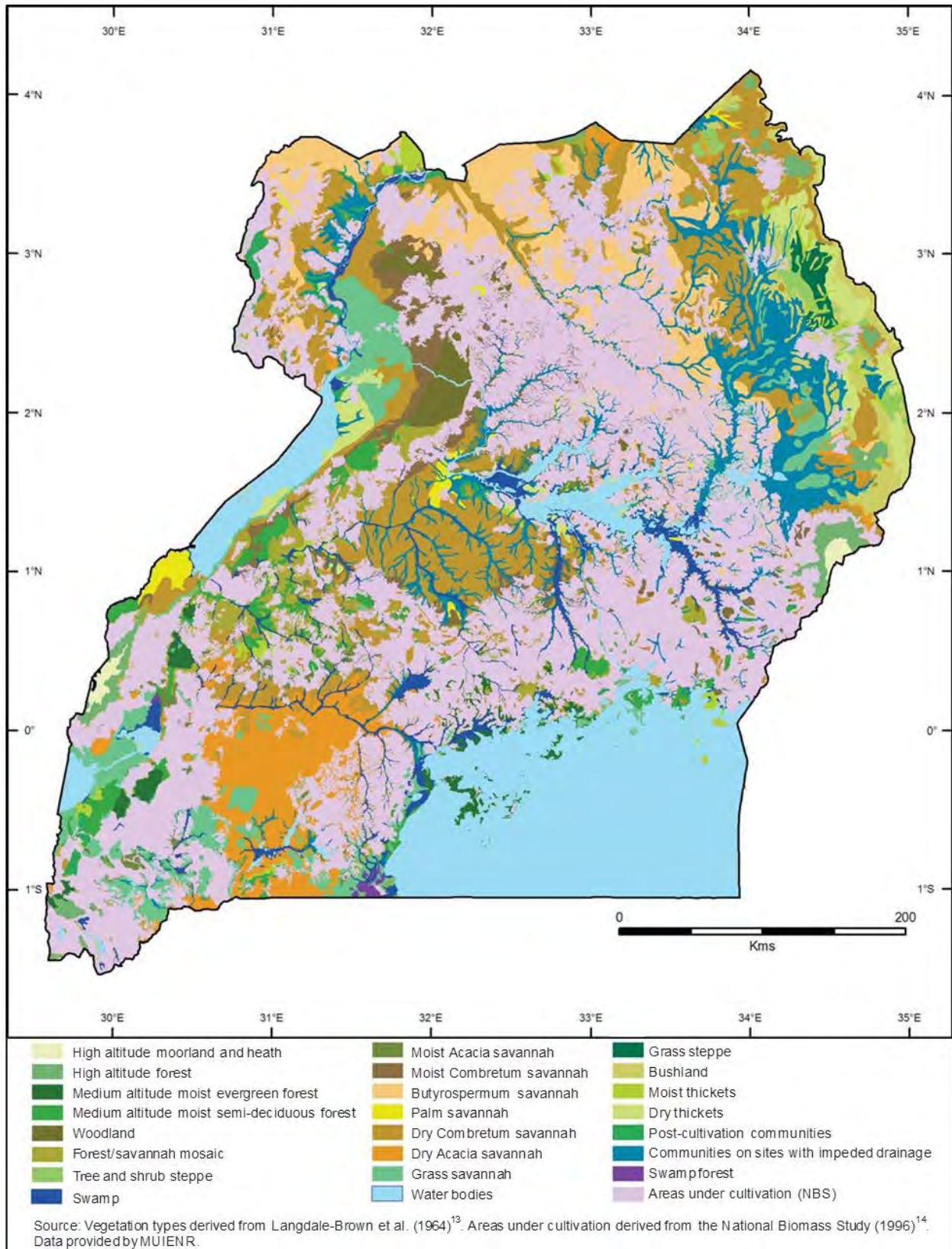
**Table 1** and **Figure 2** show the trend in loss of forest cover (according to the definition of forest above, NFA, 2008) since 1990. At the current rate of forest loss, Uganda could lose all its forest by 2040, resulting in serious economic and ecological consequences.

**Table 1: Trends in Loss of Forest Cover Over Time**

<b>Year</b>	<b>1900</b>	<b>1990</b>	<b>2005</b>	<b>2012 (projected)</b>
Area under forest (million ha)	12.1	4.9	3.6	2.97
Percentage of total land area (%)	50	24.1	17.6	14.5
Forest loss since 1900 (million ha)		7.2	8.5	9.1
Average annual loss (ha)		80,000	88,000	90,000

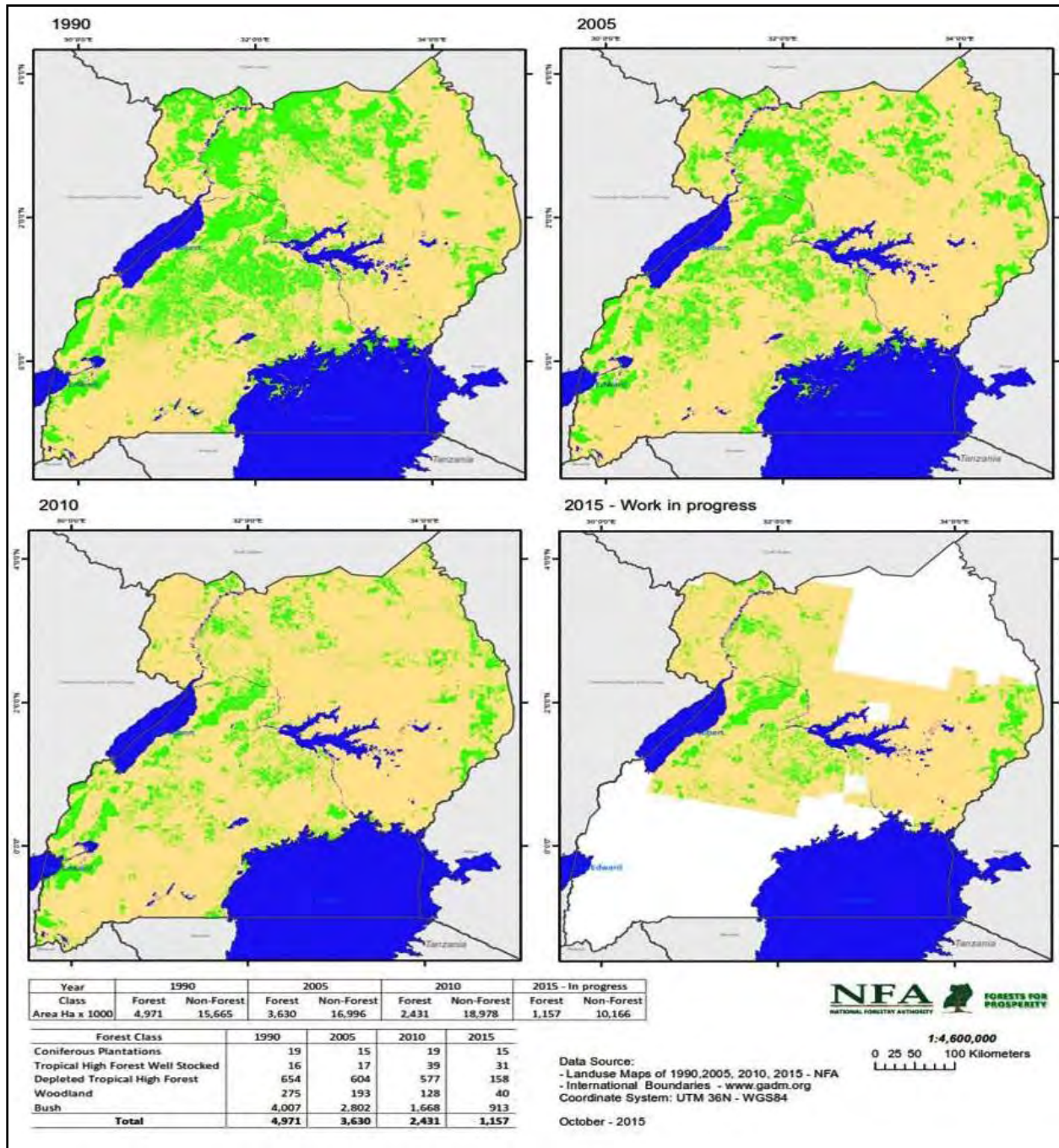


**Figure 1: Map of Uganda's Vegetation Types, 1964**



Source: Cottray et al., 2006, from Langdale-Brown et al., 1964

**Figure 2: Change in Uganda Forest Cover, 1990–2015**



Source: NFA, 2015

## WETLAND/AQUATIC BIODIVERSITY

Approximately 20 percent of the surface area of Uganda is covered by aquatic systems comprising five major lakes (Victoria, Albert, Kyoga, Edward, and George), the Kazinga Channel, about 160 minor lakes, an extensive river system, dams, and ponds (NEMA, 2015). These aquatic systems are usually fringed with extensive wetlands (NEMA, 2012).



The National Policy for the Conservation and Management of Wetland Resources of Uganda (1995) defines the term “wetlands” as areas where plants and animals have become adapted to temporary or permanent flooding by saline, brackish, or fresh water. These include permanently flooded areas with sedge or grass swamp, swamp forest, high altitude mountain bog, seasonal floodplains, and depressions without regular flow.

As a result of the vast surface area and the narrow river-like shape of many of the wetlands, very extensive wetland edge habitat is present in Uganda, providing rich habitat for wildlife, fish, and other species that use wetlands (for nesting and breeding, hunting and feeding, hiding, and/or as a water source). Two broad types of wetland ecosystems are found in Uganda: 1) natural lakes and lacustrine swamps, and 2) riverine and floodplain wetlands associated with the major river systems in Uganda.

Wetlands in Uganda (see **Figure 11** in **Annex F**) provide important habitats for about 43 species of dragonflies, 9 species of molluscs, 52 species of fish (which represent 18 percent of all fish species in Uganda), 48 species of amphibians, 243 species of birds, 14 species of mammals, 19 species of reptiles, and 271 species of macrophytes (NEMA, 2015).

About 600 fish species are found in Uganda; the most commonly encountered is Nile perch (indigenous to Lake Albert and from there, introduced to Lakes Victoria and Kyoga), Nile tilapia (indigenous to Uganda’s lakes), and other small fish species, such as *Rastroneobola argentea*, *Neobola bredoi*, *Clarias gariepinus* (catfish), *Bagrus docmak* (silver catfish), and *Protopterus aethiopicus* (lungfish) (NEMA, 2014).

The contribution to Uganda’s economy from aquatic biodiversity and wetland services is discussed in **Section 4**.

### **TRENDS IN WETLAND/AQUATIC BIODIVERSITY**

According to several of those interviewed for this ETOA, wetlands are the most threatened ecosystem in Uganda. According to Uganda’s wetland mapping exercise of 2008 (the most recent, reliable data), wetlands covered about 37,575.4 km<sup>2</sup> (15.6 percent) of the total surface area of Uganda in 1994 but by 2008 this area had reduced to 26,307.7 km<sup>2</sup> (10.9 percent) (NFA, 2009; MWE, 2012, in NSOER, 2014; the NSOER is the 2012 report but it was finalized in 2014). According to Wetland Department officials consulted for this report, this area has decreased even further due to ongoing encroachment, mainly for agricultural production and infrastructure development (current estimate is about 10 percent).

The NSOER (2014) states that an ongoing, overall decline in wetland coverage is evident in Uganda, with Lake Victoria and Kyoga drainage basins the most affected. This is largely attributed to encroachment for expansion of urban centers and other settlements, industrial developments, and extension of agricultural land (draining of wetlands to enable cultivation and degradation of wetland vegetation from grazing livestock). The number of unplanned settlements has been increasing, and many encroach into wetlands. Declining soil productivity on the uplands is pushing people to farm in lowlands (often wetlands), and this, coupled with complex land ownership issues, is driving encroachment.

Significant pressure is also being exerted on Uganda’s fishery resources. Increasing fishing efforts are exerting high pressure on capture fisheries, leading to a decline in fish stocks and catches prompting use of ever-more destructive fishing gears and technologies and employing extra fishing power to chase fewer fish. This is fueled by the growing population, limited livelihood options, an open access fish management regime, climate change, water pollution, and invasive species (NSOER, 2014).

### **3.3 NATURAL AREAS OF CRITICAL IMPORTANCE**

Natural areas may be considered critically important if they harbor a high number of endemic species or species threatened with extinction, or if they have other globally important biodiversity. Biodiversity “hotspots,” Ramsar Sites (wetlands of international importance), and Important Bird Areas (IBAs) are



described below along with the Albertine Rift, one of the most biodiverse regions on the African continent. See **Section 3.5** for a description of Uganda's PAs, also considered critically important for biodiversity conservation. **Section 3.6** and **Annex G** describe areas outside PA boundaries that harbor critical biodiversity resources.

**Biodiversity hotspots** have a high percentage of endemic species, globally important species, and threatened species (SOER, 2000/2002 in NEMA, 2015). Uganda's biodiversity hotspots are:

- Mgahinga Gorilla National Park and Bwindi Impenetrable National Park due to the presence of mountain gorilla (*Gorilla b. berengei*) and other regionally and globally endemic species
- Rwenzori Mountain National Park, which provides habitat for the bay duiker (*Cephalophu leucogaster*)
- Sango bay wetlands and forest ecosystem, which harbor biodiversity of global significance, such as *Chlidonias leucopterus* (white-winged tern), *Ardeola ralloides* (scuacco heron), *Hirundo atrocaerulea* (blue swallow), *Loxodonta africana* (African bush elephant), and *Colobus guereza adolfi-friederici* (eastern black and white colobus)
- Kibale National Park due to primate species richness and because it provides habitat for globally and regionally endemic species, such as *Ptilopachus nabani* (Nathan's partridge), *Columba albinucha* (white-naped pigeon), and *Laniarius mufumbiri* (papyrus gonolek)
- Dry mountains of Karamoja (Napa, Morungole, Kadam, Timu, and Moroto) because of the regional and global endemics found there, such as *Apalis karamojae* (a globally threatened warbler)
- Lake Victoria due to rich populations of cichlids
- Papyrus swamps of Lake Edward, George, and Bunyonyi, which have, among other endemics, endemic papyrus (*bioropetagracilirosiris*)

Thirty-four **Important Bird Areas** (NEMA, 2014a), composed of wetlands, uplands, and a mixture of the two, have been designated (**Figure 3**) in Uganda. IBAs provide habitat for globally endangered species of birds, such as the shoebill stork (*Balaeniceps rex*) and Fox's weaver (*Ploceus spekeoides*) (NEMA, 2014a). As shown in **Figure 3**, several IBAs are PAs, and therefore, are considered protected by the Government of Uganda. Others, such as Doho and Kibimba Rice Schemes and other IBAs outside the boundaries of PAs, have no formal protection.

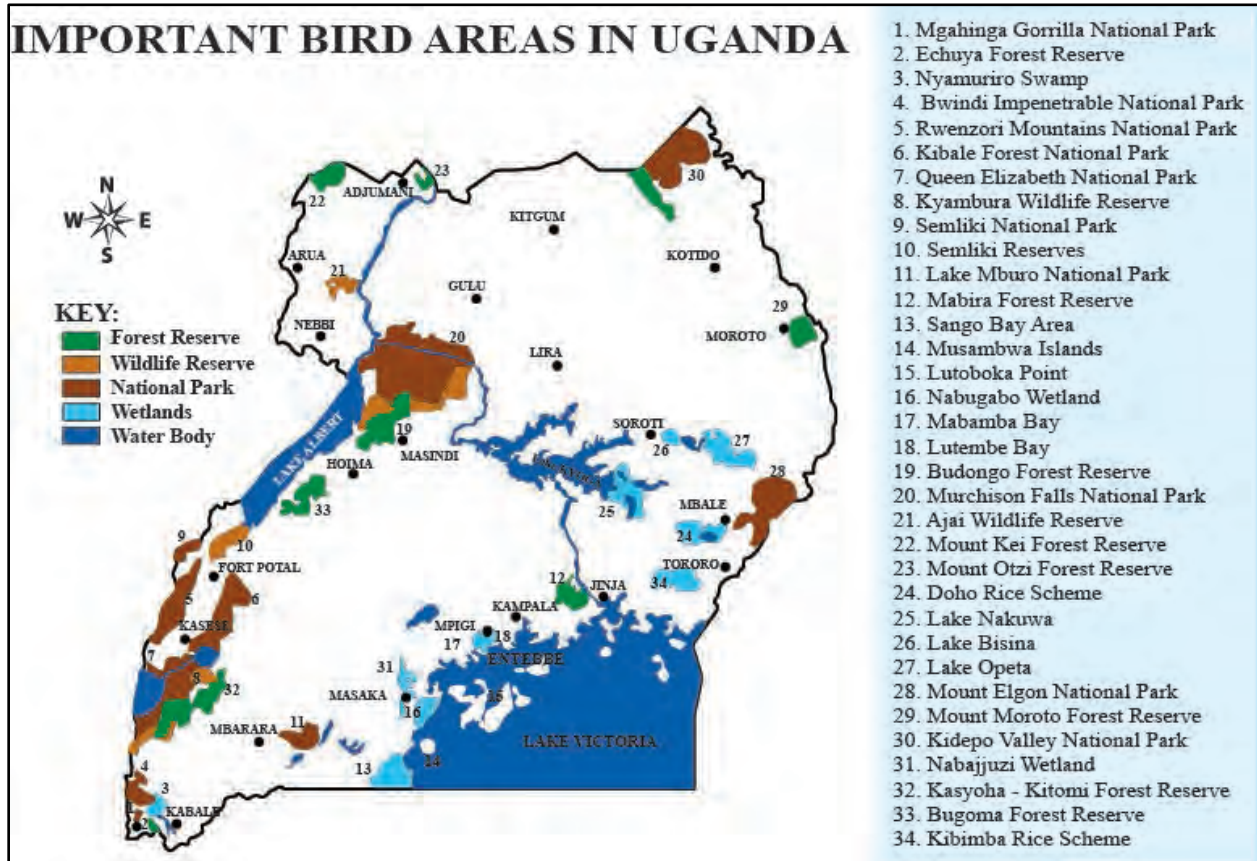
Wetlands are considered among the most diverse and productive ecosystems, as well as the most threatened (as mentioned above). The Convention on Wetlands of International Importance (the Ramsar Convention), an intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources, uses a broad definition that considers wetlands to be all lakes and rivers, underground aquifers, swamps and marshes, wet grasslands, peatlands, oases, estuaries, deltas and tidal flats, mangroves and other coastal areas, coral reefs, and all human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans.

Twelve **Ramsar Sites** have been designated in Uganda (**Table 2**). Unless protected by national government, Ramsar Sites have no formal protection. See **Section 3.5** for information on Uganda's efforts to protect wetlands.

According to <http://albertinerift.org/>, the **Albertine Rift** or Africa's Western Rift Valley contains more than half of Africa's birds, 40 percent of Africa's mammals, and about 20 percent of its amphibians and plants. It contains more vertebrate species than anywhere else on the continent. It also provides habitat for more threatened and endemic species than any other region of Africa. The Albertine Rift ecosystems face significant threats. Human population density in the Albertine Rift is high with more than 1,000 people per square kilometer in some areas of the Rift, with some of the poorest people on the continent. It has been a region of great conflict over the past 40 years with civil wars in Uganda, Rwanda, Burundi, and the DRC. In Uganda (see figures in **Annex G** of the Albertine Rift area in Uganda), threats related to high human

population and poverty are exacerbated by ongoing and proposed mining, oil and gas exploration and production, and other infrastructure development (see Section 6).

**Figure 3: Important Bird Areas (IBAs) in Uganda, 2010**



Source: Nature Uganda, in NEMA 2014, Fifth Report on Biodiversity to CBD

**Table 2: Wetlands in Uganda Recognized as Important Under the Ramsar Convention**

No.	Wetland name	Area in km <sup>2</sup>	Date of designation
1	Lake Bisina Wetland System	542.29	Sept. 15, 2006
2	Lake Nakuwa Wetland System	911.5	Sept. 15, 2006
3	Lake Opeta Wetland System	689.12	Sept. 15, 2006
4	Lake Mburo-Nakivali Wetland System	268.34	Sept. 15, 2006
5	Lake Nabugabo Wetland System	220	Feb. 11, 2004
6	Murchison Falls-Albert Delta Wetland System	172.93	Sept. 15, 2006
7	Lake George	150	March 4, 1988
8	Sango Bay-Musambwa Island-Kagera Wetland System (SAMUKA)	55.11	Sept. 15, 2006
9	Rwenzori Mountains Ramsar Site	995.0	May 13, 2009
10	Mabamba Bay Wetland System	24.24	Sept. 15, 2006
11	Nabajjuzi Wetland System	17.53	Sept. 15, 2006
12	Lutembe Bay Wetland System	0.98	Sept. 15, 2006

Source: Ramsar, C.O.P. (2015). The List of Wetlands of International Importance

### 3.4 SPECIES

Uganda has approximately 5,000 species of higher plants, mainly concentrated in forests in the western region (NEMA, 2015). The lower plants are generally poorly documented in Uganda. They fall under three main types: algae (115 species), *pteridophytes* (ferns) (386 species), and *bryophytes* (mosses). *Bryophytes* (500 species), liverworts (250 species), and hornworts represent the most ancient lineage of land plants (UNESCO, 2012, in NEMA, 2015).

Uganda's State of the Environment Report (NSOER, 2014) states that Uganda hosts 53.9 percent (400 individuals) of the world's remaining population of mountain gorillas, 11 percent (1,057 species) of the world's recorded species of birds (50 percent of Africa's bird species; 10 percent of the world total), 7.8 percent (345 species) of the global mammal diversity (39 percent of Africa's mammals; Uganda is second only to the DRC in the number of mammal species in Africa), 1,249 recorded species of butterflies, and 600 species of fish.

According to NEMA (2015), 98 species of amphibians have been recorded in Uganda, representing 1.65 percent of global species. Most of the amphibian species in Uganda have an IUCN category of Least Concern because they either have a wide distribution, are tolerant to a broad range of habitats, or are presumed to have large populations. Approximately 150 reptile species (approximately 1.5 percent of total global species) are found in Uganda. Very little is currently known or documented about these taxa (NBI, 2010, in NEMA, 2015). About 8,999 species of insects (1.2 percent of the number of global species) in 3,170 genera are found in Uganda (NBI, 2010, in NEMA, 2015).

**Table 3** summarizes the population trends of some of Uganda's medium and large grazing animals from the 1960s through 2011. The 2011 ETOA provided these data only through 2004–2006. The table shows that in general, most populations are increasing or remain stable. The latest data (2011–2014) are from the final draft of the State of the Uganda's Wildlife Resources, which is based on UWA wildlife surveys.

**Table 3: Trends in Large Mammal Populations in Uganda**

Years / Species	1960s	1982–1983	1995–1996	1999–2003	2004–2006	2007–2010	2011	2011–2014	Status in Uganda
Buffalo	60,000	25,000	18,000	17,800	30,306	21,565	21,639	36,953	Population increasing (based on #s from the 1980s and '90s)
Burchell's zebra	10,000	5,500	3,200	2,800	6,062	11,814	n/a	11,888	Population stable
Elephant	30,000	2,000	1,900	2,400	4,322	4,393	n/a	5,346	Population stable
Rothschild's giraffe	2,500	350	250	240	259	984	n/a	880	Population stable
Hartbeest	25,000	18,000	2,600	3,400	4,439	4,099	4,001	9,667	Population stable
Hippo	26,000	13,000	4,500	5,300	7,542	6,580	n/a	5,838	Population stable
Impala	12,000	19,000	6,000	3,000	4,705	33,565	n/a	29,285	Population slightly declined <sup>2</sup>
Topi	15,000	6,000	600	450	1,669	845	n/a	2,222	Population stable
Uganda kob	70,000	40,000	30,000	44,000	34,461	54,861	54,080	77,759	Population stable
Waterbuck	10,000	8,000	3,500	6,000	6,493	12,925	13,128	12,222	Population increasing
Common eland	4,500	1,500	500	450	309	1,409	n/a	1,351	Population stable

<sup>2</sup> According to UWA, the discrepancy in figures between 2006-2007 is due to different methods of surveying. Aerial surveys had been used in LMNP, but with the increase of acacia trees, aerial surveys were no longer feasible, and UWA used ground counts.

Years / Species	1960s	1982–1983	1995–1996	1999–2003	2004–2006	2007–2010	2011	2011–2014	Status in Uganda
Bright's gazelle	1,800	1,400	100	50	n/a	n/a	57	Data n/a	Population precarious but recovering
Roan	700	300	15	7	n/a	5	20	Data n/a	Population precarious but recovering
Oryx	2,000	200	0	0	0	0	0	0	Extinct in Uganda
Black rhino	400	150	0	0	0	0	0	0	Extinct in Uganda
Derby's eland	300	0	0	0	0	0	0	0	Extinct in Uganda
Northern white rhino	300	20	0	0	0	0	0	0	Extinct in Uganda
Eastern black rhino	400	150	0	0	0	0	0	0	Extinct in Uganda
Southern white rhino					6	11	14	17	A breeding population at the Rhino Sanctuary increasing
Lion				600		416		No new data	Population declining fairly rapidly

Source: UWA, 2015

## ENDEMIC, THREATENED, AND ENDANGERED SPECIES

Uganda's endemic species are primarily associated with high mountains, forests and the major Pleistocene refugia of the Albertine Rift Valley (NEMA, 2012). Approximately 70 species of higher plants are endemic (NEMA, 2015). About 70 species of endemic butterflies are found in Uganda (Eilu et al., 2008). Uganda's endemic mammals are the *Dasymys montanus* (Montane shaggy rat) and *Pelomys isseli* (Sese Islands creek rat). Lakes Victoria, Kyoga, and George are of international importance in conservation of endemic wetland species, with a very high concentration of endemic cichlid fish species (NBI, 2010, in NSOER, 2014). In Uganda, 324 species of cichlids are found, of which 292 are endemic to Lake Victoria. In addition, 42 non-cichlid species are found throughout Uganda's aquatic systems. Of these, 15 are endemic to Lake Victoria (NSOER, 2014).

**Annex L** contains a list of threatened and endangered species in Uganda. The lists are working documents, showing conservation status in Uganda and recommended conservation measures. The lists use IUCN Red List data and Uganda-specific information on mammals, reptiles, plants, and birds. Wildlife Conservation Society is compiling data and preparing a list of species threatened with extinction in Uganda; the list will be reviewed by the Government of Uganda (GOU) and, once accepted, IUCN will update the Red List data. **Table 4** shows the number of globally threatened species in Uganda. **Table 5** shows the change, from 2004 to 2008, in the number of species considered to be threatened with extinction or extinct. The data in **Table 5** are from 2008; this is the most up-to-date information currently available.

The 2011 ETOA provided data from 2007; at that time: 34 animals had gone extinct; 4 animals had gone extinct in the wild; 27 animals and 3 plants were critically endangered; 31 animals and 4 plants were endangered; and 72 animals and 33 plants were vulnerable.

African white-backed vulture (*Gyps africanus*), Shoebill stork (*Balaeniceps rex*), and African black duck (*Anas sparsa*) are some examples of endangered bird species at the national level. Great crested grebe (*Podiceps cristatus*) and black-crowned crane (*Balearica pavonina*) are critically endangered (WCS, 2015).

**Table 4: Recorded Flora and Fauna Species in Uganda & Conservation Status (as of 2015)**

Taxon	Total number of species	Percent of global species	No. of globally threatened species	Percent of total species that are threatened
Amphibians	86	1.7	10	11.6
Birds	1,012	10.2	15	1.5
Butterflies	1,242	6.8	-	-
Dragonflies	249	4.6	-	-
Ferns	389	3.2	-	-
Fish	501	2.0	49	9.8
Flowering plants	4,500	1.1	40	0.9
Fungi (polypore)	173	16	-	-
Liverworts	275	46	-	-
Mammals	345	7.5	25	7.3
Molluscs	257	0.6	10	3.9
Mosses	445	3.5	-	-
Reptiles	142	1.9	1	0.7
Termites	93	3.4	-	-
Other invertebrates	-	-	17	-

Source: NEMA, 2015

**Table 5: Conservation Status of Some Plants and Animals by 2008**

Conservation status	No. of species	
	2004	2008
Extinct	34	34
Extinct in the wild	4	4
Critically endangered	27	28
Endangered	31	36
Vulnerable	72	67
Lower risk/conservation dependent	18	18
Threatened	54	51
Near threatened	64	66
Data deficient	41	36
Least concern	1,562	1,508

Source: IUCN Red Lists, 2004 and 2008

At the global level, Uganda has 11 endangered mammals, 1 critically endangered, 16 near-threatened, and 18 vulnerable species. At the national level, 14 mammal species are critically endangered, 25 are endangered, 38 vulnerable, 12 near-threatened, and 2 regionally extinct species (WCS, 2015). Black rhino (*Diceros bicornis*) is regionally extinct. The lion (*Panthera leo*), cheetah (*Acinonyx jubatus*), hunting dog (*Lycan pictus*), and hyena (*Hyaena hyaena*) are critically endangered in Uganda. Some of the vulnerable species include dwarf forest shrew (*Sylvisorex vulcanorum*), tree pangolin (*Phataginus tricuspis*), and ground pangolin (*Smutsia temminckii*). Lhoest's monkey (*Cercopithecus lhoesti*) is near-threatened and Uganda bay colobus (*Procolobus tephrosceles*) and mountain gorilla (*Gorilla b. berengei*) are endangered. African elephant (*Loxodonta Africana*) is critically threatened (WCS, 2015).

Of the 98 species of amphibians found in Uganda, three species are recorded as restricted; five species vulnerable; one species is near threatened; one species critically endangered; one species (northern clawed frog) is extinct; and three species are data deficient (NBI, 2010, in NEMA, 2015).



Some of the vulnerable plants are shea tree (*Vitellaria paradoxa*), African blackwood (*Dalbergia melanoxylon*), and red stinkwood (*Prunus africana*). African mahogany (*Khaya anthotheca*), Senegal mahogany (*Khaya grandifoliola*), drum tree (*Cordia millenii*), and Afzelia (*Afzelia africana*) are categorized as endangered plant species in Uganda (WCS, 2015).

### 3.5 STATUS AND MANAGEMENT OF PROTECTED AREAS

Protected areas (PAs) gazetted by law in Uganda include Wildlife Protected Areas (WPAs), Wildlife Management Areas (WMAs), and Forest Reserves (FRs). Wetland Reserves are managed for sustainable use.

#### WILDLIFE PROTECTED AREAS AND WILDLIFE MANAGEMENT AREAS (WMA)

The new Wildlife Policy 2014 and Wildlife Act 2000 provide for two categories of wildlife conservation areas (WPAs and WMAs) where wildlife is protected, managed, or sustainably utilized (see **Figure 4**):

- Wildlife Protected Areas: National Parks and Wildlife Reserves
- Wildlife Management Areas: Wildlife Sanctuaries, Community Wildlife Areas, and any other area decreed by law for sustainable management of wildlife.

Wildlife conservation areas are managed by the Uganda Wildlife Authority (UWA), which was established in 1996 as a merger of the Game Department and Uganda National Parks.

Uganda has 10 National Parks and 12 Wildlife Reserves; the numbers have remained unchanged since the 2011 ETOA. A National Park and Wildlife Reserve, as defined under the Wildlife Act, is an area of national and international importance because of its biological diversity, landscape, or national heritage. The main purposes for establishment of wildlife PAs under the Wildlife Act (2000) are:

- 1) To preserve selected examples of biotic communities of Uganda and their physical environments (for biodiversity conservation);
- 2) To protect areas of aesthetic beauty and of special interest (for recreation and scenic viewing);
- 3) To preserve populations of rare, endemic, and endangered species of wild plants and animals (as well as scientific research);
- 4) To assist in water catchment conservation; and
- 5) To generate economic benefits from wildlife conservation for the people of Uganda (extractive utilization and other economic activities).

**Table 12** in **Annex F** provides details of the number of staff, the status of management plans, and other information on Uganda's wildlife PAs.

WMAs are areas gazetted for sustainable management of wildlife on community, private, or public land. The guiding principle for WMAs is protection and sustainable management of wildlife populations outside of PAs in collaboration with local communities, district local governments (DLGs), and other stakeholders, such as the forestry and wetlands management institutions. Uganda has two categories of WMA listed in **Annex F, Table 12**:

- Wildlife Sanctuaries: Wildlife species are protected and human activities that are detrimental to the existence of wildlife populations are prohibited or regulated. Examples of wildlife sanctuaries include Entebbe and Jinja Bird Sanctuaries; and animal sanctuaries in fishing villages in QENP. Uganda has a total of 10 wildlife sanctuaries.
- Community Wildlife Areas: The five Community Wildlife Areas (CWAs), the same number at the time the last ETOA was prepared, are mainly wildlife migratory and dispersal corridors gazetted on private,

public, or communal land to facilitate development of wildlife management programs for the benefit of local communities and to mitigate losses caused by wildlife. Management of wildlife resources in these areas is through UWA permits for direct utilization, tourism, and conservation enterprises. Permits are based on licensing or collaborative management agreements with UWA, the land owners, private sector, district local government, and other stakeholders.

The Wildlife Act (2000) and the National Forestry and Tree Planting (NFTP) Act (2003) provide for collaborative forest management (CFM) to take place wholly or in part of a national park, wildlife reserve, and FR. The law further allows for creation of local and private wildlife reserves by local governments or private land owners. However, none have been declared to date.

## **FOREST RESERVES**

FRs, established under the NFTP Act (2003), are areas protected for ecological, forestry, and tourism purposes, and for enhancement of a clean and healthy environment for the common good of the citizens of Uganda. Section 4 of the Act classifies FRs into the following categories:

- Central Forest Reserves (CFR)
- Local Forest Reserves (LFR)
- Community forests (CF)
- Private forests
- Forests forming part of a wildlife conservation area declared under the Uganda Wildlife Act 2000, Cap 200

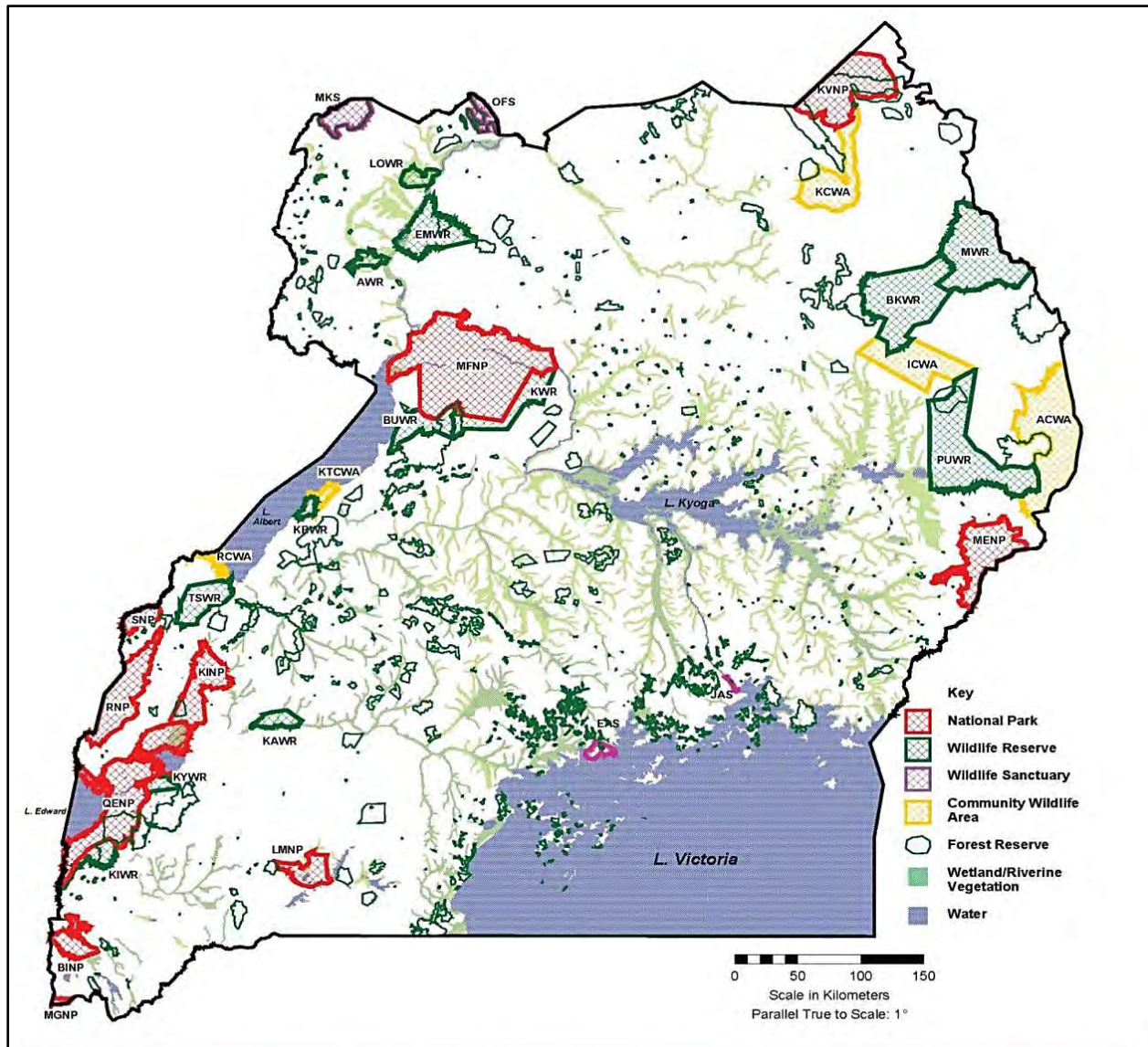
The NFTP Act (2003) defines CFRs and LFRs as:

- “(a) a site of special scientific interest for the purpose of
- i) protecting nature and scenic areas of national or international importance
  - ii) enhancing biological genetic resources in an undisturbed, dynamic and evolutionary state
  - iii) maintaining animal and plant indicator species; or
  - iv) preserving rare, endangered or vulnerable species, or high biological diversity;
- (b) a strict nature reserve for the purpose of
- i) protecting streams, rivers, lakes, lakeshores, riverbanks or wetlands;
  - ii) soil, slope and environment protection; or
  - iii) protecting the ecosystem;
- (c) a joint management forest reserve
- (d) recreation forest for purposes of eco-tourism; or
- (e) any other area, for a purpose prescribed in the order.”

FRs may be managed under three authorities: the Uganda National Forestry Authority (NFA) charged with management of CFRs; the District Forestry Services (DFS) in charge of LFRs with oversight of community forests; and dual management by NFA and UWA of FRs that overlap with WPAs, for example South Maramagambo Forest in Queen Elizabeth Conservation Area (QECA) and part of Budongo Forest Reserve in Karuma Wildlife Reserve (part of Murchison Falls Conservation Area (MFCA).

Before 1967, when the GOU abolished the independence federal constitution, most FRs were managed by district officials through decentralized mechanisms. In 1967, the GOU adopted a republican constitution, which centralized virtually all government decision making, and all FRs were then managed by the central government under the Forest Department. Since then, forest management has undergone a number of reforms.

Figure 4: Wildlife Protected Areas in Uganda



National Parks (10)		Wildlife Reserves (12)		Community Wildlife Areas (5)		Wildlife Sanctuaries (10)	
1. BINP	Bwindi Impenetrable	1. AWR	Ajais	1. ACWA	Amudat	1. EAS	Entebbe
2. KINP	Kibale	2. BKWR	Bokora Corridor	2. ICWA	Iriiri	2. JAS	Jinja
3. KVNP	Kidepo Valley	3. BUWR	Bugungu	3. KCWA	Karenga	3. MKS	Mt. Kei
4. LMNP	Lake Mburo	4. EMWR	East Madi	4. KTCWA	Kaiso-Tonya	4. OFS	Otze Forest
5. MENP	Mount. Elgon	5. KAWR	Katonga	5. RCWA	Rwengara	<b>Sanctuaries In QENP/Kyambura</b>	
6. MFNP	Murchison Falls	6. KBWR	Kabwoya			5. KHAS	Kahendero
7. QENP	Queen Elizabeth	7. KWR	Karuma			6. KSAS	Kashaka
8. RNP	Rwenzori Mountains	8. KIWR	Kigezi			7. KYAS	Kayanja
9. SNP	Semliki	9. KYWR	Kyambura			8. KZAS	Kazinga
10. MGNP	Mgahinga Gorilla	10. MWR	Matheniko			9. KIAS	Kisenyi
		11. PUWR	Pian-Upe Toro –Semliki			10. RWAS	Rwenshama
		12. TSWR					

Source: The National Wildlife Policy, 2014



In 1993, the GOU adopted the decentralization policy, and under the Local Government Statute of 1993, FRs were once again decentralized. However, local governments had limited capacity to effectively manage FRs; as a result, in 1995 under Statutory instrument No. 52, forests were recentralized. But soon after, the Local Government Act 1997 was enacted, which specified under the Second Schedule, Part 2, that forests were a function of local governments. This once again effectively decentralized management of forests. For central government to regain control of FRs and also maintain local governments' role in forest management, the GOU gazetted Statutory Instrument No. 63 of 1998, which created CFRs and LFRs (Nsita, 2010). In total, 192 LFRs (5,000 ha) and 542 CFRs (1,455,130 ha) were created. The NFTP Act 2003 maintained the status quo but distinguished the respective responsible bodies for the two categories. In addition to CFRs and LFRs, the NFTP Act 2003 provided for declaration of community forests and recognized forests on private land, which need to be sustainably managed for the benefit of the land owners and the ecosystem services they provide. **Figure 10 in Annex F** shows the location of Uganda's CFRs and LFRs.

## **LOCAL FOREST RESERVES**

Many of the LFRs (managed by DFSs) have been heavily encroached and severely degraded, and in some cases they have been degazetted and local governments have allocated them for infrastructure development. LFRs are seen as a source of revenue generation for the poorly resourced local governments, and therefore, may be subject to poorly or uncontrolled timber harvesting and charcoal burning. The 2010 Government of Uganda Audit report indicated that some districts have authorized harvesting of LFRs without clarifying the exact areas to be harvested; sometimes harvesters—knowingly or unknowingly—have encroached on CFRs. This is attributed to lack of management plans to guide harvesting and other activities; the underlying causes are weak governance and lack of political will to conserve forests. The ETOA Team was unable to identify an existing Management Plan for any LFR; it is highly unlikely that one exists.

The lack of management planning for LFRs by the districts is primarily due to limited resources. The GOU Audit Report (2010) indicates that the mandate of the districts in regard to LFRs is not being adequately undertaken. The majority of districts have not set up DFSs to manage LFRs. Where they have been established, they lack staff and are grossly underfunded in terms of operating funds, equipment, and transport. As such, the District Forestry Officers are unable to collect the forestry revenues that local governments should plough back into management of district FRs. Another reason cited for limited investment in forest management by the districts is the continued poor appreciation of the long-term environmental importance of forests among some local governments (Nsita, 2010). Indirectly, these issues can be attributed to limited political will; politicians fail to provide the funding needed for districts to adequately manage forest resources.

Section 12 of the NFTP Act (2003) provides for transfer of an LFR to the NFA if a local government has failed to manage, maintain, and control an FR as required by law, and it is deemed necessary for the proper protection, control, and management of a local forest. To date, no LFR has been transferred to NFA. Instead, local governments are exerting pressure on NFA to degazette or transfer forests from NFA to DFSs, especially urban CFRs, which are seen as prime areas for industrial development and urban expansion. Examples of this include the Nebbi Urban FR, which was allocated by the District Land Board for town expansion, and Namanve FR, which was degazetted for an industrial park (Auditor General, 2010). In both cases, no alternative land of equal measure was allocated for the establishment of new forests to balance development initiatives and the environment as required by the NFTP Act 2003. Other examples include Mbarara CFR, where 168 ha were degazetted in 2007 for urban expansion and Fort Portal CFR, allocated to a private developer (The Observer, March 25, 2014)<sup>3</sup>. These transfers are significant threats to forest biodiversity (see **Section 6.1.3**).

Section 16 of the NFTP Act (2003) provides for reclassification of CFRs to LFRs. A local community, a local council, or an interested person may at any time write to the responsible minister requesting review of the

---

<sup>3</sup> <http://www.observer.ug/component/content/article?id=30888:forest-land-giveaways-weighing-in-on-uganda>

status of a CFR to be reclassified to an LFR and vice versa. The Act does not define the circumstances or reasons for which an applicant may seek reclassification of a CFR to an LFR.

## COMMUNITY FORESTS

No CFs have been declared to date (2015); however, some forests on private and public land in Masindi District are in the process of being registered by the DLG to be gazetted as private forests and CFs, respectively. An area to be declared a CF is identified through consultations with the local community and District Land Board, and upon approval by a resolution of the district council, by statutory order, the responsible minister may declare the area a CF. The declaration specifies the body responsible for management of the CF, which could be the local community, a private sector partnership, or any other body as specified in the declaration.

## WETLAND RESERVES

Protected wetlands are gazetted as **Wetland Reserves**. The Wetland Policy (1995) provides for protection and sustainable use of wetlands. The GOU requires the protection of vital<sup>4</sup> and critical<sup>5</sup> wetlands, and that their characteristics and functions be conserved through boundary demarcation and restoration<sup>6</sup> (this is part of the process to gazette them as Wetland Reserves). Uganda has designated the 12 Ramsar Sites as vital and critical wetlands.

The Wetlands Department in the Ministry of Water and Environment (MWE) has jurisdiction for wetlands management. MWE is now assessing additional wetlands to be listed as wetlands of vital and critical importance, especially those near urban areas:

- Gazettement of three vital and critical wetlands, including Nakivubo and Kinawataka wetlands in Kampala, as Wetlands Reserves is currently taking place (Wetlands Department, 2014).
- Boundary demarcations of five critical municipal wetlands (Jinja, Mbale, Gulu, Lira, and Bushenyi) have been completed and the wetlands are awaiting gazettement (Ministerial Policy Statement, 2013/2014).

Gazettement of these wetlands as PAs is delayed because the Wetlands Bill is currently under discussion and has yet to be enacted into law. The gazettement process involves consultation with all stakeholders at local, district, and central government levels, followed by approval of gazettement notices by DLG, which are then presented by the MWE to Parliament. The delay in enacting the Wetlands Bill has been cited as one of the challenges in wetlands management (MWE, 2015). During the delay period, wetlands continue to be at risk, and given that communities are aware of the plans to gazette, are more likely to be encroached, drained, and their resources unsustainably harvested (pers. comms., October 2015).

## MAJOR THREATS AND CHALLENGES FACING PROTECTED AREAS

A number of direct threats and challenges face PAs, mainly related to human activities. Based on the Team's discussions and analysis, the major threats to PAs in order of priority are:

- 1) Agricultural expansion into natural ecosystems especially forests and wetlands;

---

<sup>4</sup> A **vital** wetland is considered to provide at least one known essential good, service, or other attribute, for which there is either no alternative source of supply, or where the alternative is not practically or economically viable. This includes wetlands that contribute crucially to services provided by a larger wetlands system or wider ecosystem); or harbor an endangered, endemic, or rare species; or contain unique habitats. (Source: Wetland Department, 2014)

<sup>5</sup> A **critical** wetland is one that is subject to on-going degradation that may jeopardize continuation of its attributes to supply ecosystem goods and services or its existence. (Source: Wetland Department, 2014)

<sup>6</sup> **Restoration** refers to re-establishment of wetland conditions to as near as possible the original conditions in an area where the wetland state had been altered by past human activities. The Wetland Department undertakes this activity by removal of illegal structures and alien species, removal of reticulation of water to allow for natural regeneration and sometimes replanting of wetland vegetation. The before and after conditions of the wetland are noted and the restoration is measured in terms of number of hectares restored. (Source: MWE, 2015)

- 2) Charcoal production and firewood harvesting for both commercial and subsistence use;
- 3) Extractive industries and infrastructure development, such as oil and gas production, mining, hydropower development, geothermal power production, and urban/peri-urban expansion;
- 4) Illegal activities such as poaching, illegal pit sawing, and trafficking of wildlife and wildlife products;
- 5) Human-wildlife conflicts; and
- 6) Invasive species (both aliens and local).

These threats are described in detail in **Section 6**.

### **3.6 STATUS OF KEY NATURAL RESOURCES OUTSIDE PROTECTED AREAS**

The bulk of Uganda's forests (64 percent) are located on private land (NFA, 2011) outside PAs. Left in their natural states, these forests would harbor the same level of biodiversity as forests within PAs. As mentioned above, the rate of decline of forest cover is 1.8 percent per year (NEMA, 2012), equivalent to 2.2 percent in private forests and 0.9 percent in PAs; forest outside PAs is experiencing greater pressure and degradation than protected forests.

Some restricted range plant species occur outside PAs. For example, *Aloe tororoana* is only found on Tororo rock, an area of only a few hectares. *Phoenix reclinata* (wild date palm) is highly vulnerable outside PAs, as it is harvested to use as poles for fencing especially in urban areas. However, according to National Biodiversity Strategy and Action Plan (NEMA, 2015), the status of plants and wildlife outside PAs is largely unknown.

According to African Wildlife Foundation (AWF, 2014), most wildlife in many parts of Uganda spend more time outside PAs, which were traditionally dispersal areas and wildlife corridors (see **Annex G**). However, historic wildlife migration corridors have been encroached and migrations of large mammals have been interrupted. Most large mammals in Uganda range beyond PA boundaries and are at risk of being trapped, poisoned, and hunted. Chimpanzees and other primate species use riverine forests, often outside PAs, as resting and hunting grounds. However, forest habitat outside PAs is fragmented due to harvesting for fuel wood and for poles and other infrastructure uses, and this is affecting chimpanzee populations and behaviors (pers. comms., October 2015).

Lake Mburo National Park (LMNP), covering 370 km<sup>2</sup>, is an anchor for wildlife in the ecosystem (AWF, 2014). But the park is too small to provide adequate habitat, and, therefore, wildlife spends considerable time outside the PA. According to AWF (2014), in 2009 UWA conducted a large mammal census that showed significant wildlife numbers frequently disperse to areas outside the park. However, habitat in dispersal areas around the park has become fragmented as communities expand agriculture and increase their cattle stock. Incidences of human-wildlife conflict have increased eroding relationships between the neighboring communities and the park (AWF, 2014). As described in **Section 7.1**, conservancies and collaborative forest management are potential solutions to some of the pressures on wildlife and plants found outside PAs.

According to the National Biodiversity Strategy and Action Plan (NEMA, 2015), Uganda's present policies and legislation for management of terrestrial biodiversity outside PAs is inadequate. The National Biodiversity Strategy and Action Plan (NBSAP) states that "existing tenure systems of land holdings, leaseholdings, and customary holdings offer little incentive for protection and management of biodiversity outside protected areas, where habitat and species are at the mercy of individual land owners."

Aquatic biodiversity is, to a large extent, outside the PA system. In Uganda, most wetlands occur outside PAs. Uganda's aquatic biodiversity consists of lakes (46,900 km<sup>2</sup>), swamps (7,300 km<sup>2</sup>), and rivers (2,000 km<sup>2</sup>), as well as wetlands, and the plant and animal life that relies on this habitat. According to NEMA (2015), aquatic biodiversity suffers direct human impacts as communities exploit it for their sustenance. For example, fish biodiversity has been adversely affected due to unregulated exploitation without adequate provisions for

sustained renewal of the fish. Shoreline vegetation, such as papyrus (*Vossia* and *Typha*, which are under increasing threat), form important habitat for fish biodiversity.

Grasslands/savannas cover more than 50 percent of the land area of Uganda and are dominated by species of grasses, palms, and acacias. A diversity of other plant and animal species is also closely associated with natural savanna types. Much of Uganda's savanna habitat has been converted to human use for agriculture and grazing. The remaining pockets of natural savannas and grasslands are primarily found in PAs.

Little is known about the status of soil biodiversity because it has received less attention from researchers and planners (Rwakaikara, 2008 in NEMA, 2015). Ninety-two species of soil bacteria, 420 of fungi, and 115 of algae are found in Uganda (NEMA, 2002). As far as biodiversity conservation is concerned, the most important of these is the soil bacteria (Okwakol, 2007, in NEMA, 2015). Below ground biodiversity is declining due to land use changes, decreased organic resources, disturbed habitat, and use of minerals and pesticides in intensively managed systems in Uganda. Yet below ground biodiversity is important for sustaining the productivity of soils (Rwakaikara et al., 2010).

Agricultural biodiversity is defined as the diversity of useful plants in managed ecosystems such as agricultural land. It includes biological resources that are tied to agriculture, for instance genetic resources used in breeding crop varieties and animal breeds, edible plants and crops, livestock, soil organisms necessary for soil fertility, and insects for pollination of crops (Thrupp, 2000).

Plant genetic resources (PGR) in Uganda range from little-known indigenous wild fruits and vegetables, pastures and forages, medicinal plants, indigenous staples (millet and sorghum) to introduced crops such as maize, tobacco, coffee, cotton, and beans.

Uganda's NBSAP (NEMA, 2015) recognizes the abundant agricultural biodiversity in Uganda. However, no studies have documented agricultural biodiversity at the national level (NEMA, 2015). The few available site-specific studies that have been undertaken provide mixed findings on the status of agricultural biodiversity. For instance, Eilu et al. (2003) found high species richness in areas under annual crop production in southwestern Uganda, while Bolwig et al. (2006) found that intensive farming increases losses in species abundance and richness. Loss of indigenous crop and animal species and varieties is one of the challenges that Uganda faces (NEMA, 2015).

Pollinators are important in agricultural production, and globally, their status is of concern due to population declines. In a NEMA study (2009 in NEMA, 2015) that evaluated the potential impacts of the European Union ACP (African, Caribbean, and Pacific) Economic Partnership Agreements on Uganda's biodiversity, local communities raised concerns that pollinator bees were disappearing from commercial flower-growing areas due to heavy use of agrochemicals, thus affecting other agricultural activities within the vicinity of the flower-growing areas. Although the study was inconclusive, it suggested the need to phase out some agrochemical use in flower farms.

## **4. VALUES AND ECONOMIC POTENTIAL**

### **4.1 ECOSYSTEM GOODS AND SERVICES**

Natural ecosystems, such as forests and wetlands, provide important ecological functions including nutrient uptake, erosion control, soil conservation, local climate stabilization, recreational services, carbon sequestration, pollination, soil fertility enhancement, water storage, and reduction in extremes of water flow. They also serve as species corridors, habitat, and breeding grounds for wildlife. Forests sustain energy demands for Uganda.

The economy of Uganda depends on biodiversity, especially sectors such as tourism, livestock, and crop production. Economic valuation attributed to direct benefits from biodiversity to the fisheries, forestry, tourism, agriculture, and energy sectors is US\$546.6 million a year, and the indirect value of biodiversity is more than US\$200 million annually (Emerton and Muramira, 1999, in NEMA, 2015). The contribution of forestry to Uganda's GDP is estimated at 6 percent (NEMA, 2015). The National Development Plan II (2015) prioritized five growth opportunities and development fundamentals: agriculture, tourism, minerals, oil and gas, infrastructure, and human capital development.

Several studies have undertaken economic valuations of natural resources (Muramira and Emerton, 1999; Moyini and Muramira, 2001; and more recently WCS, 2013); however, a considerable gap remains on valuation of ecosystems. This type of data is critical for informed decision making about investment in the ENR sector and infrastructure developments. Although environmental management plays a major role in national economic activity and growth in Uganda, the national development statistics and accounting system significantly under-represent these roles. This is because they ignore subsistence-level activities and ecosystem functions and their indirect contributions to economic activity, as well as omitting any consideration of biodiversity degradation and loss as an economic cost. Valuation of Uganda's ecosystems would help build an appreciation of natural resources and support more rational resource allocation (i.e., financing from the government budget) for biodiversity conservation and environmental management.

Biodiversity provides employment opportunities both directly and indirectly. Approximately 80,000 people were directly employed in the wildlife sector as of 2009 (MPS, 2012). Tourism in Uganda is mainly nature-based and has been a leading foreign exchange earner for the country contributing more than US\$1.7 billion annually (World Travel and Tourism Council (WTTC), 2012)<sup>7</sup>. The 2011 ETOA found that there was a steady growth in nature-based tourism since 2008, growing at an average rate of 22 percent per year. The trend has continued to grow. Tourism generated a total annual revenue of US\$1.7 billion, equivalent to 9 percent of total GDP, in 2011 and this increased to about US\$2 billion (10 percent of GDP) in 2012 (WTTC, 2011, in NSOER, 2012).<sup>8</sup> Tourism is forecast to grow 6.6 percent annually, from UGX 6.4 trillion in 2015 to about UGX 13 trillion in total revenue by 2025 (10.2 percent of GDP) (WTTC, 2015).

The contribution of forests to soil and water management, carbon sequestration, and future uses for Uganda's biodiversity has been valued at more than US\$130.7 million annually (Bush, 2004, in NEMA, 2015). The actual economic benefits from other forest services—such as the provision of clean water, pollination of crops, runoff prevention, and supporting other enterprises such as the herbal medicine industry, craft making, and bee keeping—are unknown as far as this ETOA was able to discover. The only available study (Bush et al., 2004) used select forest ecosystems and found that the combined value of environmental services provided by forests in Uganda was US\$127 million. Watershed value was UGX 60.8 billion; carbon sequestration, UGX 56.4 billion; biodiversity conservation, UGX 5.8 billion; and soil conservation, UGX 99.2 billion.

In terms of livelihoods, Bush (2004, in NEMA, 2015) established that 11 to 27 percent of household cash incomes of communities around FRs were derived from forestry. In terms of employment, forestry employs more than 1 million people in the formal and informal sectors (Forest Policy, 2001, in NEMA, 2015).

Plumptre (2004), in a study on the value of forests around Rwenzori, Budongo, Kasagala, and Bungoma in Uganda, found that more than 50 percent of the respondents obtained water from the local forests. The economic value of the forest resources from the four CFRs was estimated at US\$349.5 million (Plumptre, 2004). The non-timber forest product (NTFP) non-market resources constituted the highest percentage (37

---

<sup>7</sup> This was calculated by considering total spending on travel and tourism by residents and non-residents for business and leisure purposes. It includes sectors such as hotels, airlines, airports, travel agents, and leisure and recreation services that deal directly with tourists.

<sup>8</sup> These figures are calculated from the direct contributions of travel and tourism through leisure and recreational services, hotels, airlines, airport, tour and travel agents and the wider effects from tourism investments, the supply chain (e.g., purchases of food and cleaning services by hotels), and induced income impacts from those directly and indirectly employed in the tourism sector. Recent economic and statistical analysis of tourism in Uganda shows that a total of more than 70 percent of the tourist arrivals come for business, leisure, meetings and conferences, cultural, and spiritual reasons; only about 20 percent constitute family visits; the rest are residual (World Bank, 2013).

percent) of the total economic value of the forest resources, signifying the importance of NTFPs in contributing to poverty reduction.

The potential for forestry ecotourism and conservation enterprises has not been fully exploited in Uganda. Currently, NFA operates only four ecotourism sites in CFRs and five other sites under public-private arrangements. This represents less than 2 percent of the potential ecotourism sites in FRs that could be developed and offered for income generating enterprises such as tourism. To address this gap, NFA recently embarked on a mapping exercise of the potential sites for ecotourism development in about 13 CFRs countrywide (NFA, 2105).

The ecosystems services provided by PAs include, among others, water provision, water and soil conservation, protection of water catchments, carbon sequestration, improving micro-climate, and safeguarding repositories of biodiversity, some of which has economic value and some has non-material value. For example, the Kazinga Channel in QENP and the Nile Delta in MFCA are important fish-breeding areas that contribute to maintenance of fish stocks in the adjacent lakes, Edward and Albert. More than 1 million people in Uganda and the DRC derive their livelihoods directly and indirectly from fishing activities on the two lakes (African Development Bank, 2003).

In addition to the direct economic benefits of PAs, a range of PA-related environmental, ecological, and cultural benefits contribute to economic growth and well-being of the population. Valuation of PAs has shown that the returns from ecosystem services are higher than the direct stock off-takes. A study in MFCA and Budongo Forest Reserve (see **Table 6**) showed that both PAs annually contribute products and environmental services totaling over US\$126 million (NEMA, 2014).

**Table 6: Estimates of the Values of Ecosystems Services Contributed from MFCA and Budongo Forest Reserve**

Item	Value in US \$/year (million)
Non-timber products	1.92
Non-wood forest products	2.17
Medicinal & pharmaceutical	0.88
Soil erosion	52.8
Carbon sequestration	1.5
Watershed protection & catchment services	10.6
Research and education	0.02
Aesthetic	56.92
Total	126.81

Source: *Fifth Report to the Convention on Biodiversity, NEMA, 2014*

A discussion of potential environmental goods and services and economic benefits accruing to communities from community management of PAs and from conservancies is in **Annex G**.

Uganda's fisheries industry is largely artisanal and is based on inland capture fisheries. According to the NSOER (2014), about 2.5 percent of GDP and 12 percent of agricultural GDP comes from fish; and the sector supports the livelihoods of nearly 5.3 million people, including youth and women, through direct involvement in fishing, fish processing, and trading. Fish are also a major source of animal protein with fish consumption estimated at about 10 kg/capita, slightly below the recommended World Health Organization (WHO) level of 12.5 kg/capita.

According to the Wetland Sector Strategic Plan (WSSP) 2011–2020 (2014), the overall economic value of wetlands in Uganda has not yet been quantified to establish the contribution of wetlands to the national economy. Emerton and Muramira (1999 in WSSP, 2014) estimated the purification function of the 5 km<sup>2</sup> Nakivubo wetland in Kampala at US\$1.7 million per year. Current figures for the Nakivubo wetland, which is



now only 3.5 km<sup>2</sup>, set the value at US\$1.8 million per year accruing from water treatment and purification services, crop cultivation, papyrus harvesting, brickmaking, and fish farming.

In Uganda, wetlands are responsible for employing approximately 320,000 workers directly, and they provide subsistence employment for more than 2.4 million people (MFPED, 2004, in WSSP, 2014). In rural areas in eastern Uganda, wetlands contribute close to US\$200 per year to family income for the approximately 400,000 households that engage in wetland-based activities, such as papyrus harvesting and mat-making (WID/IUCN, 2005, in WSSP, 2014).

The WSSP (2014) notes:

... these benefits are small compared to the contribution of wetlands to water supply. At least 5 million Ugandans are known to depend on water stored and released by wetlands to maintain the flow of streams, rivers, boreholes and springs (WSSP, 2001–2010). Using commercial rates for the supply of a jerry can of water in rural areas, the value of wetland water has been calculated to be worth at least US\$25 million per year, a benefit which saves the Government unnecessary investment in water supply. Today, access to safe drinking water has been increasing, at 61 percent coverage (UBOS, 2006), due to drilling of boreholes, protection of wells and springs, and treatment of water from open reservoirs, a function performed by wetlands through recharging of aquifer rocks, the target for water coverage as per 2013 is 64 percent (Ministry of Water and Environment, 2013).

**Table 7: Wetland Uses in Uganda**

<b>Wetland function</b>	<b>Value to humans</b>
Source of water	Domestic, industrial, wildlife, and livestock consumption, for example in Masaka town, Uganda crafts near Kachindo wetland
Biodiversity conservation especially conservation of flora and fauna	Recreation and wildlife; for example, Kachindo wetland (Lutembe Bay) with rich populations of birds has a high potential for tourism development; provide habitats for rare species (crested crane and sitatunga)
Habitat for breeding, feeding, and refuge of fish	Fish as source of protein for humans; food for wildlife (including birds)
Nutrient retention	Bio filters for example, Nakivubo swamp (Kampala)
Source of raw materials	For handicrafts, building, fuel
Agricultural buffer zones	Food production for local consumption especially during the dry season (e.g. rice and vegetables)
Sand and clay	For construction and source of income
Food	Wildlife, yams, rice, wild fruits
Aesthetic values	Contributes to the tourism sector
Flood control	Ability to save lives, property, and money, which would be spent on mitigation of effects of floods
Micro-climate	One of the reasons that wetlands and neighboring catchment areas are productive for agriculture

Source: Wetlands Management Department, 2011. Wetland sector Strategic Plan 2011–2020, Ministry of Water and Environment, Kampala, Uganda (Revised by ETOA Team, 2015)

## 4.2 NON-MATERIAL BENEFITS

Forests provide sanctuary, recreation, and cultural, spiritual, and religious enrichment, especially for forest-adjacent communities and forest-dwelling communities such as the Batwa (Bush, 2004). In her studies,

Kakudidi (2004) found 89 plant species in western Uganda that are used for 26 cultural and social purposes such as wedding ceremonies, religious purposes, and exorcising witchcraft.

## **BIODIVERSITY AND HEALTH**

As the NBSAP (2015) states, using herbs dates back to African traditional societies that entirely depended on biodiversity to satisfy their health needs. Plants associated with medicinal value in Uganda include moringa, aloe vera, *Prunus africana*, African tulip, and African tonic (NEMA, 2011, in NEMA, 2015). Recent ethnobotanical research identified more than 300 plants (trees, shrubs, flowers, and weeds) associated with medicinal value growing wild in Uganda. Some of these crops have gained value in the pharmaceutical industry and are now grown for their commercial value, whereas others are harvested and used locally by herbalists and have little or no economic value.

Herbal medicines have been a main source of primary healthcare in many nations, with about 80 percent of world's population still dependent on traditional medicines (Tiwari, 2008). However, use of plant biodiversity as medicine has often resulted in over-exploitation due to high global and local demand, lack of proper effective regulations, and a poorly organized value chain (Srivastava et al., 1996)

In their study in Bwindi National Park, Ndangalasi et al. (2007) found that over-exploitation of NTFPs may threaten species of high demand, but could also alter forest structure and composition. Over-exploitation of tree species, such as *Prunus africana* (African cherry) for its medicinal uses is affecting this species (Stewart, 2003). Traditionally, African cherry is used to treat diarrhea, dysmenorrhea, epilepsy, impotence, infertility, irregular menstruation, kidney disease, mental illness, eye disorders, fevers, obesity, pneumonia, arthritis, hemorrhage, hemorrhoids, hypermenorrhea, hypertension, prostate gland enlargement, and as an antibiotic, antigonorrhoeic, antihelminthic, anti-inflammatory, antimalarial, antiparasiticide, antirheumatic, and antitussive (Stewart, 2003). Because of the high demand for the bark of this tree, users often fail to follow guidelines developed to ensure sustainability, such as not harvesting the tree for at least eight years to allow for restoration of the bark after harvesting; continuous harvesting often results in the tree's death (Jimu, 2011).

The NBSAP (2015) states that:

the wide application and use of medicinal plants may have negative and far-reaching implications for biodiversity and its conservation, especially unsustainable harvesting of widely used species. On the other hand, implications for the healthcare system include the deterioration of knowledge of the correct plant materials to use and lack of adequate quality control measures in the preparation and administration of medicines among the users.

# **5. LEGAL, POLICY, AND INSTITUTIONAL FRAMEWORK**

## **5.1 NATIONAL LAWS, POLICIES, AND STRATEGIES**

The Government of Uganda's policies, regulations, plans, and strategies that apply, directly or indirectly, to the ENR sector are summarized in **Annex I**. They include:

### **POLICIES:**

- The National Environment Management Policy (1994)
- The National Policy for the Conservation and Management of Wetlands Resources (1995)



- The Uganda Wildlife Policy (2014)
- The Energy Policy for Uganda (2002)
- The National Biotechnology and Biosafety Policy (2008)
- National Oil and Gas Policy for Uganda (2008)
- The National Agriculture Policy (2013)
- Uganda National Climate Change Policy (2015)
- Forest Policy (2001)
- The National Land Use Policy (2007)

## **LAWS AND REGULATIONS**

- The Constitution of Uganda 1995
- The National Environment Act Cap 153
- Forestry and Tree Planting Act (8/2003)
- Land (Amendment) Act (2010)
- The Uganda Wildlife Education Center Bill (2013)
- Biotechnology and Biosafety Bill (2012)
- Plant Protection and Health Bill (2010)
- The National EIA Regulations (1998)
- The National Environment (Noise Standards and Control) Regulations

## **STRATEGIES, PLANS AND PROGRAMS**

- The Uganda Vision 2040
- The National Development Plan (NDP II)
- National Biodiversity Strategy and Action Plan (NBSAP)
- The NEMA Strategic Plan 2009–2014
- The Wetlands Strategic Plan
- The National Forestry Plan (2013)
- National Invasive Species Strategy, Action Plan (NISSAP)
- Agricultural Sector Development Strategy & Investment Plan (DSIP): 2010/11–2014/15 (*Agriculture for Food and Income Security*)
- District Development Plans (DDP)
- Uganda National Adaptation Program of Action (NAPA)
- Reducing Emissions from Deforestation and Forest Degradation plus (REDD+) program
- Lake Victoria Management Program
- Community Forest Management (CFM) Agreements

## **BARRIERS AND CHALLENGES TO DECENTRALIZED BIODIVERSITY CONSERVATION AND NRM**

As part of a broader decentralization process in Uganda, since 1996, ENR management outside of centrally managed PAs has been decentralized and entrusted to DLGs. Decentralization is intended to increase local

ownership and improve implementation of environmental policies, laws, and regulations. However, many districts are facing challenges in implementation due to:

- 1) Reporting channels: The district technical staff in charge of the environmental policy and regulatory framework report directly to the Ministry of Local Government (MLG) while the technical agencies they work with on a daily basis can only observe without a supervisory role or accountability.
- 2) Political interference: The district administrative function is the responsibility of the political arm (Local Council and Resident District Commissioner), who depend on electorate support. Environmental policies and regulations are often unpopular with the electorate and therefore, often fail to get the full support (especially budgetary support) of the political arm.
- 3) Challenges in mainstreaming and funding: Environmental plans, which are meant to be integrated into District Development Plans (DDPs), and which are the key planning and budgetary tool for the ENR sector, are seen as less critically in need of support than other pressing priorities such as health, infrastructure, and poverty.

As was the case when the 2011 ETOA was prepared, the ENR policies, legislation, plans, and strategies presented below and in **Annex I** are fairly comprehensive in their coverage of the sector. Of those consulted for this ETOA, experts agreed that Uganda has made considerable progress in putting in place the necessary institutional arrangements, legal and policy frameworks, and conservation programs consistent with the Convention on Biological Diversity (CBD) obligations under Article 8. Some of the milestones include local community participation in PA management and revenue sharing with local communities. Consultations during this ETOA and the joint sector review (MWE, 2015) point to persistent challenges of inadequate financing to implement the ENR policy and the regulatory frameworks.

## 5.2 INTERNATIONAL TREATIES AND CONVENTIONS

Uganda has ratified a number of international and regional treaties whose purpose is to enhance biodiversity conservation (see **Table 8**).

**Table 8: International Treaties Ratified by Uganda Related to Biodiversity Conservation**

Convention/Treaty	Date ratified
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	July 18, 1991
Convention on Wetlands (Ramsar Convention)	July 4, 1988
The Convention on Biological Diversity (CBD)	September 8, 1993
Cartagena Protocol on Bio-safety	September 11, 2003
The World Heritage Convention	November 20, 1987
East African Community Protocol on Environment and Natural Resources	January 8, 2010
The River Nile Cooperative Framework Agreement (CFA)	May 14, 2010
Common Market for Eastern and Southern Africa (COMESA) Treaty	December 8, 1994
Greater Virunga Transboundary Collaboration (GVTC)	October 30, 2015
The Arusha Declaration	November 8, 2014

In spite of ratifying CITES, trade in restricted species, such as elephant parts is still occurring. (Uganda is a conduit in the ivory trade.) Efforts are being put in place to reduce this. UWA and other agencies are enhancing intelligence gathering, and the GOU is reviewing the Wildlife Act, which, unlike the previous version, will have deterrent sanctions for offenders involved in the illegal wildlife trade.

Along with seven other countries in Africa, Uganda is a signatory to the Arusha Declaration on Regional Conservation and Combating Wildlife/Environmental Crime, which calls for a coordinated response to

combat illegal wildlife trafficking. The Declaration has the potential to bring greater awareness to the wildlife trafficking issue inside and outside of Africa, and importantly, is expected to attract funding for national, bilateral, and multilateral efforts.

Chapter 3 of the East African Community's (EAC's) Protocol on Environment and Natural Resources has a number of articles with provisions for management of transboundary resources. Specifically, Article 19 provides for partner states to protect mountain ecosystems, such as critical water catchments, conservation and heritage areas, and other areas of common strategic interest at local, national, regional, and international level. This has been operationalized in some ecosystems such as Mount Elgon where the Mount Elgon Regional Conservation Program (MERECP) was initiated to address the conservation and development needs of the Mount Elgon ecosystem through a Payment for Environmental Services (PES) approach (Mogaka et al., 2013) with a focus on clean water provision.

Article 3, Section 7 of the River Nile CFA requires Nile Basin states to take all appropriate measures, individually and, where appropriate, jointly, for the protection and conservation of the Nile River Basin and its ecosystems. This has been implemented in Uganda mainly through application of Environmental Impact Assessment (EIA) regulations on projects within the River Nile landscape; however, as noted in **Section 6**, capacity to conduct EIAs and monitor implementation, especially on highly technical projects, is limited. Initiatives that directly enhance sustainability of natural ecosystems within the Nile River Basin are scarce. In spite of Uganda being party to the agreement, wetlands and forests around Lake Victoria continue to be threatened due to urban expansion and other activities, mainly related to population increase.

Chapter 16 of the COMESA Treaty provides for cooperation in the development of natural resources, environment, and wildlife. Article 123 requires countries to cooperate and harmonize their policies and laws in the utilization of natural resources for the preservation of ecosystems and to address environmental degradation. In Uganda, this has not been fully implemented, especially for timber and other forest products.

The Greater Virunga Transboundary Collaboration (GVTC) is a mechanism for strategic, transboundary, collaborative management of the Greater Virunga Landscape. Although the GVTC Treaty was signed in Kinshasa, DRC, on September 22, 2015, GVTC was set up in 1991 by state institutions in charge of PAs in the Republic of Rwanda, the Republic of Uganda, and the DRC. Governing institutions are the Rwanda Development Board (RDB), UWA, and the *Institut Congolais pour la Conservation de la Nature* (ICCN). The partnership started with ranger collaboration to protect mountain gorillas in Mgahinga, Bwindi, Virunga, and Volcanoes NPs. Later, it expanded in scope to tourism, community conservation, and research and monitoring. The area covered now extends to central and north Virunga (DRC), Queen Elizabeth, Rwenzori Mountains, and Semuliki NPs (Uganda). It has received bilateral donor funding from USAID, Sweden, the Netherlands, and Norway. Some of its successes are joint planning on strategies, plans, and activities, and lessons shared among the involved countries, implementation of coordinated patrols, transboundary gorilla censuses, assessment of impacts of oil and gas, development of a Fire Management Plan, and construction of a briquette manufacturing center in DRC-Goma (GVTC, 2015).

### 5.3 KEY INSTITUTIONS

Government institutions responsible for biodiversity and forest conservation and management can be divided into two categories: those directly responsible (the main government institutions) and those that are closely associated (i.e., they influence and/or are influenced by biodiversity conservation). Descriptions of the core institutions are below. Descriptions of institutions closely associated with biodiversity and forest conservation are discussed in **Annex I**.

**Uganda Wildlife Authority (UWA):** This is a semi-autonomous government agency, affiliated with the Ministry of Tourism, Wildlife, and Antiquities (MTWA), mandated to ensure sustainable management of wildlife resources and supervise wildlife activities in Uganda both within and outside PAs. Over the past decade, UWA has been considered one of the most successful conservation agencies on the continent.

UWA's successes are attributed to establishment of effective management systems. These include: a streamlined institutional framework entailing clear headquarters functions and decentralized activities at PA level; strengthening of planning, implementation, and review in strategic planning; sound business planning; General Management Plans (GMPs) covering all PAs and addressing site-specific challenges; Annual Works Plans that are bottom-up and participatory, involving all wardens at PA level; a monitoring and evaluation system; and involvement of communities in benefit sharing (although greater transparency is needed).

**The National Forestry Authority (NFA):** NFA is a semi-autonomous agency affiliated with the MWE. It derives its mandate from the NFTP Act 2003, and is thus responsible for the conservation, sustainable management, and development of forests for the benefit of the people of Uganda. It is also responsible for the declaration of FRs for the purpose of protection and production of forests and forest produce. NFA manages CFRs and plantation forests. The National Forestry Policy 2001, the National Forest Plan (NFP) 2013, and the National Forestry Business Plan brought on board key stakeholders, including local communities, in the management of forests, and this effort has largely been successful.

Although NFA capacity and transparency have increased over the last decade (since the transition from Forest Department to an Authority), the NFA continues to be plagued by inefficiencies and ineffectiveness due to structural challenges, in particular, weak enforcement at the forest management unit level. This is mainly due to budgetary constraints; because of the limited budget, NFA has an inadequate number of staff to control encroachment for agriculture and other illegal and unsustainable activities. NFA was designed to be financially self-reliant but this goal has failed to materialize mainly because the environmental services provided by most of the CFRs are not easily monetized and marketed. Nonetheless, according to ETOA consultations, NFA staff technical capacity and morale are positive aspects that can be built on to continue to strengthen the organization.

**The Forest Sector Support Department (FSSD):** This department is under the directorate of Environmental Affairs in the MWE. Its core responsibilities are to formulate and oversee forestry policies, standards, and legislation; monitor the NFA; provide technical support to and monitor DFSs; promote information, advice, and advocacy to sector stakeholders; ensure effective NFP coordination and cross-sectoral linkages; and mobilize funds and other resources for the forest sector.

However, the FSSD is facing challenges, mainly related to weak technical capacity and limited financial resources to implement the FSSD mandate. Weaknesses include limited technical capacity to monitor compliance of EIAs (implementation of environmental management plans) and limited financial and technical resources to carry out audits and other monitoring, especially in forests outside PAs (pers. comms., October 2015) and of DFS activities. The FSSD is expected to mobilize resources for the forest sector but no operational resource mobilization mechanism exists. Due to lack of prioritization of the sector by authorities responsible for gazetting the regulations, the FSSD has been unable to oversee the passage of the draft forest regulations that would guide the operationalization of the NFTP Act. Given these significant challenges, of note is that FSSD has been successful in implementing REDD+; this may be because REDD+ has financial resources earmarked for its implementation. Opportunities remain to support REDD+ related interventions.

**District Forestry Services (DFSs):** The DFSs' mandate is to manage LFRs and ensure sustainable management and conservation of forest patches on privately and communally owned lands. DFSs offer services such as tree seedling distribution to farmers, planting of trees along road reserves, and training of farmers and other institutions in different aspects of forestry management.

DFSs are very weak in implementing their mandate. DFSs are under the MLG, and often forestry is not given priority in the budgetary allocation. Because DFSs are so financially constrained, they are focused on raising revenue from forest products, which often is at the expense of resource sustainability. DFS staffing is low in most districts, which also constrains operations. The staff comes under political pressure from local politicians and citizens, who want to use district forests for their benefit. DFSs that have achieved some successes have mainly been because they implement projects supported by external actors (e.g., donors) who work through government systems.

**The Directorate of Water Resources Management (DWRM):** The mandate of this directorate, under the MWE, is to develop and maintain national water laws, policies, and regulations. The directorate is also responsible for managing, monitoring, and regulating water resources through issuance of water use, abstraction, and wastewater discharge permits. Integrated Water Resources Management (IWRM) activities, coordinating Uganda's participation in joint management of transboundary waters resources and peaceful cooperation with Nile Basin riparian countries are also under its mandate. One of the main challenges for the DWRM is lack of hydrological information to make informed decisions on water resource use (pers. comms., October 2015).

**The National Environment Management Authority (NEMA):** This semi-autonomous institution, affiliated with the MWE, was established in 1995, and it derives its mandate from the National Environment Act 1995. NEMA spearheads the development of environmental policies, laws, regulations, standards, and guidelines and guides government on sound environment management in Uganda. NEMA's mandate includes the review, through EIAs, of development projects. Over the last five years, a total of 2,087 project-level EIAs were approved by NEMA out of the total of 3,533 projects for which EIA reports were submitted (MWE, 2015). On average, 66 percent of the inspected approved development projects are compliant with the EIA-approved conditions. However, only about 30 percent of the inspected approved development projects in or around wetlands are compliant with the EIA-approved conditions (NEMA, 2009, MWE, 2015).

Although NEMA is mandated to ensure compliance in the implementation of EIA, the number of staff who actually conduct compliance inspections is inadequate to implement this mandate. Staff are also constrained by limited technical and financial capacities. The situation is exacerbated due to weak coordination between NEMA and many of the lead agencies responsible for environmental matters (e.g., agencies described in this section). Conflicts between NEMA and some lead agencies have resulted when EIA reports are approved, yet lead agencies actually find the reports inadequate (poor coordination is often to blame). NEMA relies on District Environment Officers (DEO) to carry out initial stages of the EIA process, yet DEOs are anchored in the MLGs with a different supervisory framework and, therefore, it is difficult for NEMA to hold DEOs accountable.

**The Wetlands Management Department (WMD):** The WMD, under the directorate of environmental affairs in the MWE, is mandated to manage wetland resources to sustain the biophysical and socioeconomic values of the wetlands in Uganda for present and future generations. The WMD has built the capacity of local governments to assess wetland resources, and to plan and implement activities for proper management. Nonetheless, all the district wetland inventories are due for updates, necessary for use in planning, decision making, and development of district wetland action plans and management plans. As mentioned in the ETOA report, wetlands are one of the most threatened ecosystems; this is mainly due to the weak policy framework for managing and conserving wetlands and the concomitant pressure to convert them. Against that backdrop, which includes weak political will for wetland conservation, the WMD is extremely limited in its ability to fulfill its mandate.

**The Climate Change Department (CCD):** The CCD, formerly Climate Change Unit, was created in 2008, directly under the office of the Permanent Secretary within the MWE. Its mandate is to strengthen Uganda's implementation of the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol (KP). In consideration of the cross-sectoral nature of climate change interventions and the broad functions and tasks under the mandate of the CCD, strategic frameworks have been created that include the Inter-institutional Climate Change Technical Committee (ICCTC) to provide technical input to the Policy Committee on Environment that guides and advises on implementation of climate change policy (MWE, 2013). According to the Environment and Water sector review (MWE, 2015), key milestones achieved include approval (April 2015) by the Cabinet of a National Climate Change Policy (NCCP) and its costed implementation strategy. Implementation of the policy and strategy has begun through a number of projects such as the Clean Development Mechanism (CDM) Capacity Development project, which completed an assessment of the potential for CDM project development in Uganda, and trained Ugandans in CDM project development. During ETOA consultations, the Team learned that climate change mainstreaming is still a



challenge. Climate change has only been integrated into 24 District Development Plans to date, and this affects funding for and implementation of climate change activities at district level.

Donor funding to the conservation sub-sector and recent and ongoing conservation efforts, implemented by some of the institutions above, NGOs, and other stakeholders, are discussed in **Annex H**.

## **6. THREATS TO BIODIVERSITY AND TROPICAL FORESTS**

The ETOA Team held consultations, reviewed documents, and conducted site visits to identify primary threats to biodiversity and tropical forests, underlying causes of the threats, and actions needed to address the threats. The Team held internal meetings to synthesize the many threats, root causes, and actions needed; results of this analysis are presented below.

### **6.1 PRIMARY THREATS TO UGANDA'S BIODIVERSITY AND FORESTS**

The primary threats below are discussed in order of importance of the threat to biodiversity and forest conservation.

#### **6.1.1 AGRICULTURAL EXPANSION INTO NATURAL ECOSYSTEMS**

According to the NBSAP (2015), the key agents of agricultural expansion into undisturbed landscapes and PAs are small-scale farmers (more than 70 percent of the population of Uganda consider themselves small-scale farmers), migrants, and private, large-scale monoculture farming, such as palm oil and sugar cane (NFA, 2011, in NEMA, 2015). Between 1990 and 2005, agricultural land area expanded by 2 percent (from 8,400,789 ha to 8,847,591 ha, mostly in the form of small-scale agriculture (NFA, 2011, in NEMA, 2015)). Agricultural expansion remains a major deforestation driver in Uganda. Large-scale agriculture covers less land area than small-scale farms; it increased from 68,446 to 106,630 ha between 1990 and 2005 (NFA, 2011, in NEMA, 2015).

About 72 percent of the working population (aged 14–64), approximately 25.2 million people, is directly employed in subsistence agriculture, which is characterized by very low input use and widespread use of poor farming practices (UBOS, 2014; MWE, 2011). The low use of inputs increases the pressure to convert forests to cropland in search of fertile land (Nalukenge et al., 2009). Private forest owners find agriculture more profitable than forestry (MWE, 2013) and, therefore, barring incentives to retain forest, readily convert forest to crop production.

Agriculture potentially threatens the vitality and health of wetlands through draining of water and clearing of wetland vegetation, especially seasonal woodlands, bush, and thickets, negatively affecting their capability to provide ecosystem services (Turyahabwe et al., 2013). Agricultural activities such as rice growing and livestock grazing have expanded into wetlands, especially in the Lake Kyoga wetland ecosystem, Lake Victoria crescent, and southwestern Uganda.

Between 1986 and 2000, coverage of permanent subsistence farming in the Lake Victoria crescent increased by 950 percent, and seasonal subsistence farming in southwestern Uganda increased by 1,167 percent (Turyahabwe et al., 2013). Since 2008, no national study has been undertaken to determine the extent to which wetlands have been encroached by agriculture and other land use activities.

Uganda's Vision 2040 and the National Development Plan II identify agriculture as a key sector for growth. Uganda's Ministry of Agriculture has identified oil palm as a crop that can enhance economic returns from agriculture (MAAIF, 2010), and in support of this, the GOU has so far acquired 4,120 ha and plans to acquire an additional 2,000 ha for a palm oil estate on the Buvuma Islands; of the area acquired, 1,000 ha had been public land, and 3,120 ha was purchased from mailo<sup>9</sup> land owners. Some of the land was forested and some had already been converted to agriculture. According to the manager of the Vegetable Oil Development Project (pers. comms, December 2015), planting of oil palm on Buvuma Islands will begin in August 2016. By 2017, the GOU aims to have planted 6,500 ha of oil palm there (GOU, 2014). The GOU has also targeted other districts—Kibaale, Kabarole, Hoima, Masindi, Bundibugyo, Bugiri, Jinja, Iganga, and Masaka—to grow oil palm (Carerre, 2013); these plans have yet to be implemented.

The promotion of commercial crops such as oil palm reduces available arable land for the rural poor, which may force them to encroach on forests and other natural ecosystems (Fitzherbert et al., 2008). According to individuals interviewed at the NFA, FSSD, and local governments, the demand to convert forests to agricultural land is increasing, and this puts FRs, especially those with unclear boundaries, under threat.

### 6.1.2 CHARCOAL/FIREWOOD COLLECTION

The total area covered by natural forests and woodlands in Uganda is reducing rapidly as a result of land use change, mainly due to agriculture and indiscriminate cutting of trees for fuel wood (firewood and charcoal). Most of the rural biomass sources on private and communal land have already been depleted to fulfill the needs of the increasing population and associated demand.

In Uganda, biomass is the dominant energy resource for households as well as for small- and medium-scale industries such as lime, brick, and tile making and a number of agro-based industries; 92 percent of Uganda's energy needs are met from woody biomass (NEMA, 2014a). Fuel wood currently contributes more than 96 percent of energy for cooking in Uganda (NEMA, 2014b).

Charcoal production has increased from 7,975,000 tons in 2009 to 10,449,000 tons in 2013; during the same period, fuel wood for household use increased from 21,905,000 to 25,196,000 tons (UBOS, 2014). Most of this was collected from natural forests (MWE, 2011). Collection for charcoal and firewood may lead to local extinction of the most highly sought after trees, such as species of *Combretum*, *Terminalia*, *Albizia*, and more recently *Vitellaria* (shea tree) (MWE, 2011).

Charcoal producers prefer old-growth hardwood species and are responsible for the greatest loss of natural forests. Charcoal in Uganda may be extracted from public, communal, and privately owned land, CFRs, and LFRs (Mapesa et al., 2013). The impact of charcoal production is exacerbated by a license system that undervalues natural forests and rewards rapid harvests across large areas.

Woodlands have been the most affected by charcoal production, especially in central Uganda (MWE, 2011), and more recently exploitation has spread to northern Uganda and northeastern Uganda, including the Karamoja sub-region. There is no clear mechanism to regulate charcoal production to ensure

During consultations with Masindi District staff, the ETOA Team was told about an effort in Kasese wherein secondary boarding schools were using energy-saving stoves that cooked with biogas from human waste. Previously, the schools used three lorries of firewood in a week (120 lorries each term); because of the energy-saving stoves, they now use one lorry every two weeks (six over the term). Masindi District staff envisioned the amount of wood that could be saved if more schools would convert to energy-saving technologies. In Masindi, where more than 10 boarding schools are located, as well as a police training school where 10,000 people can be trained at one time, conversion to energy-saving stoves could have a significant effect on forest conservation.

<sup>9</sup> Four types of land tenure systems are recognized by the Constitution of Uganda: Customary, Mailo, freehold, and lease hold. The Land Act 1998 treats Mailo tenure almost identically to freehold tenure. Registered land can be held in perpetuity and a Mailo owner is entitled to enjoy all the powers of a freehold owner. The only significant difference is that Mailo owners should not use these powers against the interests of customary tenants, bona fide or lawful occupants. A holder of land in freehold has full power of ownership of it (<http://ssauganda.org/>).

that the industry does not result in degradation of forests and woodlands. In their studies, Namaalwa et al. (2009) reported that the rate at which wood is harvested for charcoal is unsustainable, and if not addressed, may lead to total degradation of woodlands.

Outside of PAs, the shea tree is under serious threat due to the high demand for charcoal, despite its importance to both Ugandans and the international community; this is the case in all districts where shea trees are found. The high demand is threatening the species as well as degrading the fragile savanna ecosystems where it is found. In Nakasongola District, nearly all shea trees have been cut for charcoal production (NEMA, 2014a).

To promote sustainable use of fuel wood in Uganda, the Ministry of Energy and Mineral Development (MEMD) developed a strategy for sustainable charcoal production and licensing targeting 14 charcoal-producing districts. However, the strategy has yet to be implemented. In addition, the MEMD has been developing and implementing strategies for biomass energy conservation and produced a biomass strategy. To this end, the MEMD has promoted energy-saving cook stoves. The impact of these interventions on households, charcoal producers, industrial consumers, and forests is not yet known. The MEMD and *Deutsche Gesellschaft für Internationale (GIZ)* are promoting two types of energy-saving cook stoves: improved household cook stoves and improved institutional cook stoves. Various types of briquettes that minimize or require no charcoal or fuel wood use have been promoted, mainly by donor projects, but they have yet to be widely taken up. Of those interviewed for the ETOA, most cited preferences for charcoal and firewood as reasons for not using the briquettes.

A major gap exists in establishing frameworks to reduce high taxes on alternative but affordable energy sources (e.g., solar and cooking gas). Taxes on charcoal are inconsistent, not regularized, and determined by DLGs. They are categorized as levies for transporting charcoal from one district to another and not taxes on charcoal per se. They are relatively low compared to taxes on other energy sources. The current common levies range between UGX 1,000–1,500/100 kg of charcoal compared to UGX 100,000 of the equivalent of cooking gas.

Uganda's available wood stock is estimated at 284.1 million tons with a potential sustainable biomass supply of 45 million tons. Accessible sustainable wood biomass supply stands at 26 million tons, and this amount meets only 59 percent of the total demand of 44 million tons per year (MEMD, 2014). Uganda needs to confront this situation: The continued loss of forest cover will lead to an energy crisis (NEMA, 2014b).

### **6.1.3 INFRASTRUCTURE DEVELOPMENT: URBAN EXPANSION, ENERGY DEVELOPMENT, MINING**

This section summarizes the threat posed by infrastructure developments, in particular urbanization, oil and gas, the mineral industry, and development of hydropower and geothermal energy.

Urbanization and industrialization have exerted pressure mainly on peri-urban FRs and wetlands for expansion of urban and industrial centers. Thirty percent of Uganda's wetland ecosystem, or 4.7 percent of Uganda's land area, has been lost in just 15 years (NEMA, 2014a). This is attributed to industrialization, urbanization, massive rice cultivation, and rapid population growth; an underlying cause is low compliance with environmental laws, partly driven by lack of political will (NEMA, 2014a; see underlying causes below).

The development of additional secondary cities—Arua, Gulu, Mbale, and Mbarara—and strategic towns, including Hoima in the Albertine (**Figure 5**) planned under Vision 2040, present a potential threat to forests, wetlands, and other biodiversity resources. Environmental and waste management, including pollution control, wetland management, and conservation of green areas need to be considered for sustainable urbanization (Vision 2040, 2012).



Figure 5: Map of Strategic Cities and Road Network, by 2040



Source: National Planning Authority, 2012

Inside and around PAs, urbanization and the associated infrastructure development is an emerging problem. Most tourism centers are becoming semi-urban, with developments such as hotels, bars, hospitals, schools, and markets. Waste (sewage, health care waste, and other non-biodegradable waste) is poorly managed and affecting PAs, especially waters and wetlands. In addition, water needs to be provided to meet the needs of the human population (UWA, 2011; UWA, 2014; UWA, 2015). Water for human needs and ecosystem needs is difficult to balance given the limited hydrological information and the growing human population.

Hydropower projects are considered a key ingredient for the development of Uganda's economy. Unfortunately, they come with a cost to the environment and biodiversity, especially if not well managed. In the quest to harness hydropower for development, waterfalls located in pristine areas have become targets. **Figure 6** shows a map of proposed and ongoing hydropower projects in and outside of PAs. Hydropower and the ancillary development will contribute to further fragmentation of the PA system, which already fails to provide adequate habitat and corridors to sustain viable populations of most large mammals. For example, the Ayago hydropower project is located entirely inside the MFCA. The power plant requires high-voltage transmission lines inside the park, which will require land clearing and a permanent easement. Under the proposed Karuma hydropower project, approximately 238.6 ha of Karuma Wildlife Reserve will be lost (UWA, 2012a).

Uganda's identified oil and gas resources are mainly located in national parks and wildlife game reserves within a recognized biodiversity hotspot, the Albertine Rift. About half the wells drilled so far are in wildlife PAs and other highly sensitive areas. UWA (2012a) reports that effects are already being seen on key wildlife species: Some lions have been poisoned by waters contaminated with hydrocarbons such as phenol, commonly associated with the petroleum industry (pers. comms., November, 2015).

The oil companies themselves conduct most studies on the impacts of oil and gas activities on wildlife in Uganda. The ETOA Team has been unable to access those. A joint investigation by UWA and WCS conducted between February 2010 and June 2011 (Prinsloo et al., 2011), which studied the impacts of oil exploration activities on large mammals and birds in Murchison Falls National Park (MFNP), showed most large mammals were negatively affected by the activities at a drill pad site, even pad maintenance, which involves a low level of activity. The study found that elephants, buffalos, and giraffes were most negatively affected, with avoidance up to 750–1,000 meters. Smaller mammals, such as oribi, warthog, and Uganda kob, showed some avoidance up to 250–500 meters. A high level of activities takes place within 250–500 meters of the pad, such as drilling, during which large machinery is used, making considerable noise. As such, the study found that many animals avoided the area 500–1,000 meters from the pad. The avoidance of animals and lower densities around the pads was mainly attributed to noise, vehicle traffic, and the presence of people (Prinsloo et al., 2011).

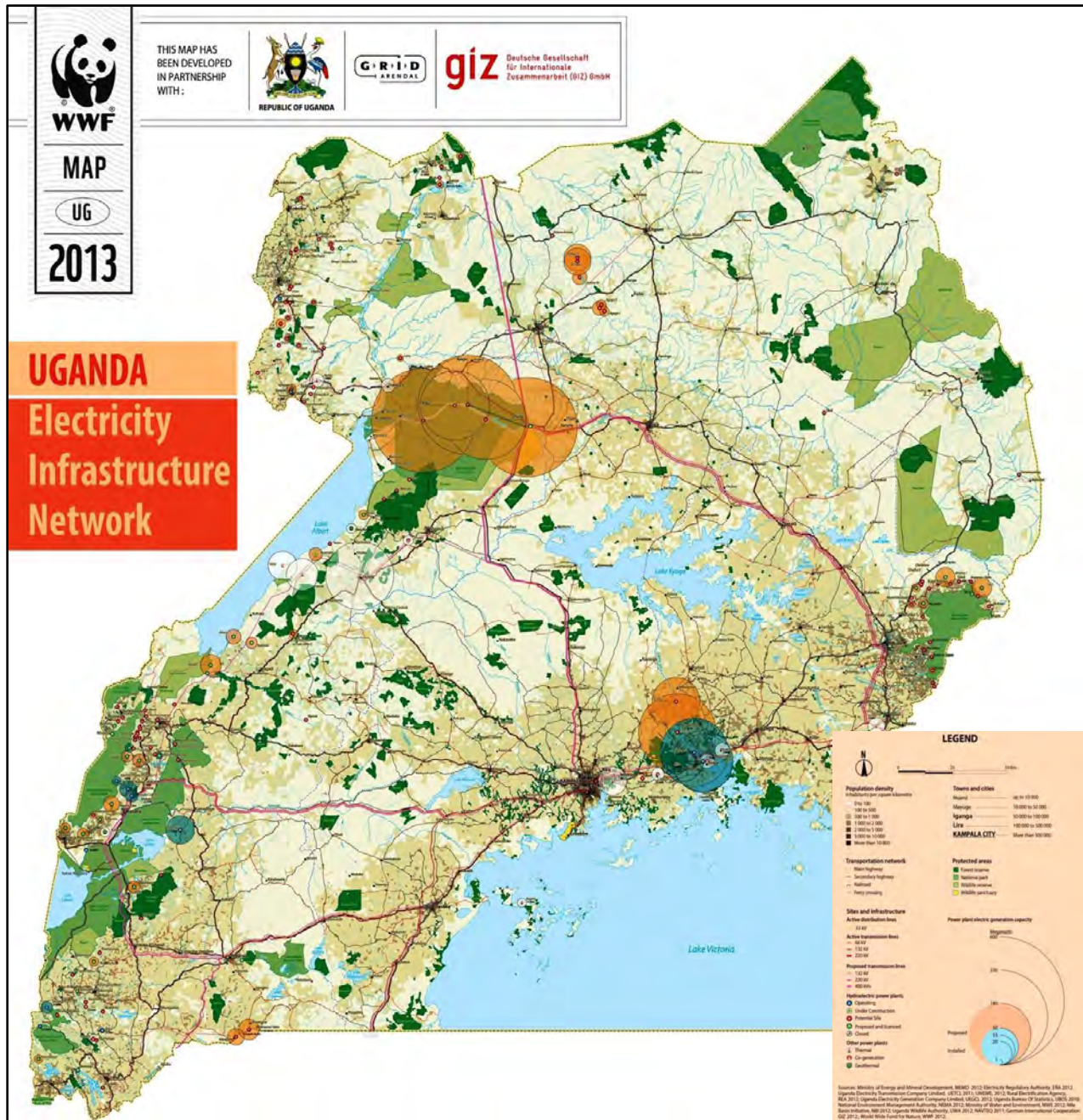
The impacts of seismic surveys were less clear in the UWA-WCS study; more data is needed to make conclusive findings. During the oil company, Total's, seismic work in MFNP, studies and monitoring were undertaken, but results of these have not yet been made public.

Oil companies also conduct most of the monitoring of mitigation measure implementation. UWA and NEMA, mandated to monitor in PAs, have weak technical capacity and are unable to carry out independent monitoring and verification; specifically, UWA's capacity to assess impacts related to noise and light is extremely weak (pers. comms., November 2015). Therefore, they rely on the oil companies' analyses and findings. There is limited government and private sector laboratory capacity in Uganda to test the full range of potential contaminants. Oil companies conduct their own lab analyses.

In MFNP (Uganda's second most visited tourist destination), some of the oil and gas wells about the Victoria Nile delta and are within the park's intensive tourism zones/game viewing sites (the Buligi circuit and Tangi areas). Ancillary infrastructure—including piping, the refinery, and central processing stations—as well as more settlements and roads, will pose threats to wildlife. Direct and indirect impacts of oil exploration include interference with wildlife movements and behaviors, visual intrusion, and noise (UWA, 2012a).



Figure 6: Proposed and Ongoing Hydropower Projects Outside and Within PAs



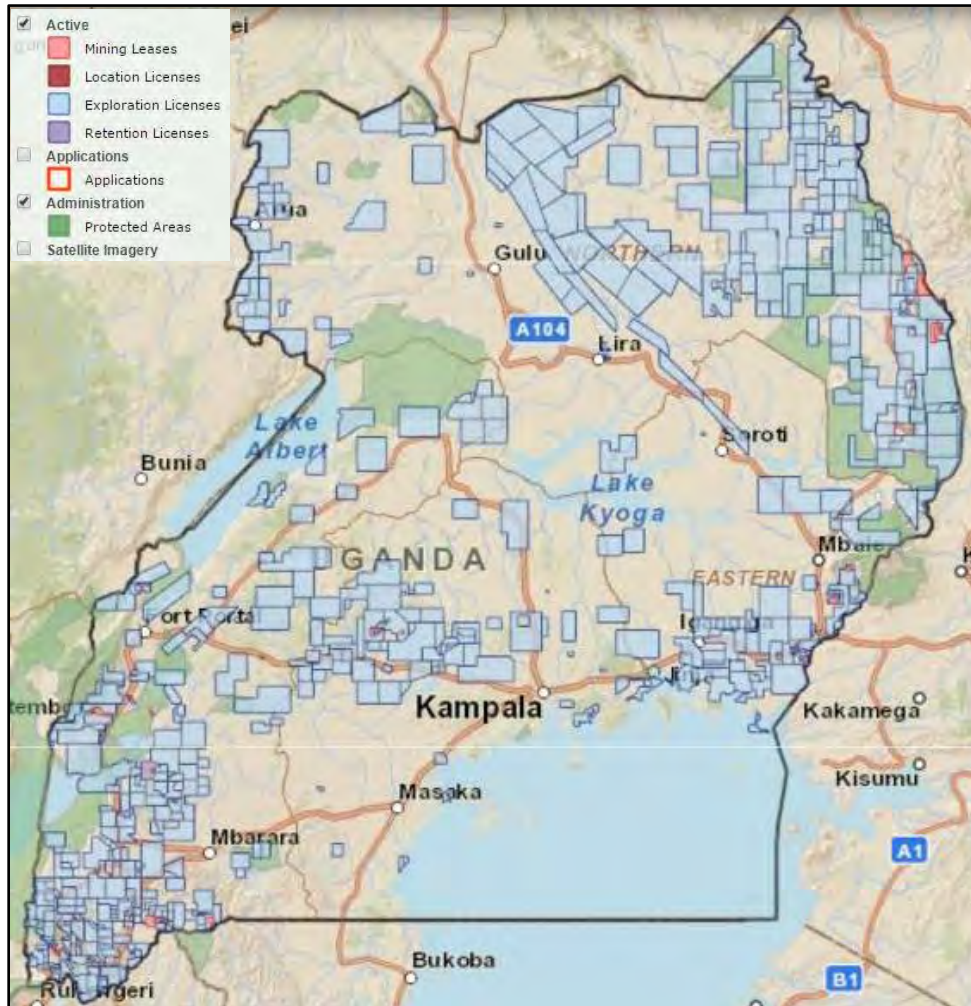
Source: WWF, 2013

Figure 7 shows proposed and existing mining sites outside and within PAs. Both large-scale commercial mining and artisanal/small-scale mining (ASM) are affecting biodiversity. Mining can contaminate soil, watercourses, and wetlands. Miners may be involved in unsustainable and illegal activities, such as harvesting wood and hunting bushmeat. ASM often has few controls and may result in more impacts than large-scale mining (pers. comms., November 2015). The ETOA Team was told that in dry years, more people relying on mining for income.



In Kidepo Valley National Park (KVNP), gold mining and sand and stone extraction is largely unmonitored, as most of it is done illegally (UWA, 2012b). This poses a serious threat to the park's biodiversity. In QECA, salt, cobalt, and copper are mined inside and around the park; discharges from these operations threaten wildlife and public health. An EIA conducted on the limestone mining permit in Dura indicated likely direct and indirect impacts on fauna and flora diversity in QECA (UWA, 2012b). Outside national parks, ASM, mainly for sand and salt, has led to the degradation of Ramsar Sites, such as Sango Bay-Musambwa Island-Kagera, Albertine Rift Valley/Lake George, Lutembe Bay, and Mabamba Bay Wetland System (Villegas et al., 2012).

**Figure 7: Proposed and Existing Mining Sites Outside and Within PAs**



PA Managers at QECA and MFCA stated to the ETOA Team that existing and proposed (in PA General Management Plans) road construction (highways) interfere with animal movements and cause animal kills from speeding vehicles. Roads also fragment habitat. The Uganda-Sudan highway has been proposed to traverse KVNP, while the debate to construct a second road through Bwindi National Park connecting Kisoro district to Kanungu has been going on since the 1990s.

Many of the proposed developments inside PAs are likely to be highly disruptive to wildlife (mining and energy development, and their ancillary infrastructure, including roads), and mitigation may not adequately

minimize impacts. Even so, the political will to deny approval may be absent, and projects may be allowed to proceed. In ETOA consultations, most experts stated that biodiversity has no political “champion.”

Outside PAs, development could be undertaken in a sustainable manner and mitigation could more successfully minimize impacts. The main issues for development outside PAs are the limited capacity of environmental agencies to evaluate impacts, develop mitigation measures, and monitor impacts, and political interference by local politicians whose constituency favors development projects over conservation.

In particular, the capacity of District Environmental Officers (DEO) in EIA and environmental monitoring needs to be strengthened. DEOs are best positioned to monitor local development projects, but they often lack access to equipment and transport. The ETOA Team was told that oil companies often provide DEOs with transport so DEOs can undertake their monitoring activities. Strengthening DEO capacity is especially important now that so many new districts have been created; new DEOs are in place, and they need training. Besides DEOs, other key sector/lead agencies also have limited capacity in EIA. The policies and laws are in place to allow consideration of environmental impacts when making decisions on development projects, but capacity (technical capacity and resources) and political will are weak. In addition, as mentioned above, ENR valuations are lacking, and if available, these could contribute to informed decision making on EIAs.

#### **6.1.4 ILLEGAL ACTIVITIES: POACHING (WILDLIFE, FISHERIES, TIMBER) AND WILDLIFE TRAFFICKING**

Illegal activities affecting biodiversity inside and outside PAs and in wetlands and water bodies include hunting for subsistence, commercial trading of wildlife and wildlife products (meat, skins, and other trophies), pitsawing, and fishing. Hunting occurs inside PAs, and on public and private land, including wetlands. According to wildlife experts consulted, the animals most affected are elephants killed for ivory; hippos mainly for meat; situngu and other antelope for subsistence consumption; and pangolins for their scales.

Animals captured for live illegal trade include chameleons, parrots, reptiles, chimpanzees, and young gorillas. However, with sustained sensitization, vigilance, and benefit sharing, illegal trade in apes is well-controlled in Uganda (CITES, 2013, in Harrison et. al., 2015; and ETOA Team interviews with Uganda Conservation Fund and UWA, 2015). Harrison et al. (2015), in a study on the drivers and impacts of wildlife crimes in Uganda, found that gorillas and chimpanzees were accidentally injured in snares and traps intended for duikers and bush pigs (killed for bushmeat) and not intentionally hunted for trade.

Poaching of elephants has been reported in QECA and MFCA; the Auditor General’s Report 2012 indicated increased levels of poaching overall in PAs. Hippos are killed mainly in QECA, and the meat is trafficked to the DRC, where markets flourish (GVTC, 2013). Illegal trafficking of elephant ivory from DRC through Uganda has been on the rise, fueled by markets in China and other Asian countries. Wildlife has been decimated on public land outside PAs.

Over-fishing and use of illegal gear are key threats to fisheries resources. Fish stocks and biodiversity are declining in all the lakes. There is selective fishing of three major commercial species, Nile perch, tilapia, and silver fish. Tilapia helped keep algae in check, but algae now blooms partly due to reduced prey, especially in Lake Victoria (Interview with fisheries staff, 2015).

Plants are also affected by illegal poaching. Although the ban on timber harvesting in Uganda is still in force, evidence is plentiful of continued illegal pitsawing in CFRs such as Budongo, Kasyoha-Kitomi, Kalinzu, and others. **Figure 16** and **Figure 17** in **Annex J** show illegal activities in Budongo and Kalinzu CFRs. Timber is logged from LFRs and private land mainly for local consumption. Illegal harvesting in Kalinzu of the threatened species, *Parinari excelsa* and *Funtumia elastic*, is occurring (GVTC, 2013).

According to FSSD staff, Uganda has been successful in reducing illegal trade in *Prunus africana*. It was recently removed from review with respect to the range status of this species at the 22nd meeting of the Plants Committee (PC22) of the Convention on International Trade in Threatened and Endangered Species (CITES). Because of the porous border and limited capacity of enforcement organs to control trafficking of

its wood, Uganda is still a conduit of *Osyris lanceolata* (its wood produces commercial aromatic oil) from neighboring countries.

### 6.1.5 HUMAN-WILDLIFE CONFLICT

Human-wildlife conflicts are becoming widespread, frequent, and severe, including in areas where they previously had not occurred. The conflicts are occurring as a result of increased interface between people and wildlife. Conflicts may result due to a variety of reasons: destruction of crops by elephants, chimpanzees, and wildlife considered problem animals and/or “vermin”<sup>10</sup>; destruction by wildlife of pastures and livestock infrastructure; spread of ticks in areas adjacent to PAs; and human injuries and deaths from elephants, chimpanzees, buffaloes, and lions.

Human-wildlife conflicts occur as a result of movements of wildlife from inside to outside PAs. Animals such as elephants, lions, buffaloes, and hippos leave PAs and go into community land, where they cause damage. Palatable crops next to PA boundaries attract the animals, as do settlements near or in wildlife conservation areas, such as fishing villages in QENP, and community wildlife management areas.

Areas with frequent and severe occurrence of elephant problem animals are Nwoya and Amuru, north of MFNP within the migratory corridor of Aswa Lolim, Kichwamba escarpment; Nyakatonzi, Kyambura, and Ishasha in QENP; and KVNP within Karenga CWA (Kampire, 2010<sup>11</sup>; ETOA Interview with UWA staff, 2015). Other problem animals of concern are crocodiles (crocodiles attack and eat fishermen both inside and outside PAs) and lions in QECA; lions and leopards in LMNP, which are under threat of poisoning by pastoralists; and chimpanzees on public and private land in Hoima, Masindi, and Kibale districts.

Crop loss to wild animals is a major source of conflict between PAs and local communities (Fungo, 2011)<sup>12</sup>. Animals commonly reported in crop raiding are elephants, bush pigs, olive baboons, and vervet monkeys.

In its presentation, “Tackling Human-Wildlife Conflict in Uganda in Order to Improve Attitudes to Ape Conservation” (January 2012), JGI stated, “encroachment into habitats previously occupied by great apes increases conflict between humans and the great apes. Humans often respond by trapping and killing the apes.”

These conflicts generate negative attitudes to wildlife resulting in loss of local support for conservation.

### 6.1.6 POLLUTION

Pollution results from agricultural, industrial, and municipal waste discharges and dumping. Pollution poses a potential threat to biodiversity through habitat modification or loss (NEMA, 2014). Pollutants alter fragile ecological systems and can lead to death of organisms. Pollutants bio-accumulate; this not only affects fish and wildlife, but also poses a grave threat to human health and wellbeing.

The discharge of industrial effluents into water systems, including rivers and lakes, as well as runoff from agricultural lands and urban settlements, brings with it the chemicals leached from these areas, thereby polluting water systems and affecting aquatic biodiversity. A review of the Ministerial Policy Statements of the MWE for the last five financial years points to deteriorating water quality as a major concern in the country. This is confirmed by the National Water Resources Assessment undertaken between 2009 and 2012.

Pollution from the use of pesticides, especially associated with cotton and flower production; herbicides used on tea and tobacco; and pollution associated with urban areas (solid waste, air pollution, etc.) pose potential

---

<sup>10</sup> Vermin are defined under the Uganda Wildlife Policy 2014 as “wild animals that are destructive, annoying, or injurious to health and with due regard to their conservation status have been declared as such by law.” In 2000, UWA declared bush pigs, olive baboons, and vervet monkeys outside PAs vermin in accordance with the Uganda Wildlife Act 2000 (Sam Amana, pers. comm, 2015).

<sup>11</sup> <http://must.ac.ug/>

<sup>12</sup> Article in Environmental Research Journal, 2011, Volume 5, Issue 2; <http://www.medwelljournals.com/abstract/?doi=erj.2011.87.92>.

threats to biodiversity (NEMA, 2011). Although use of polythene bags in Uganda has been curtailed, they continue to pose a threat to soils, soil biodiversity, aquatic and terrestrial wildlife, and birds.

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 effluent flows into Uganda's open waters, contributing to eutrophication and destruction of aquatic biodiversity, as has been seen in Lakes Victoria and George.

In PAs such as QECA, pollution from wastes containing heavy metals such as copper, lead, cobalt, chromium, and sulfide (stockpiles from the Kilembe Mine operation, 1956–1982) found its way into the extensive Ramsar wetlands and freshwater systems of Lake George and other rivers inside the park. Polluted run-off from large cobalt sulfide stockpiles close to the national park boundary has left broad de-vegetated strips of highly acidic, sterile soils along a 10 km stretch extending to Lake George, threatening northern QENP, the Lake George ecosystem and, most importantly, human and wildlife health (UWA, 2011).

Oil and gas exploration and production in the Albertine Region places a pollution burden on the biodiversity and ecology of the area. Potential sources of pollution, such as soil contamination from drill wastes and oil spills, which can affect nearby waters and aquatic life, and air emissions from combustion will continue to manifest and remain potential threats to biodiversity.

### **6.1.7 CLIMATE CHANGE**

Evidence has shown direct impacts of climate change on ecosystems within PAs in Uganda, but more systematic monitoring as well as vulnerability assessments are required to better understand the impacts and interactions at landscape scale. According to MWE (2015), the shrinking glacier coverage on the ice caps of the Rwenzori Mountains over the last 100 years is attributed to changes in temperature. The percentage of ice loss is highest on Mount Baker (96 percent), followed by Mount Speke (91 percent), and Mount Stanley (68 percent). On Mount Rwenzori, snow cover has decreased by 40 percent from 1995 to 2011. This is affecting vegetation zonation and faunal distribution, including aquatic biodiversity, as the melting snowcaps reduce water reservoirs and may affect stream flow on the mountain (MWE, 2015).

“An Overview of Climate Change and Biodiversity,” (August 2014), a USAID-commissioned report, states:

an increase in temperature or changes in rainfall intensity, distribution, and patterns are likely to have a direct effect on ecosystem functions, services, and species distribution and survival throughout Uganda. Projected climate change is likely to adversely affect the hydrological cycle of forested water catchments by weakening their capacity to maintain water cycles and recharge groundwater. This impact is likely to lead to a significant shift in flora and fauna distribution, disturb the ecological balance between species, cause habitat degradation due to increased prevalence of invasive species, and increase the occurrence of wildfires. As a result, the overall availability of ecosystem-specific goods and services that support human livelihoods is expected to be adversely affected.

### **6.1.8 ZONOTIC DISEASES**

Zoonotic diseases and vector-borne diseases currently form more than 70 percent of the global emerging and re-emerging disease burden. Emerging infectious diseases pose a significant threat to human and wildlife health. Zoonotic diseases are known to be very aggressive and contagious, passed from animals to humans, and vice versa. Uganda has experienced eight such outbreaks in the past five years (Nabukenya et al., 2014).

Several of Uganda's PAs are surrounded by livestock agriculture and dense human communities (MFCA, QECA, LMNP, and Bwindi Impenetrable National Park (BINP)), whereas others are fairly isolated (Kidepo and Semiliki). Wildlife exits PAs to forage in agricultural fields, and people live in or enter national parks for their livelihoods; this movement results in interaction and conflict among wildlife, livestock, and people



(PREDICT, 2014). Uganda also supports a thriving wildlife ecotourism industry that brings both local and foreign people into daily contact with wildlife, presenting a disease risk.

Habitat degradation, including deforestation, puts humans and wildlife into more frequent contact; loss of foraging areas means that wildlife ventures into human-occupied areas in search of food. Studies in BINP by Kalema (1995) and Nizeyi et al. (1999) showed that increased fragmentation of Bwindi forest due to agricultural expansion increases the chances of contact between gorillas and humans, which increases the transfer of pathogens and parasites between the species. In QENP, increased encroachment of pastoralists has created a hotspot for transmission of zoonotic diseases from human and livestock to wildlife and vice versa (UWA, 2011).

Work regarding zoonotic diseases in Uganda often focuses on infectious diseases that have been or may be transferred from wildlife to humans (Messenger et al., 2014). However, studies around and within wildlife PAs have shown that wildlife are also at risk of catching diseases from human and livestock populations. A study by Goldberg et al. (2008) in Kibale NP showed that genetic similarity between human/livestock and primate bacteria increased three-fold as anthropogenic disturbance within forest fragments increased from moderate to high. In BINP, the habituation process of mountain gorillas (*Gorilla beringei beringei*) and the subsequent intensification of human contacts facilitate or enhance anthroozoonotic transmission of protozoan, helminthic parasites, and *cryptosporidium* species from human to habituated gorillas (Nzeiyi et al., 1999).

Diseases and infections have the potential to wipe out an entire population, especially small populations confined to narrow areas. In 1996, an outbreak of a debilitating skin disease attributed to scabies (*Sarcoptes scabiei*) infected mountain gorillas in BINP. All four members of a gorilla group that had been habituated to tourists were clinically affected; an infant male gorilla was most severely affected and died. Investigations into this case revealed that scabies had been transmitted from humans to gorillas (Graczyk et al., 2001; Kalema et al., 2002).

The GOU's overall objective of the health sector is to "reduce morbidity and mortality from the major causes of ill-health and the disparities therein." This fails to emphasize minor causes of ill health to which zoonotic diseases belong. In the veterinary sector, the national vision for the livestock sub-sector is to "increase the production and productivity of the livestock resources on a sustainable basis." Although there is a policy on zoonoses, it mainly focuses on livestock production by improving public health standards for animal products, reducing economic losses associated with condemnation of animal products, and promoting the export of livestock and their products. Zoonoses that have no direct benefit on the livestock economy fall through the cracks.

### 6.1.9 INVASIVE SPECIES

UWA flagged invasive species as a priority concern for PA management, which they would like to see addressed (ETOA Team-UWA consultations, 2015). Invasives are affecting habitats in QECA, LMNP, KVCA, MFCA, and additional PAs (nearly half of all NPs). National Agricultural Research Organization (NARO), in a study about removing barriers to effective invasive plant management under Aichi Target 9, identified invasive species of concern that need urgent control (Table 9). Species of concern in PAs not in the NARO study include congress weed (Figure 8), a significant problem in QENP (first noted in the 1980s), and various cactus species. Spread of invasive species is forcing wildlife to roam beyond park boundaries

**Figure 8: Congress Weed in Queen Elizabeth National Park**



Photo by: Karen Menczer/ECODIT, October 2015

in search of palatable forage. This contributes to human-wildlife conflict.

**Table 9: List of Invasive Alien Species of National Concern for Urgent Control**

Species/Name	Remarks
Black wattle	Source of timber woodchips firewood and its tan is used in leather industry as well as building materials
Paper mulberry	Concern in Budongo, Mabira forests
<i>Calliandra</i>	Used in agroforestry for fodder and firewood, possible to contain
<i>Cacia</i>	Concern in Bwindi Impenetrable National Park and Budongo Forest reserve-good for fuel wood and building materials
Kariba weed; giant <i>Salvinia</i>	Floating on lakes, fern used as an ornamental, spreads quickly and choking fisheries resources
Water lettuce, Nile cabbage	Biological control needed
Water hyacinth	Water weed affecting fisheries and other organisms, eradication not feasible
<i>Lantana camara</i>	Common in fallow land and thickets and PAs (QENP, and LMNP) reduces biodiversity and eradication impossible
<i>Acacia hockii</i>	Common in southwestern Uganda, in rangelands and PAs-Lake Mburo, Murchison Falls, and QENP. Displaces other native species that are palatable to wildlife and livestock; difficult to eradicate
Striga	Weed on agricultural land-lowers crop yields, poisonous and unpalatable to wildlife, present in QENP
Sensitive plant	Common along riverbanks and lake shores, it covers other vegetation and hampers movement
Lemon grass ( <i>Cymbopogon nardus</i> )	Common in rangelands-unpalatable to livestock and wildlife, common in Rakai district and Lake Mburo National Park.

Source: Fifth Report to Convention on Biological Diversity, NEMA, 2014

#### **6.1.10 OVER-EXPLOITATION OF NATURAL ECOSYSTEMS: ESPECIALLY FORESTS, WETLANDS, RANGELANDS, AND FISHERIES**

Data on rates of forest product harvesting, especially on private land, are not readily available because of the informal nature of the forest products business in Uganda (Twongyirwe et al., 2015). Yet most logging for timber and fuel wood is currently taking place on private land (MWE, 2011). This makes it difficult for responsible agencies to enforce the principle of maximum sustainable yield provided for in the legal framework governing exploitation of natural ecosystems (GOU, 2003; GOU, 1995).

Roundwood production for monetary and non-monetary uses in Uganda increased by 4.2 percent from 2009 to 2013 (UBOS, 2014). This is despite the fact that forest cover has been declining and therefore most likely harvesting is beyond the natural rate of forest replenishment. The main agents of unsustainable timber harvesting are the pit sawyers, who supply more than 90 percent of the sawn timber, mainly from natural forests (FAO, 2005). About 80 percent of the timber on the market is illegal because very few harvesters go through the required procedures, making it difficult to monitor exploitation; this eventually results in overharvesting (WWF, 2012). The demand for timber is twice the annual allowable cut (Odokonyero, 2005).

The catch per unit effort of fish in most lakes in Uganda has declined, which is linked to over-exploitation (Paterson & Chapman, 2009; MAAIF, 2010). From 2011 to 2012, inland capture of fish declined by 6.8 percent (FAO, 2014), and in ETOA Team interviews with fisheries officers at DLGs, and with the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), this declining trend has not been addressed and therefore, is continuing.

About 6,795 powered vessels (FAO, 2014) work the lakes of Uganda, many without a license. Most local fisheries departments are weak in terms of infrastructure and staffing and are unable to enforce fishing



requirements, which often results in overfishing. Overfishing not only has implications on the economy, but also may affect the ecological balance because of its impact on the food web in the lacustrine ecosystem.

The recent executive order that restrains Police and Beach Management Units (BMUs) from enforcing fishing regulations will not only promote illegal fishing practices, but also will negatively affect the authority and respect that regulatory staff held among fishing communities; this may affect the authority of BMUs and Police even if the order is revoked. The executive order will likely lower the morale and enthusiasm of staff in the fisheries sector to implement their mandate.

Districts characterized as rangeland areas (e.g., Mbarara, Luwero, Nakasongola, and Kotido) are experiencing severe degradation due to overstocking and overgrazing (Mugerwa & Zziwa, 2014). These districts have the highest herds per household in the country (MAAIF, 2008). The national livestock census of 2008 found that districts of Karamoja sub-region, such as Kotido, Nakapiripirit, and Kaabong, had the highest numbers of cattle in the country, ranging between 519,400 and 694,300 (MAAIF, 2008).

Most parts of the cattle corridor have significant bare ground because of excessive grazing linked to keeping large herds that are not commensurate with range productivity. This not only inhibits establishment of forage plants, but also affects the seed bank for plants that are critical for sustaining the productivity of rangelands (Mugerwa et al., 2012). Pastoral communities interviewed by the ETOA Team stated that the range condition in Karamoja had declined; the ETOA Team noted increased occurrence of less desirable plants and decrease of those desired by livestock—clear evidence of poor range condition. The pastoralists were, however, unaware that they could have indirectly contributed to the degradation by keeping large herds of livestock; this lack of awareness has previously been reported (IISD/UNEP, 2005).

### **6.1.11 TRANSBOUNDARY THREATS**

Transboundary threats to biodiversity conservation and forest management are mainly poaching across borders, trafficking of wildlife and forest products, seasonal incursions of pastoralists for water and grazing resources, fishing, charcoal burning, and timber harvesting.

The majority of Uganda's PAs and high biodiversity ecosystems are located at international borders, which are largely porous. People from neighboring countries enter and engage in illegal activities and resource off-take for subsistence and commercial use. KVNP staff reported increased elephant poaching in Kidepo Game Reserve in South Sudan, which is contiguous with Uganda's PA. Reportedly, some Ugandan elephants are killed as they cross into South Sudan. UWA staff also indicated that as elephant populations in KVNP and Garamba NP dwindle due to poaching, pressure is increased on Uganda PAs. **Figure 18 in Annex J** shows major routes of illegal timber, charcoal, and wildlife trade across borders within the Greater Virunga Landscape.

### **6.1.12 HUMAN-INDUCED WILDFIRES**

Human-induced wildfires threaten biodiversity resources. Fires are set to prepare land for agricultural production and rangeland regeneration, and to flush animals and ease visibility during hunting (Nangendo et al., 2005). Fires can affect plant species composition, richness, diversity, and cover (Govender et al., 2006). In his studies conducted in QENP, Asiku (2010) found that the number of shrubs and trees and other vegetation types decreased with fire frequency. In another study in MFNP, Nangendo et al. (2005) found that frequent fires resulted in homogenous woody species (mainly those that were fire resistant). This can negatively affect herbivore species populations and composition by limiting the plant species available for forage.

Fires can inhibit establishment of fire-intolerant species, thereby reducing the biodiversity value of a habitat (Omeja et al., 2011). Swamp forest biodiversity is under threat due to human-induced wildfires, especially in the cattle corridor area of Uganda during the dry season (Omagor, 1999). Swamp fires can trigger succession changes leading to replacement of natural wetland vegetation, which eventually may affect its ecological value. Fires are common in Karamoja, a biodiversity-rich area, which is dominated by agro-pastoral communities that use fire to regenerate pasture land (NEMA, 2015).

### **6.1.13 MODERN AGRICULTURAL PRACTICES AFFECT AGRICULTURAL BIODIVERSITY**

According to the NBSAP (2015), genetic erosion of indigenous species is happening at an alarming rate as Uganda modernizes its agriculture with an emphasis on exotic species and improved varieties. For example, populations of the once-popular indigenous fruits and vegetables, such as indigenous tomatoes, are now rarely seen. Modern agriculture promotes use of improved cultivars, although some farmers retain indigenous varieties. Local communities are custodians of substantial indigenous knowledge on plant genetic resources (PGR) but documentation of this knowledge as well as inventories of the under-exploited plants and location maps for further exploration are poorly developed in Uganda (NBSAP, 2015).

The NBSAP (2015) further states that “inappropriate policies, such as the agriculture policy of modernization, implicitly encourage mono-cultural 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.”

## **6.2 UNDERLYING CAUSES**

The following are the underlying causes of the biodiversity threats described above, discussed in order of their importance as underlying causes (from the most critical to address to the least critical to address).

### **6.2.1 POPULATION GROWTH**

**Underlying cause of agricultural expansion; charcoal/firewood collection; infrastructure development; illegal activities; human-wildlife conflict; diseases/zoonotics; and over-exploitation of resources**

Uganda’s population is estimated at 34.9 million people with a density of 174 persons per km<sup>2</sup>, and it is projected to grow to 40.4 million by 2020. It will more than double in the next decade (UBOS, 2014). Uganda has one of the fastest-growing populations in the world, at 3.03 percent per annum (UBOS, 2014). The TFR was 6.9 children/woman in 1980 and only reduced to 6.2 children/woman 30 years later (2001 UDHS, in NSOER, 2014). Fertility levels are higher in the rural areas compared to urban areas with 6.8 and 3.8 children per woman respectively (NSOER, 2014). The TFR for Uganda remains among the highest in the world. About 52 percent of Uganda’s population is below 15 years of age, one of the youngest populations in the world.

One of the major causes of encroachment into PAs is high population growth and increasing demand for resources. Population growth is also an underlying cause of overfishing and unsustainable use of wetlands, and degradation and destruction of wetlands from agricultural expansion.

The major root cause of human-wildlife conflicts is increased population growth leading to increased settlements and opening of land in wildlife corridors, dispersal areas, and public forests. As more people open land for agriculture, gardens are extended up to PA boundaries, which lack buffer zones to cushion communities from wildlife conflict. Because of these factors, population growth is also an underlying cause of the spread of zoonotic diseases.

As stated in the NBSAP (2015), a principal cause of habitat conversion is human population pressure. In towns such as Kabale and Kisoro, located within the Albertine Rift region, the increased demand for agricultural land has led to land fragmentation, which is a generalized pattern observed across all of Uganda. Fragmentation eliminates connectivity between natural habitats, negatively impacting wildlife movements.

In the eastern region, population density is highest in the highlands. For example, Bududa District has a population density of 952 persons/km<sup>2</sup> compared to the national average of 124 people/km<sup>2</sup>. This high human population density has put fragile highland ecosystems at risk.

Migration—in particular, population movements from densely populated to sparsely populated areas—is directly contributing to forest loss. For example, Kibaale District is the third most populated district in Uganda and has one of the highest rates of forest loss, approximately 2.2 percent annually. This is mainly attributed to high population movement in recent years and subsequent forest clearing for agriculture.

The influx of people to Masindi District from districts such as Iganga, Sironko, and Mbale because of the scarcity of arable land, is a driver of deforestation, especially in areas adjacent to Budongo CFR (Shepherd, 2013). The war in northern Uganda and South Sudan led to displacement of populations, some of which were settled in Kiryandongo District. These have been a threat to forests adjacent to MFNP because of unsustainable exploitation, especially of wood for charcoal and firewood and draining of wetlands.

## **6.2.2 WEAK GOVERNANCE, INCLUDING WEAK IMPLEMENTATION, CONFLICTING AND OVERLAPPING MANDATES**

**Underlying cause of agricultural expansion; charcoal/firewood collection; infrastructure development; illegal activities; human-wildlife conflicts; pollution; climate change; invasive species; diseases; over-exploitation of resources; and transboundary threats; human-induced fire**

Most of those consulted for this ETOA agreed that implementation of Uganda’s policy and regulatory framework covering forests, wetlands, fisheries, and wildlife is weak. This is primarily due to lack of resources. Budgetary allocations for natural resources agencies are insufficient to implement their mandates (pers. comms., November 2015). Most agencies involved in natural resources management have too few staff in the field, not enough vehicles to conduct field-based activities, and lack other equipment and supplies. For example, limited staff capacity to effectively patrol all CFRs was mentioned by NFA during the ETOA consultations. A similar concern regarding inadequate staff numbers to effectively patrol PAs was reported in the 2013 GVTC study, “Illegal Timber, Charcoal and Wildlife Trade.” A major cause of the increased spread of invasive species is lack of monitoring for alien species, especially at customs entry points. This is due to weak governance—budgets and staff are inadequate to provide coverage at these points.

In addition to limited resources, overlapping and conflicting mandates of agencies involved in biodiversity conservation affect implementation. For example, biodiversity resources are managed by agencies anchored in different ministries, and this results in poor coordination and discourages collaboration. About 15 percent of the forests in Uganda are under UWA, whose mandate is different from NFA’s. UWA and NFA are anchored in different ministries, yet they manage relatively similar biodiversity. This results in duplication of roles between UWA and NFA, especially in CFRs that are managed for biodiversity conservation. Attempts to develop a memorandum of understanding between UWA and NFA to coordinate their activities have failed because of the different policy and legal frameworks that govern the two agencies (LTS, 2010).

The NFA (under the MWE) has had conflicts with the DFS (under the MLG) in enforcing regulations on exploitation of forest products. Illegal dealers in forest products take advantage of this by claiming that their products have been approved by NFA when they encounter DFS officials and vice versa. The result is that forest resources that have been unsustainably or illegally harvested fall through the cracks. FSSD, which is mandated to supervise both the NFA and DFS, has statutory limitations on how far they can sanction DFS if they are found flouting the standards since their reporting system falls under a different ministry.

DFS is mandated to manage LFRs and provide support to private forest owners, but they cannot effectively perform as provided for in the Forestry Policy of 2001 and NFTP Act (2003) because of their limited structure. They are anchored within DLGs, which are under a different ministry (MLG), so some districts have not created a DFS due to resource limitations. This further renders forests in those districts under threat (MWE, 2010). Where they do exist, DFS are mainly engaged in revenue generation rather than conservation interventions because of pressure by local politicians to be revenue producers (Turyahabwe et al., 2015), which is usually done by implementing projects (e.g., Mubende District has successfully done this).

Addressing climate change's impacts on biodiversity is hampered by weak governance. The GOU, similar to most governments, prioritizes actions that address climate change as it directly affects the human population. Studies on climate change impacts on biodiversity and funding for mitigation measures to minimize impacts on biodiversity get short shrift.

No active framework or structure promotes the coordination of various agencies involved in the management of biodiversity resources. This is often exacerbated by institutional rivalries created by disparities in resources, especially at the district level (MWE, 2010). Poor coordination of agencies leads to poor enforcement of the laws governing use of natural ecosystems, and thereby threatens biodiversity.

The NBSAP (2015) states that Uganda's politicians are known to disregard some important aspects of biodiversity management in favor of quick political gains (especially in this electoral season). Some politicians have supported initiatives to degazette PAs, and with a growing trend toward government encouraging land use change from PAs to agriculture or industrial expansion. Urban FRs in the districts of Arua, Entebbe, Fort Portal, Gulu, Kabale, Lira, Mbale, Mbarara, Soroti, Kalangala, Kapchorwa, Kitgum, Nebbi, Ntungamo, and Rukungiri are earmarked for degazettment to create space for town expansion. Forests in Bugala Islands in Lake Victoria have been converted to oil palm plantations; Namanve CFR in Kampala was converted for an industrial park; part of Pian Upe Wildlife Reserve in Karamoja for large-scale agriculture; and the South Busoga forests, some of the few remaining forests at the shores of Lake Victoria, are likely to be converted by government-supported land use change.

### **6.2.3 LIMITED OPPORTUNITIES FOR OFF-FARM EMPLOYMENT**

#### **Underlying cause of agricultural expansion; charcoal/firewood collection; illegal activities; human-wildlife conflict; and over-exploitation of resources**

Limited alternative livelihood options can lead to over-exploitation of biodiversity resources both inside and outside PAs, including wetlands since biodiversity resources are viewed as sources of livelihood.

Most of the settlements around woodland areas in Uganda have low employment opportunities. This drives people to harvest trees for charcoal production as a livelihood option (Namaalwa et al., 2007). This situation is currently more severe in north and northeastern Uganda because civil strife has only recently ended there, and the communities have few, if any other income generation options besides charcoal production and subsistence agricultural production.

In eastern Uganda, lack of options was an important driver of agricultural encroachment in Namatala wetland (Namaalwa et al., 2013). Throughout rural Uganda, local communities' continued dependence on forest resources is in part attributed to lack of alternative income generation options (Obua et al., 2010).

The high number of subsistence farmers exacts a cost on natural resources, including land, soil, and associated biodiversity. Poor agricultural practices, such as overstocking of rangeland and cultivation on steep slopes, contribute to erosion and siltation of water bodies, thereby altering ecosystems and species composition.

### **6.2.4 POVERTY**

#### **Underlying cause of agricultural expansion; charcoal/firewood collection; illegal activities; human-wildlife conflict; and over-exploitation of resources**

Twenty percent of the population of Uganda is characterized as poor. Forty-three percent of the population is at risk of falling back into the poverty trap in the event that a shock occurs (MFPED, 2014). Studies (Nakakaawa et al., 2010; Aggrey et al. 2010) found a link between poverty and degradation of forests and other natural ecosystems in western and central Uganda. In a study by Harrison et al. (2015), lack of basic necessities or the means to obtain them was found to be one of the key drivers to wildlife crime in Uganda.

Poor communities in Uganda cut trees for timber, firewood, and poles to obtain income for their household needs (Tabuti et al., 2003; Harrison, 2013). Overfishing in Uganda's lakes is attributed to poverty (von

Sarnowski, 2004), as well. The Nakivubo wetlands are currently threatened because most of the urban poor in Kampala and Wakiso districts derive their livelihoods directly from them through activities such as washing cars, cultivating crops, and establishing settlements; this jeopardizes their ecological functions (Kabumbuli and Kiwazi, 2009). In his studies in eastern Uganda, Mafabi (2000) found that, among other factors, wetlands and their biodiversity were under threat due to poverty.

Other authors (Ainemucunguzi et al., 2009; Kabagumya, 2001) have reported that lack of reliable health care (a facet of poverty) has led to excessive use of certain medicinal plants around PAs in southwestern Uganda, especially *Prunus africana*, whose bark is used for making medicine to treat prostate cancer and other ailments (Harrison et al., 2015). Especially in Kyenjonjo, Bundibugyo, Bushenyi, and Kibaale districts, people are cutting the bark of this tree to raise income without following the recommended guidelines for its sustainability (pers. comm., Issa Katwesige, FSSD, 2015).

The NBSAP gives this example: The relationship between biodiversity and poverty can be measured using indicators of wealth status, such as land ownership, ability to hire labor, resources to ensure education, quality of housing, and income levels. Based on these indicators, communities who live around PAs are considered generally poor (Plumptre et al., 2003, in NBSAP, 2015). Poor communities around PAs depend largely on resources from within the PAs, such as fuel wood, timber, non-timber forest products, game meat, and water. Importantly, poverty limits a community's capacity to develop alternatives to resources found within PAs.

## 6.2.5 INSECURITY OF LAND TENURE

### **Underlying cause of agricultural expansion; charcoal/firewood collection; and over-exploitation of resources**

More than 70 percent of the land in Uganda is customarily owned with no formal registration of tenure rights. Communities in areas that have development prospects such as the Albertine Region, where oil and gas reserves are being developed, are losing communal land to speculators, sometimes through illegal means (CRED, 2014). For instance, some communities in Kiryamboga in Buseruka sub-county, and Rwamutonga village in Bugambe sub-county in Hoima District, are now living in a camp due to unscrupulous registration of their communal land as freeholds by private individuals who anticipate tapping revenue from oil development (CRED, 2015). Some of the members of these communities have started earning their livelihoods through conversion of trees in neighboring woodlands into charcoal (pers. comm., Bashir Twesigye, CRED, 2015), hence threatening biodiversity in that landscape. Surrounding wetlands are being reclaimed for brick making by the displaced community, which potentially affects the ecological integrity of the wetland ecosystem in the area where they have temporarily settled.

## 6.2.6 GOVERNMENT POLICIES THAT FAIL TO PROMOTE CONSERVATION

### **Underlying cause of agricultural expansion; infrastructure development; charcoal/firewood collection; pollution; and over-exploitation of resources**

Some government policies outside the biodiversity sector affect forests and other natural ecosystems. Uganda has a very ambitious infrastructure development plan in its quest to become a middle-income country by 2040. The theme for the budget speech 2014/2015 was "Maintaining the Momentum: Infrastructure for Growth and Socio-Economic Transformation." Among the notable infrastructure projects that the country intends to pursue are:

- the construction of an inland container depot at Mukono;
- the redevelopment and upgrading of facilities at Port Bell and Jinja piers;
- a standard gauge railway;
- construction of major hydropower plants at Karuma and Isimba;
- oil refinery development in Hoima; and



- construction of 650 km of the following roadway nationwide (MFPED, 2014): Kabwoya – Kyenjojo; Tirinyi – Pallisa – Kumi/Kamonkoli; Kapchorwa – Suam; Rukungiri – Kihhi – Ishasha – Kambuga; Kihhi – Kanungu – Kambuga; Mbale – Bubulo – Lwakhakha; Kyenjojo – Fort Portal; Gulu – Atiak; Ishaka – Rugazi – Katunguru; Sironko – Namunsi – Muyembe; Nansana – Busunju; and Mbale – Nkokonjeru.

The processes for implementing these projects are underway. They will need large expanses of land, which will likely lead to destruction of natural ecosystems that host biodiversity.

The GOU is increasing its tax base to become self-reliant, including taxing alternative energy sources such as liquefied petroleum gas (LPG). Alternative energy sources could reduce pressure on forests and woodlands that are currently the main energy source for most people in Uganda, but not if they are taxed out of reach.

Lack of a minimum wage makes off-farm employment unattractive, contributing to the high number of people deriving livelihoods from natural capital such as forests, wetlands, rangelands, and arable land at the expense of biodiversity conservation. A minimum wage can lead to poverty reduction (Maloney & Mendez, 2004). Poverty is one of the drivers of exploitation of natural ecosystems with high biodiversity areas, such as forests and wetlands, acting as safety nets (Geist & Lambin, 2002; Kissinger et al. 2012).

The NBSAP (2015) cites this example of a policy that fails to support conservation objects:

According to the National Development Plan (2010), Uganda’s economic policy objectives emphasize maintenance of macro-economic stability and discipline, equitable and efficient collection and utilization of public resources, and removal of constraints on private sector competitiveness. This policy puts emphasis on generation of quick economic returns which also influences the manner in which environment and natural resources base is utilized to yield such quick returns. However, the environment and natural resources sector is not prioritized among key sectors because returns from investments in natural resources such as soil and water conservation, tree planting and land management, to mention a few, take a long period to be realized. This policy has led to attempts to convert landscapes meant for biodiversity conservation, especially forest and wetlands, to other forms of land use thus diminishing their biodiversity.

## 6.2.7 CLIMATE CHANGE

**Underlying cause of agricultural expansion; charcoal/firewood collection; infrastructure development; illegal activities; human-wildlife conflicts; invasive species; diseases; over-exploitation of resources**

Impacts of climate change are likely to drive vulnerable communities adjacent to PAs for their livelihoods. NEMA (2009) presents a case of rampant livestock overgrazing in the Teso wetlands during droughts, degrading them substantially. Because of this, they no longer functioned as water reservoirs, which, in part, contributed to the destructive floods of 2009 in the region.

The proliferation of invasive plant species within and around PAs is caused, at least partially, by climate change. For example, *Lantana camara*, an invasive species that displaces pastures in grassland wildlife areas, is resilient to dry conditions. The increased colonization of congress weed, *Parthenium hysterophorus* (see **Figure 8**), in QEPA is linked to drier soil conditions due to increases in temperatures and a lowered water table.

Climate change, which to some extent is causing bush and woodland encroachment into savanna habitats, is an underlying cause of human-wildlife conflicts: Suitable habitats within the parks are reduced, forcing the animals to move outside of PA boundaries to find pasture (ETOA Team-UWA consultations, 2015).

Climate change and variability may be contributing to general changes in vegetation patterns. For example, during an ETOA meeting with MFC management, the Team was informed that bush has colonized a large



part of the southern area of the MFCA and Karuma Reserve and, therefore, is becoming uninhabitable for some wildlife such as the Uganda kob, which require open areas. Also discussed at the ETOA meeting with MFCA was the effect of drought conditions on fires; fires have been rampant in MFCA during the recent short drought spell. Uncontrolled high-intensity fires affect vegetation patterns and are also considered a factor encouraging bush encroachment in MFCA.

**Annex K** has additional information about climate change as an underlying cause of biodiversity threats.

## 6.2.8 POOR PERCEPTION OF THE VALUE OF NATURAL ECOSYSTEMS

### Infrastructure development; illegal activities; and over-exploitation of resources

In general, Ugandans have little appreciation of the value of the goods and services provided by forests and other ecosystems, the real costs of managing them, or the costs of destroying them. As a consequence, natural capital such as forests and wetlands are undervalued and not prioritized in resource allocation and national accounting systems. In some situations, they are perceived as available land for other “productive” uses. Fifteen local governments have applied for the degazettment of FRs in their jurisdiction to pave way for urban growth (<http://www.newvision.co.ug/D/8/14/666891>). This is exacerbated by the fact that most of the ecological functions of forests and wetlands do not have an immediate market, which is an incentive for proponents of conversion to other land uses. This is in spite of the fact that Uganda’s economy relies on sectors such as agriculture, fishing, and tourism, all of which depend on the state of natural ecosystems.

# 7. ACTIONS NECESSARY TO CONSERVE BIODIVERSITY, TROPICAL FORESTS, AND THE ENVIRONMENT

## 7.1 ACTIONS NECESSARY

Based on the ETOA Team’s review of key documents; on consultations with government, NGOs, university staff, and other experts; site visits; and on internal ETOA Team discussions, the Team developed the following list of actions needed to address the underlying causes of the threats (**Table 10**). The threat and its underlying causes were considered when developing an “action needed.” Each action needed addresses at least one underlying cause. If the action needed is from a GOU document, the document citation is included in the table. The actions needed may be implemented by the GOU, private sector, donors, or other stakeholders.

**Table 10: Actions Needed to Address the Underlying Causes of Threats**

Threats	Underlying causes	Actions needed
<b>Agricultural expansion into natural ecosystems</b>	<ul style="list-style-type: none"> <li>• Population growth</li> <li>• Weak governance</li> <li>• Limited alternative sources of livelihoods/limited opportunities for off-farm employment</li> <li>• Poverty (includes widespread use of poor</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Focus on girls’ education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Support the preparation and implementation of land use plans.</li> <li>• Put in place a coordination mechanism for government institutions involved in biodiversity conservation to help harmonize activities and to improve coordination and collaboration.</li> <li>• Improve accountability and transparency of government decision</li> </ul>

Threats	Underlying causes	Actions needed
	agricultural practices) <ul style="list-style-type: none"> <li>• Insecure land tenure</li> <li>• Government policies that fail to promote conservation</li> <li>• Climate change, which places increased stress on households that rely on agriculture, and forces them to encroach into PAs for productive land</li> </ul>	making. <ul style="list-style-type: none"> <li>• Promote conservation agriculture/climate-smart agriculture (eco-agriculture) to improve agricultural practices; promote value addition, off-farm opportunities.</li> <li>• Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.</li> <li>• Improve literacy and access to educational opportunities especially in rural areas (SOER, 2012).</li> <li>• Create employment opportunities to absorb the many unemployed youth (SOER, 2012).</li> <li>• Support local communities to register their customary land, especially those with natural ecosystems, to incentivize their sustainable use.</li> <li>• Operationalize registration of community forests on communal land to ensure their sustainable management.</li> <li>• Operationalize collaborative management of forests, wetlands, and wildlife conservation areas to encourage sustainable management.</li> <li>• Establish climate change resilience programs in vulnerable communities around PAs.</li> <li>• Integrate climate change into development and sectoral plans at national and district levels and provide funds for implementation.</li> </ul>
<b>Charcoal/ Firewood collection</b>	<ul style="list-style-type: none"> <li>• Population growth and increased demand</li> <li>• Weak governance</li> <li>• Limited alternative sources of livelihoods</li> <li>• Poverty</li> <li>• Insecure land tenure</li> <li>• Government policies that fail to promote conservation</li> <li>• Climate change, which places increased stress on households and forces them to encroach into PAs for alternative income sources</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Include sustainable biomass energy supply plan and energy audit plan in investment plans and environmental mitigation plans of heavy biomass users (tea, tobacco, paper, vegetable oil, and institutions, such as police, schools, prisons, army, etc.) (Biomass Energy Strategy, 2014).</li> <li>• Promote and support research programs on biofuels (NBSAP, 2015).</li> <li>• Establish programs on alternative clean energy sources and promote use of efficient energy technologies (SOER, 2014).</li> <li>• Establish rural livelihood projects in agriculture, forestry, livestock, and alternative energy equipment sales and repairs especially targeting the youth and vulnerable households,</li> <li>• Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves,</li> <li>• Create employment opportunities to absorb the many unemployed youth (SOER, 2012),</li> <li>• Promote alternative energy, charcoal, and firewood production as a sustainable enterprise by: publishing and implementing the FSSD Manual for promoting energy crops/trees for charcoal, which should include technical guidance on appropriate charcoal production tree species, charcoal kilns, and conversion rates; establishing a buy-in by forestry and conservation agencies to recognize charcoal making as an enterprise that in actual fact could promote conservation; reviewing and revising forestry and energy policies regarding charcoal production and trade as an economic enterprise. This should include licensing procedures and fees; working with beneficiary groups to enhance monitoring and tracking to check illegal production and trade to avoid market distortions; and identifying and working with local champions and communities that are already engaged in the charcoal production and trade.</li> </ul>

Threats	Underlying causes	Actions needed
		<ul style="list-style-type: none"> <li>• Develop economic instruments to encourage activities that enhance biodiversity conservation and discourage activities that impact negatively on biodiversity (NBSAP, 2015).</li> <li>• Establish taxation reforms to reduce tax on alternative clean energy sources such as electricity, cooking gas, and solar equipment to promote conservation of wood fuel sources.</li> <li>• Support local communities to register their customary land, especially those with natural ecosystems, to incentivize their sustainable use.</li> <li>• Operationalize registration of community forests on communal land to ensure their sustainable management.</li> <li>• Operationalize collaborative management of forests, wetlands, and wildlife conservation areas to encourage sustainable management.</li> <li>• Establish climate change resilience programs in vulnerable communities around PAs.</li> </ul>
<b>Infrastructure development</b>	<ul style="list-style-type: none"> <li>• Population growth</li> <li>• Weak governance (limited institutional capacity of UWA and NFA staff to evaluate and monitor developments and limited capacity of national EIA practitioners to undertake professional EIAs that adequately guide developments)</li> <li>• Government policies that fail to promote conservation</li> <li>• Poor perception of the value of natural ecosystems</li> <li>• Climate change: As the productivity of agriculture, forestry, and fisheries decreases, people increasingly migrate to fragile ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Establish an EIA capacity-building program for all sector lead agencies and national EIA practitioners on planning, monitoring, and management of different types of infrastructure development (developments inside PAs).</li> <li>• Establish an EIA capacity-building program for all sector lead agencies, NEMA, and Districts (developments outside of PAs) and for national EIA practitioners.</li> <li>• Sensitize the public on the value of natural ecosystems.</li> <li>• Valuation of natural ecosystems for all PAs, integrating them into the national planning and accounting systems (developments inside PAs); valuation of natural ecosystems (developments outside of PAs); generate comprehensive and up-to-date data on economic values of ENR and ecosystem services and contribution to the economy (SOER, 2012).</li> <li>• Set up a biodiversity offset trust fund to ensure no net biodiversity loss due to petroleum activities as well as to compensate for the residual impacts of petroleum exploration that cannot be mitigated. This could also cover other infrastructure development activities (NBSAP, 2015).</li> <li>• Strengthen climate change resilience within all production sectors to minimize poverty and food insecurity that lead to migration /encroachment to fragile ecosystems.</li> <li>• Provide adequate support for policies and programs that take into account the interactions between population dynamics, climate change, and development (Climate Change Strategy, 2012).</li> </ul>
<b>Illegal activities: Poaching and wildlife trafficking</b>	<ul style="list-style-type: none"> <li>• Population growth and increasing demand for resources</li> <li>• Weak governance (includes limited institutional capacity, especially for patrolling CFRs and LFRs and forests outside PAs; limited enforcement of illegal hunting and</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Prepare and implement land use plans.</li> <li>• Build law enforcement capacity of relevant institutions, NFA and UWA, to: Undertake patrols to detect and control illegal activities; establish and equip outposts in key and strategic areas; recruit staff to meet planned staffing levels; strengthen capacity of the agencies to regulate off-takes and effectively monitor legal trade for sustainable management of the resources; strengthen the</li> </ul>

Threats	Underlying causes	Actions needed
	<p>timber harvesting)</p> <ul style="list-style-type: none"> <li>• Limited alternative sources of livelihoods</li> <li>• Poverty</li> <li>• Poor perception of the value of natural ecosystems</li> <li>• Climate change: Vulnerable communities adjacent to PAs are more likely to resort to PA resources for their livelihood</li> </ul>	<p>Environment Protection Unit; strengthen technical capacity and provide equipment for wildlife crime detection, legal procedures, investigations, and prosecution for relevant law enforcement staff including police. UWA has established an intelligence and investigation unit that needs capacity building and implementation of the National Ivory/Elephant Action Plan.</p> <ul style="list-style-type: none"> <li>• Strengthen monitoring systems to enable informed decisions for improved resource management and protection.</li> <li>• Demarcate and secure boundaries of all PAs including CFRs.</li> <li>• Strengthen the National CITES Authority (wildlife and plants) through domestication of the Treaty.</li> <li>• Expedite finalization of the Wetlands Bill, which will strengthen protection of wetlands by paving way for the gazettelement of critical and vital wetlands some of which have been demarcated.</li> <li>• Formulate and gazette the wildlife regulations to operationalize the Act.</li> <li>• Foster cooperation (rather than competition) and information sharing among PA agencies with all relevant law enforcement agencies and stakeholders at local, national, regional, and international level (Lusaka Agreement, Interpol, CITES, army, etc.) to stop illegal timber, wildlife trade, and trafficking.</li> <li>• Improve literacy and access to educational opportunities especially in rural areas (SOER, 2012).</li> <li>• Raise awareness of the public, policy makers, judiciary, and local communities about the value and importance of wildlife and forestry resources and the need to combat wildlife and other natural resources crime.</li> <li>• Promote alternative income-generating and conservation enterprises (including community-based tourism) in and outside PAs including alternative sources to bushmeat protein.</li> <li>• Promote value addition schemes for agricultural production.</li> <li>• Strengthen community conservation and collaboration activities: Promote establishment of community forests, registration of private forests, agroforestry, and forest plantations; promote legal wildlife utilization schemes outside PAs (e.g., wildlife farming to support legal trade).</li> <li>• Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.</li> <li>• Enhance agricultural production through eco-agriculture technologies to improve land productivity and food security.</li> <li>• Under REDD+, prioritize sites—possibly illegal activity hotspots and highly degraded forests including outside PAs.</li> </ul>
<p><b>Human-wildlife conflict</b></p>	<ul style="list-style-type: none"> <li>• Population growth leading to increased settlements and opening of land in wildlife corridors, dispersal areas, and public forests. As more people open land for agriculture, gardens are extended up to PA boundaries because PAs lack buffer zones to cushion communities from</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Build capacity for UWA: Train and equip the HWC (human-wildlife conflict) unit across the PA estate to manage problem animals (crocodile capture and relocation, response action towards rogue elephants and stray animals).</li> <li>• Maintain barriers where they are effective—buffalo wall, live fence barriers along boundaries.</li> <li>• Set up a HWC fund, perhaps harmonized or as part of the current Biodiversity Trust Fund effort, to sustain HWC unit activities as well as compensation for death and injuries.</li> </ul>

Threats	Underlying causes	Actions needed
	<p>wildlife.</p> <ul style="list-style-type: none"> <li>• Weak governance (includes limited capacity of UWA to effectively address human-wildlife conflicts) further intensifies conflicts resulting in indiscriminate killing of wildlife especially crocodiles, lions, and leopards; communities are dissatisfied with the UWA response rate and the inability to compensate those affected by injuries or death</li> <li>• Limited opportunities for off-farm employment</li> <li>• Poverty</li> <li>• Spread of invasives (also a primary threat), including bush and woodland encroachment on savanna habitats, has worsened the problem because suitable habitats for animals within the parks are reduced, forcing the animals to move outside of the park boundaries to find pasture</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and implement National Guidelines for management of HWC.</li> <li>• To complement UWA efforts in HWC management and build capacity for DLGs to manage problem animals and promote establishment of wildlife scout teams to engage in HWC and wildlife-related management programs (e.g., Human-Gorilla (HUGO) scheme for problem mountain gorillas, scouts in Karenga CWMA).</li> <li>• Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.</li> <li>• Enhance agricultural production through eco-agriculture technologies to improve land productivity and food security; and promote value addition, off-farm opportunities.</li> <li>• Strengthen revenue sharing funds and other collaborative activities to support HWC and other conservation interventions that motivate affected communities to protect wildlife; promote wildlife utilization schemes outside PAs that generate direct benefits to the affected communities; promote and popularize conservation enterprises that indirectly contribute to HWC management.</li> <li>• Continue to explore and pilot methods of control-scare and repellent actions (e.g., pepper spray, animal dung).</li> <li>• Promote establishment of buffer areas with crops that are non-palatable to target wildlife species.</li> <li>• See actions needed for invasive management/control below.</li> </ul>
<b>Pollution</b>	<ul style="list-style-type: none"> <li>• Weak governance</li> <li>• Government policies that fail to promote conservation</li> </ul>	<ul style="list-style-type: none"> <li>• Set up environmental standards to limit the production or discharge of harmful (hazardous) wastes or products in sensitive ecosystems (NBSAP, 2015).</li> <li>• Monitor and support management of pollution and waste in vulnerable ecosystems (NBSAP, 2015).</li> <li>• Strengthen the capacity of EIA practitioners in evaluation of pollution and waste management impacts.</li> <li>• Promote inclusion and implementation of “Polluter Pays” principle in government policies and legislation.</li> <li>• Institute re-use/disposal strategy for old mosquito nets distributed under the national malaria control program so as to promote environmentally sound methods, which are at the same time beneficial to the communities.</li> </ul>
<b>Climate Change</b>	<ul style="list-style-type: none"> <li>• Weak governance</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct studies on climate change impacts on biodiversity and mitigation measures.</li> <li>• Establish a UWA and NFA program to monitor impacts of climate change on ecosystems within and around PAs to better understand and respond to the impacts.</li> <li>• Support climate change mainstreaming in District planning and budget processes, to include development and tracking of climate change indicators.</li> </ul>

Threats	Underlying causes	Actions needed
		<ul style="list-style-type: none"> <li>• Develop National Adaptation Plan (NAP) development framework for different sectors.</li> </ul>
<b>Zoonotic diseases</b>	<ul style="list-style-type: none"> <li>• Population growth</li> <li>• Weak governance (limited institutional capacity)</li> <li>• Climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Establish inter-sectoral coordination mechanism (Min. of Health, MAAIF, and conservation agencies) for monitoring, surveillance, and management of zoonotic diseases.</li> <li>• Provide adequate support for policies and programs that take into account the interactions between population dynamics, climate change, and development (Climate Change Strategy, 2012).</li> <li>• Strengthen capacity for inter-sectoral institutions on monitoring, management, and control of zoonotics.</li> <li>• Strengthen disaster risk reduction programs on zoonotics and emerging pandemics both in humans and wildlife.</li> <li>• Develop onsite laboratories and facilities for rapid diagnosis and response in high risk areas.</li> </ul>
<b>Invasive species</b>	<ul style="list-style-type: none"> <li>• Weak governance (includes lack of monitoring enforcement of the introduction of alien species, especially at customs entry points; lack of detailed inventory of the extent and quantities and management information on invasives to support planning and management)</li> <li>• Climate change is contributing to vegetation changes</li> </ul>	<ul style="list-style-type: none"> <li>• Establish a monitoring and information system for invasives to support planning and management.</li> <li>• Fast track establishment of the tree fund (under the NFTP Act, perhaps be harmonized with the Biodiversity fund) to be accessed by NFA and eligible private sector/individuals for re-planting of NFA harvest plantations and establishing new ones, and planting for mitigation on private land.</li> <li>• Support NFA to undertake forest rehabilitation and restoration.</li> <li>• Promote physical, biological, and chemical environmentally friendly methods to removal invasive species, based on approved EIAs.</li> <li>• Conduct and disseminate research on appropriate ways of controlling invasives.</li> <li>• Support UWA to develop and implement an invasive species management action plan in partnership with relevant research institutions.</li> <li>• Strengthen monitoring and implementation of national regulations of movement of biological specimens across Ugandan borders.</li> <li>• Build capacity to inspect machinery for infrastructure development (e.g., oil exploration and drilling machines, road works, and hydropower civil works equipment) for traces of biological specimens that could be potential alien invasives.</li> <li>• Support studies on climate change contribution to the spread of invasives and measures to address impacts.</li> </ul>
<b>Over-exploitation of natural ecosystems</b> (especially forests, wetlands, rangelands, and fisheries)	<ul style="list-style-type: none"> <li>• Population growth and increasing demand for resources</li> <li>• Weak governance (limited capacity, budget, information)</li> <li>• Limited alternative sources of livelihoods</li> <li>• Poverty</li> <li>• Insecurity of tenure</li> <li>• Government policies that don't promote conservation</li> <li>• Poor perception of the</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>• Carry out regular wildlife census.</li> <li>• Carry out biodiversity inventories—forest, wetlands, fisheries, agriculture, and rangelands—and update the national biodiversity data bank.</li> <li>• Implement the National Range Land policy.</li> <li>• Finalize the Land Use and Land Use Planning policy.</li> <li>• Undertake national land cover/vegetation/soil mapping.</li> <li>• Enhance agricultural production through eco-agriculture technologies to improve land productivity and food security, and</li> </ul>



Threats	Underlying causes	Actions needed
	<p>value of natural ecosystems</p> <ul style="list-style-type: none"> <li>Climate change: Vulnerable communities adjacent to PAs are more likely to resort to PA resources for their livelihood</li> </ul>	<p>promote value addition and off-farm opportunities.</p> <ul style="list-style-type: none"> <li>Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.</li> <li>Support local communities to register their customary land, especially those with natural ecosystems.</li> <li>Operationalize registration of community forests on communal land to ensure their sustainable management.</li> <li>Operationalize collaborative management of forests, wetlands, and wildlife conservation areas to encourage sustainable management.</li> <li>Develop and utilize biodiversity and ecosystem services valuation tools to quantify and monitor the environmental, economic, and social value of biodiversity (NBSAP, 2015).</li> <li>Utilize biodiversity and ecosystem services valuation to mainstream biodiversity into decision making and to develop a business case for biodiversity (NBSAP, 2015).</li> <li>Integrate the value of ecosystems as natural capital into national accounting and reporting processes.</li> <li>Develop Community Action Plans for biodiversity conservation in strategic areas (NBSAP, 2015).</li> <li>Develop access and benefit-sharing arrangements with indigenous and local communities (NBSAP, 2015).</li> </ul>
<b>Transboundary threats</b>	<ul style="list-style-type: none"> <li>Weak governance (includes lack of law and order to protect ecosystem resources in PAs in neighboring countries; civil wars and strife where armed militias engage in illegal activities to finance their agendas)</li> <li>Government policies that fail to promote conservation (includes lack of harmonized policy and legislation among neighboring countries; limited collaboration on control of illegal activities allowing them to thrive in international border areas)</li> </ul>	<ul style="list-style-type: none"> <li>Establish cross-border wildlife monitoring programs, such as elephant collaring.</li> <li>Arrange for and hold regular meetings to share information and allow for joint planning at national and regional level with key law enforcement agencies (police, customs, army, etc). The Greater Virunga Transboundary Collaboration (GVTC) (DRC, Rwanda and Uganda); lessons learned can replicated in other locations with transboundary resources.</li> <li>Undertake joint law enforcement operations at border points and across borders based on GVTC experiences.</li> <li>Work within existing regional networks and law enforcement organizations to build capacity of countries to combat wildlife trafficking and other crimes and to support cross-border investigations and law enforcement. (Regional agencies, such as LATF, which has led investigations leading to arrests of ivory smugglers (<a href="http://lusakaagreement.org/">http://lusakaagreement.org/</a>) would be one of the agencies to work with. However, only seven African countries are members, and countries like DRC, one of the key sources of wildlife trafficking, is not a member.)</li> <li>Negotiate and sign a MoU/declarations to enhance cooperation and joint action in addressing forestry and wildlife crime within the EAC and DRC.</li> <li>Under the EAC protocols, develop and prepare a regional law enforcement strategy in line with the International Consortium on Combating Wildlife Crime, illegal logging, and other natural resources related illegal activities.</li> </ul>
<b>Human-induced wildfires</b>	<ul style="list-style-type: none"> <li>Weak governance (includes weak enforcement of laws and ordinances on fires)</li> </ul>	<ul style="list-style-type: none"> <li>Put in place fire communication and early warning systems.</li> <li>Improve coordination and capacity of agencies involved in enforcement of fire regulations.</li> <li>Formulate and implement local policies and ordinances to reduce human-induced fires in areas of important biodiversity.</li> </ul>
<b>Modern agricultural</b>	<ul style="list-style-type: none"> <li>Government policies that fail to promote</li> </ul>	<ul style="list-style-type: none"> <li>Formulate and implement land use plans that balance conservation, agriculture and other livelihoods.</li> </ul>

Threats	Underlying causes	Actions needed
practices	conservation (includes the need to expand foreign exchange earnings, government fiscal policies that promote targeted crops such as oil palm)	<ul style="list-style-type: none"> <li>Promote off-farm industries and employment opportunities.</li> <li>Increase the flow of benefits, including payment for ecosystem services for private forest owners, to discourage conversion to cropland (NBSAP, 2015).</li> <li>Promote agricultural practices that minimize the negative impacts of agricultural production on biodiversity and ecosystem functioning (NBSAP, 2015).</li> <li>Support local communities to diversify their livelihoods through biodiversity-friendly enterprises, which eases pressure on the resource base (NBSAP, 2015).</li> </ul>

## 7.2 EXTENT TO WHICH USAID IS ADDRESSING THE ACTIONS NECESSARY

Table 11 below addresses the second requirement of FAAs 118 and 119, extent to which USAID is addressing the necessary actions for sustainable forest management and biodiversity conservation.

**Table 11: Extent to Which USAID Is Addressing the Actions Needed for Sustainable Forest Management and Biodiversity Conservation**

Actions needed	Extent to which USAID is addressing and/or plans to address the actions needed
<p><b>Agricultural expansion into natural ecosystems</b></p> <ol style="list-style-type: none"> <li>Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>Support the preparation and implementation of land use plans.</li> <li>Put in place a coordination mechanism for government institutions involved in biodiversity conservation to help harmonize activities and to improve coordination and collaboration (NBSAP, 2015).</li> <li>Improve accountability and transparency of government decision making.</li> <li>Promote conservation agriculture/climate-smart agriculture (eco-agriculture) to improve agricultural practices; promote value addition, off-farm opportunities.</li> <li>Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.</li> <li>Improve literacy and access to educational opportunities especially in rural areas (SOER, 2012).</li> <li>Create employment opportunities to absorb the many unemployed youth (SOER, 2012).</li> <li>Support local communities to register their customary land, especially those with natural ecosystems, to incentivize their sustainable use.</li> <li>Operationalize registration of community forests on communal land to ensure their sustainable management</li> <li>Operationalize collaborative management of forests, wetlands, and wildlife conservation areas to encourage sustainable management.</li> <li>Establish climate change resilience programs in vulnerable communities around PAs.</li> <li>Integrate climate change into development and sectoral plans at national</li> </ol>	<ol style="list-style-type: none"> <li>DO 2 (but not targeting critical biodiversity areas)</li> <li>DO 2 (but not targeting critical biodiversity areas)</li> <li>Biodiversity Program is currently addressing this in select areas; DO 1 and 3</li> <li>DO 1 (but not explicitly addressing)</li> <li>DO 1 (but not explicitly addressed)</li> <li>DO 3</li> <li>Biodiversity Program is currently addressing this in select areas; DO 1 and DO 3</li> <li>DO 1 and DO 2 (but not specifically targeting only rural areas)</li> <li>DO 1 (not specifically targeting only youth); DO 2</li> <li>DO 1 (but not explicitly addressing land registration)</li> <li>DO 1 (but not explicitly addressed)</li> <li>DO 1 and DO 3 (but wetlands not explicitly addressed)</li> <li>DO 3 (but not specifically targeting communities near PAs at this time)</li> <li>Enabling Environment for Agriculture (EEA) is currently addressing this in targeted Feed the Future (FTF)</li> </ol>

Actions needed	Extent to which USAID is addressing and/or plans to address the actions needed
and district levels and provide funds for implementation.	Districts; DO 1
<p><b>Charcoal/Firewood collection</b></p> <ol style="list-style-type: none"> <li>1. Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>2. Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>3. Include sustainable biomass energy supply plan and energy audit plan in investment plans and environmental mitigation plans of heavy biomass users (tea, tobacco, paper, vegetable oil, and institutions, such as police, schools, prisons, army, etc.) (Biomass Energy Strategy, 2014).</li> <li>4. Promote and support research programs on biofuels (NBSAP, 2015).</li> <li>5. Establish programs on alternative clean energy sources and promote use of efficient energy technologies (SOER, 2014).</li> <li>6. Establish rural livelihood projects in agriculture, forestry, livestock, and alternative energy equipment sales and repairs especially targeting youth and vulnerable households.</li> <li>7. Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves</li> <li>8. Create employment opportunities to absorb the many unemployed youth (SOER, 2012).</li> <li>9. Promote alternative energy, charcoal, and firewood production as a sustainable enterprise by: publishing and implementing the FSSD Manual for promoting energy crops/trees for charcoal, which should include technical guidance on appropriate charcoal production tree species, charcoal kilns, and conversion rates; establishing a buy-in by forestry and conservation agencies to recognize charcoal making as an enterprise that in actual fact could promote conservation; reviewing and revising forestry and energy policies regarding charcoal production and trade as an economic enterprise. This should include licensing procedures and fees; work with beneficiary groups to enhance monitoring and tracking to check illegal production and trade to avoid market distortions; and identifying and working with local champions and communities that are already engaged in the charcoal production and trade.</li> <li>10. Develop economic instruments to encourage activities that enhance biodiversity conservation and discourage activities that impact negatively on biodiversity (NBSAP, 2015).</li> <li>11. Establish taxation reforms to reduce tax on alternative clean energy sources such as electricity, cooking gas, and solar equipment to promote conservation of wood fuel sources.</li> <li>12. Support local communities to register their customary land especially those with natural ecosystems, to incentivize their sustainable use.</li> <li>13. Operationalize registration of community forests on communal land to ensure their sustainable management.</li> <li>14. Operationalize collaborative management of forests, wetlands, and wildlife conservation areas to encourage sustainable management.</li> <li>15. Establish climate change resilience programs in vulnerable communities around PAs.</li> </ol>	<ol style="list-style-type: none"> <li>1. DO 2 (but not targeting critical biodiversity areas)</li> <li>2. DO 2 (but not targeting critical biodiversity areas)</li> <li>3. Not addressing</li> <li>4. Not addressing</li> <li>5. Power Africa</li> <li>6. DO 2 and DO 3 (but not explicitly addressing youth in all these livelihood areas at this time)</li> <li>7. Biodiversity Program is currently supporting this in select areas; DO 1 and DO 3</li> <li>8. DO 2</li> <li>9. DO 3, (but not explicitly targeting alternative energy or youth)</li> <li>10. DO 1</li> <li>11. Power Africa</li> <li>12. DO 1 (but not explicitly addressing land registration)</li> <li>13. DO 1 (but not explicitly addressed)</li> <li>14. DO 1 and 3 (but wetlands not explicitly addressed)</li> <li>15. DO 3 (but not specifically targeting communities around PAs at this time)</li> </ol>
<p><b>Infrastructure development</b></p> <ol style="list-style-type: none"> <li>1. Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>2. Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>3. Establish an EIA capacity-building program for all sector lead agencies and</li> </ol>	<ol style="list-style-type: none"> <li>1. DO 2 (but not targeting critical biodiversity areas)</li> <li>2. DO2 (but not targeting critical biodiversity areas)</li> <li>3. Environmental Management for the</li> </ol>

Actions needed	Extent to which USAID is addressing and/or plans to address the actions needed
<p>national EIA practitioners on planning, monitoring, and management of different types of infrastructure development (developments inside PAs).</p> <ol style="list-style-type: none"> <li>4. Establish an EIA capacity-building program for all sector lead agencies, NEMA, and districts (developments outside of PAs) and for national EIA practitioners.</li> <li>5. Sensitize the public on the value of natural ecosystems.</li> <li>6. Valuation of natural ecosystems for all PAs integrating them into the national planning and accounting systems (developments inside PAs); valuation of natural ecosystems (developments outside of PAs); generate comprehensive and up-to-date data on economic values of ENR and ecosystem services and contribution to the economy (SOER, 2012).</li> <li>7. Set up a biodiversity offset trust fund to ensure no net biodiversity loss due to petroleum activities as well as to compensate for the residual impacts of petroleum exploration that cannot be mitigated (NBSAP, 2015). This could also cover other infrastructure development activities.</li> <li>8. Strengthen climate change resilience within all production sectors to minimize poverty and food insecurity that lead to migration/encroachment to fragile ecosystems.</li> <li>9. Provide adequate support for policies and programs that take into account the interactions between population dynamics, climate change, and development (Climate Change Strategy, 2012).</li> </ol>	<p>Oil Sector (EMOS) is currently addressing this only for oil and gas but not other infrastructure development</p> <ol style="list-style-type: none"> <li>4. EMOS is currently addressing this only for oil and gas but not other infrastructure development</li> <li>5. Not addressing with the public at this time (EMOS is currently addressing valuation only with GOU and DLGs)</li> <li>6. EMOS is currently addressing this from a capacity building perspective with UWA and NFA; DOI</li> <li>7. Support to Uganda Biodiversity Trust Fund could include some aspects of this</li> <li>8. DO 3 (for targeted production sectors)</li> <li>9. DO 1 (but not explicitly addressing population dynamics)</li> </ol>
<p><b>Illegal activities: Poaching and wildlife trafficking</b></p> <ol style="list-style-type: none"> <li>1. Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>2. Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>3. Prepare and implement land use plans.</li> <li>4. Build law enforcement capacity of relevant institutions, NFA and UWA, to: Undertake patrols to detect and control illegal activities; establish and equip outposts in key and strategic areas; recruit staff to meet planned staffing levels; strengthen capacity of the agencies to regulate off-takes and effectively monitor legal trade for sustainable management of the resources; strengthen the Environment Protection Unit; strengthen technical capacity and provide equipment for wildlife crime detection, legal procedures, investigations, and prosecution for relevant law enforcement staff including police. UWA has established an intelligence and investigation unit that needs capacity building and implementation of the National Ivory/Elephant Action Plan.</li> <li>5. Strengthen monitoring systems to enable informed decisions for improved resource management and protection.</li> <li>6. Demarcate and secure boundaries of all PAs, including CFRs.</li> <li>7. Strengthen the National CITES Authority (wildlife and plants) through "domestication" of the Treaty.</li> <li>8. Expedite finalization of the Wetlands Bill, which will strengthen protection of wetlands by paving way for the gazettement of critical and vital wetlands, some of which have been demarcated.</li> <li>9. Formulate and gazette the wildlife regulations to operationalize the Act.</li> <li>10. Foster cooperation (rather than competition) and information sharing among PA agencies with all relevant law enforcement agencies and stakeholders at local, national, regional and international level (Lusaka Agreement, Interpol, CITES, army, etc.) to stop illegal timber, wildlife trade, and trafficking.</li> <li>11. Improve literacy and access to educational opportunities especially in</li> </ol>	<ol style="list-style-type: none"> <li>1. DO 2 (but not targeting critical biodiversity areas)</li> <li>2. DO 2 (but not targeting critical biodiversity areas)</li> <li>3. Biodiversity Program is currently supporting this in select areas; DO 1 and 3</li> <li>4. Biodiversity Program provides support to UWA and NFA that partially addresses this</li> <li>5. Biodiversity Program and EMOS currently provide support to GOU to strengthen monitoring</li> <li>6. DO 1 (planned support for NFA through USFS)</li> <li>7. DO 1 (planned support through US Department of the Interior)</li> <li>8. Not addressing</li> <li>9. Not currently addressing (Wildlife Act under review)</li> <li>10. DO 1</li> <li>11. DO 2 (but not specifically targeting only rural areas)</li> <li>12. Not addressing with the public at this time (EMOS is currently addressing valuation with GOU and DLGs)</li> <li>13. Biodiversity Program is currently addressing this in targeted areas; DO 3</li> <li>14. DO 1 and 3</li> </ol>

Actions needed	Extent to which USAID is addressing and/or plans to address the actions needed
<p>rural areas (SOER, 2012).</p> <ol style="list-style-type: none"> <li>12. Raise awareness of the public, policy makers, judiciary, and local communities about the value and importance of wildlife and forestry resources and the need to combat wildlife and other natural resources crime.</li> <li>13. Promote alternative income-generating and conservation enterprises (including community-based tourism) in and outside PAs, including alternative sources to bushmeat protein.</li> <li>14. Promote value addition schemes for agricultural production.</li> <li>15. Strengthen community conservation and collaboration activities: Promote establishment of community forests, registration of private forests, agroforestry and forest plantations; promote legal wildlife utilization schemes outside PAs (e.g., wildlife farming to support legal trade).</li> <li>16. Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.</li> <li>17. Enhance agricultural production through eco-agriculture technologies to improve land productivity and food security.</li> <li>18. Under REDD+, prioritize sites—possibly illegal activity hotspots and highly degraded forests including outside PAs.</li> </ol>	<ol style="list-style-type: none"> <li>15. Biodiversity Program is currently addressing this</li> <li>16. Biodiversity Program is currently addressing this</li> <li>17. DO3</li> <li>18. Not addressing</li> </ol>
<p><b>Human-wildlife conflict</b></p> <ol style="list-style-type: none"> <li>1. Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>2. Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>3. Build capacity of UWA: Train and equip the HWC unit across the PA estate to manage problem animals (crocodile capture and relocation, response action towards rogue elephants, and stray animals).</li> <li>4. Maintain barriers where they are effective—buffalo wall, live fence barriers along boundaries.</li> <li>5. Set up a HWC fund (perhaps harmonized or as part of the current Biodiversity Fund effort) to sustain HWC unit activities as well as compensation for death and injuries.</li> <li>6. Develop and implement National Guidelines for management of HWC.</li> <li>7. To complement UWA efforts in HWC management and build capacity for DLGs to manage problem animals, promote establish wildlife scouts teams to engage in HWC and wildlife-related management programs (e.g., HUGO scheme for problem mountain gorillas, scouts in Karenga CWMA).</li> <li>8. Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.</li> <li>9. Enhance agricultural production through eco-agriculture technologies to improve land productivity and food security; promote value addition, off-farm opportunities.</li> <li>10. Strengthen revenue-sharing funds and other collaborative activities to support HWC and other conservation interventions that motivate affected communities to protect wildlife; promote wildlife utilization schemes outside PAs that generate direct benefits to the affected communities; promote and popularize conservation enterprises that indirectly contribute to HWC management.</li> <li>11. Continue to explore and pilot methods of control-scare and repellent actions (e.g., pepper spray, animal dung).</li> <li>12. Promote establishment of buffer areas with crops that are non-palatable to target wildlife species.</li> </ol>	<ol style="list-style-type: none"> <li>1. DO 2 (but not targeting critical biodiversity areas)</li> <li>2. DO 2 (but not targeting critical biodiversity areas)</li> <li>3. Biodiversity Program is currently addressing certain elements of HWC</li> <li>4. Biodiversity Program is currently addressing certain elements of this</li> <li>5. Uganda Biodiversity Trust Fund could address</li> <li>6. Not addressing</li> <li>7. Biodiversity Program is currently addressing this</li> <li>8. Biodiversity Program is currently addressing this</li> <li>9. DO 1 and DO 3</li> <li>10. Biodiversity Program is currently addressing certain elements of this; DO 1</li> <li>11. Biodiversity Program is currently addressing certain elements of this</li> <li>12. Biodiversity Program is currently addressing certain elements of this</li> <li>13. See Invasive Species below</li> </ol>



Actions needed	Extent to which USAID is addressing and/or plans to address the actions needed
13. See actions needed for invasive management/control below.	
<p><b>Pollution</b></p> <ol style="list-style-type: none"> <li>1. Set up environmental standards to limit the production or discharge of harmful (hazardous) wastes or products in sensitive ecosystems (NBSAP, 2015).</li> <li>2. Monitor and support management of pollution and waste in vulnerable ecosystems (NBSAP, 2015).</li> <li>3. Strengthen the capacity of EIA practitioners in evaluation of pollution and waste management impacts.</li> <li>4. Promote inclusion and implementation of “Polluter Pays” principle in government policies and legislation.</li> <li>5. Institute re-use/disposal strategy for old mosquito nets distributed under the national malaria control program so as to promote environmentally sound methods, which are at the same time beneficial to the communities.</li> </ol>	<ol style="list-style-type: none"> <li>1. EMOS is addressing this from a capacity building perspective for oil and gas only</li> <li>2. EMOS is currently addressing this from a capacity building perspective for oil and gas only</li> <li>3. EMOS is currently addressing this for oil and gas only</li> <li>4. Not addressing</li> <li>5. Addressing as part of current health program</li> </ol>
<p><b>Climate change</b></p> <ol style="list-style-type: none"> <li>1. Conduct studies on climate change impacts on biodiversity and mitigation measures.</li> <li>2. Establish an UWA and NFA program to monitor impacts of climate change on ecosystems within and around PAs to better understand and respond to the impacts.</li> <li>3. Support climate change mainstreaming in District planning and budget processes, to include development and tracking of climate change indicators.</li> <li>4. Develop National Adaptation Plan (NAP) development framework and for different sectors.</li> </ol>	<ol style="list-style-type: none"> <li>1. DO 1 and 3 (not explicitly focusing only on climate change impacts on biodiversity)</li> <li>2. DO 3, but not specifically focusing on ecosystems within and around PAs</li> <li>3. EEA is currently addressing this in FTF Districts; DO 1 and 3</li> <li>4. Not addressing at this time</li> </ol>
<p><b>Zoonotic diseases</b></p> <ol style="list-style-type: none"> <li>1. Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>2. Focus on girls’ education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>3. Establish inter-sectoral coordination mechanism (Min. of Health, OPM, MAAIF, and conservation agencies) for monitoring, surveillance, and management of zoonotic diseases.</li> <li>4. Provide adequate support for policies and programs that take into account the interactions between population dynamics, climate change, and development (Climate Change Strategy, 2012).</li> <li>5. Strengthen capacity for inter-sectoral institutions on monitoring, management, and control of zoonotics.</li> <li>6. Strengthen disaster risk reduction programs on zoonotics and emerging pandemics both in humans and wildlife.</li> <li>7. Development onsite laboratories and facilities for rapid diagnosis and response in high-risk areas.</li> </ol>	<ol style="list-style-type: none"> <li>1. DO 2 (but not targeting critical biodiversity areas)</li> <li>2. DO 2 (but not targeting critical biodiversity areas)</li> <li>3. Not addressing</li> <li>4. DO 1 (but not explicitly addressing population dynamics)</li> <li>5. Not addressing</li> <li>6. DO 3 (but not explicitly addressing zoonotics)</li> <li>7. Not addressing</li> </ol>
<p><b>Invasive species</b></p> <ol style="list-style-type: none"> <li>1. Establish a monitoring and information system for invasives to support planning and management</li> <li>2. Fast track establishment of the tree fund (under the NFTP Act perhaps be harmonized with the Biodiversity Fund) to be accessed by NFA and eligible private sector/individuals for re-planting of NFA harvest plantations and establishing new ones, and planting for mitigation on private land.</li> <li>3. Support NFA to undertake forest rehabilitation and restoration.</li> </ol>	<ol style="list-style-type: none"> <li>1. Not addressing</li> <li>2. Not addressing</li> <li>3. Not addressing</li> <li>4. Not addressing</li> <li>5. Not addressing</li> <li>6. Not addressing</li> <li>7. Not addressing</li> <li>8. Not addressing</li> </ol>

Actions needed	Extent to which USAID is addressing and/or plans to address the actions needed
<ol style="list-style-type: none"> <li>4. Promote physical, biological, and chemical environmentally friendly methods to removal invasive species, based on approved EIAs.</li> <li>5. Conduct and disseminate research on appropriate ways of controlling invasives.</li> <li>6. Support UWA to develop and implement an invasive species management action plan in partnership with relevant research institutions.</li> <li>7. Strengthen monitoring and implementation of national regulations of movement of biological specimens across the Ugandan borders.</li> <li>8. Build capacity to inspect machinery for infrastructure development (e.g., oil exploration and drilling machines, road works, and hydropower civil works equipment) for traces of biological specimens that could be potential alien invasives.</li> <li>9. Support studies on climate change contribution to the spread of invasives and measures to address impacts.</li> </ol>	<ol style="list-style-type: none"> <li>9. Targeted research under Education and Research to Improve Climate Change Adaptation (ERICCA) and NARO activities could support this</li> </ol>
<p><b>Over-exploitation of natural ecosystems especially forests, wetlands, rangelands, and fisheries</b></p> <ol style="list-style-type: none"> <li>1. Prioritize family planning programs in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>2. Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.</li> <li>3. Carry out regular wildlife census.</li> <li>4. Carry out biodiversity inventories—forest, wetlands, fisheries, agriculture, and rangelands—and update the National Biodiversity Databank.</li> <li>5. Implement the National Range Land policy.</li> <li>6. Finalize the Land Use and Land Use Planning policy.</li> <li>7. Undertake national land cover/vegetation/soil mapping.</li> <li>8. Enhance agricultural production through eco-agriculture technologies to improve land productivity and food security; promote value addition, off-farm opportunities.</li> <li>9. Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.</li> <li>10. Support local communities to register their customary land especially those with natural ecosystems.</li> <li>11. Operationalize registration of community forests on communal land to ensure their sustainable management.</li> <li>12. Operationalize collaborative management of forests, wetlands, and wildlife conservation areas to encourage sustainable management.</li> <li>13. Develop and utilize biodiversity and ecosystem services valuation tools to quantify and monitor the environmental, economic, and social value of biodiversity (NBSAP, 2015).</li> <li>14. Utilize biodiversity and ecosystem services valuations to mainstream biodiversity into decision making and to develop a business case for biodiversity (NBSAP, 2015).</li> <li>15. Integrate the value of ecosystems as natural capital into national accounting and reporting processes.</li> <li>16. Develop Community Action Plans for biodiversity conservation in strategic areas (NBSAP, 2015).</li> <li>17. Develop access and benefit-sharing arrangements with indigenous and local communities areas (NBSAP, 2015).</li> <li>18.</li> </ol>	<ol style="list-style-type: none"> <li>1. DO 2 (but not targeting critical biodiversity areas)</li> <li>2. DO 2 (but not targeting critical biodiversity areas)</li> <li>3. Not addressing</li> <li>4. EMOS is supporting updating of the National Biodiversity Databank (but not specifically addressing biodiversity inventories)</li> <li>5. Not addressing</li> <li>6. Not addressing</li> <li>7. DO 1 (anticipated, but not currently addressing)</li> <li>8. FTF activities are currently supporting this; DO 1 and 3</li> <li>9. Biodiversity Program is currently addressing this in select areas</li> <li>10. DO 1 (but not explicitly addressed)</li> <li>11. DO 1 (but not explicitly addressed)</li> <li>12. DO 1 (but wetlands not explicitly addressed)</li> <li>13. EMOS is currently addressing valuation with GOU and DLGs; DO 1</li> <li>14. DO 1 (but not explicitly addressed)</li> <li>15. DO 1 (but not explicitly addressed)</li> <li>16. DO 1 (but not explicitly addressed)</li> <li>17. DO 1 (but not explicitly addressing PA/ecosystem services benefit sharing)</li> </ol>

Actions needed	Extent to which USAID is addressing and/or plans to address the actions needed
<p><b>Transboundary threats</b></p> <ol style="list-style-type: none"> <li>1. Establish cross-border wildlife monitoring programs, such as elephant collaring.</li> <li>2. Arrange for and hold regular meetings to share information and allow for joint planning at national and regional level with key law enforcement agencies (police, customs, army, etc.). The Greater Virunga Transboundary Collaboration (GVTC) (DRC, Rwanda and Uganda); lessons learned can be replicated in other locations with transboundary resources.</li> <li>3. Undertake joint law enforcement operations at border points and across borders based on GVTC experiences.</li> <li>4. Work within existing regional networks and law enforcement organizations to build capacity of countries to combat wildlife trafficking and other crimes and to support cross-border investigations and law enforcement. (Regional agencies, such as L ATF, which have led investigations leading to arrests of ivory smugglers (<a href="http://lusakaagreement.org/">http://lusakaagreement.org/</a>) would be one of the agencies to work with. However, only seven African countries are members, and countries like DRC, one of the key sources of wildlife trafficking, is not a member.)</li> <li>5. Negotiate and sign a MoU/declarations to enhance cooperation and joint action in addressing forestry and wildlife crime within the EAC and DRC,</li> <li>6. Under the EAC protocols, develop and prepare a regional law enforcement strategy in line with the International Consortium on Combating Wildlife Crime, illegal logging, and other natural resources-related illegal activities.</li> </ol>	<ol style="list-style-type: none"> <li>1. Not addressing</li> <li>2. DO 1 (planned but not currently addressing)</li> <li>3. DO 1 (but not currently addressing)</li> <li>4. DO 1 (planned but not currently addressing)</li> <li>5. Not addressing</li> <li>6. Not addressing at this time</li> </ol>
<p><b>Human-induced wildfire</b></p> <ol style="list-style-type: none"> <li>1. Put in place fire communication and early warning systems.</li> <li>2. Improve coordination and capacity of agencies involved in enforcement of fire regulations.</li> <li>3. Formulate and implement local policies and ordinances to reduce human-induced fires in areas of important biodiversity.</li> </ol>	<ol style="list-style-type: none"> <li>1. DO 3 (early warning and response, but not explicitly addressing fire)</li> <li>2. DO 1 (but not explicitly addressing fire)</li> <li>3. DO 1 (but not explicitly addressing fire)</li> </ol>
<p><b>Modern agricultural practices</b></p> <ol style="list-style-type: none"> <li>1. Formulate and implement land use plans that balance conservation, agriculture and other livelihoods.</li> <li>2. Promote off-farm industries and employment opportunities.</li> <li>3. Increase the flow of benefits including payment for environmental services for private forest owners to discourage conversion to cropland (NBSAP, 2015)</li> <li>4. Promote agricultural practices that minimize the negative impacts of agricultural production on biodiversity and ecosystem functioning (NBSAP, 2015).</li> <li>5. Support local communities to diversify their livelihoods through biodiversity-friendly enterprises, which eases pressure on the resource base (NBSAP, 2015).</li> </ol>	<ol style="list-style-type: none"> <li>1. Biodiversity Program is currently supporting this; DO 1</li> <li>2. FTF activities are currently supporting this; DO 1, DO 2 and DO 3</li> <li>3. DO 1 (but not a specific focus on PES)</li> <li>4. DO 3 (but not a specific focus on minimizing biodiversity/ecosystem impacts)</li> <li>5. Biodiversity Program is currently supporting this; DO 3</li> </ol>

## 8. OPPORTUNITIES FOR USAID/UGANDA

### 8.1 BRIEF OVERVIEW OF USAID/UGANDA STRATEGIC APPROACH AND PRIORITIES

The five-year goal of USAID/Uganda's CDCS (CDCS 2.0) is *Uganda's systems are accelerating inclusive education, health, and economic outcomes*. The major core challenges to sustainable development in Uganda are a population growth rate much higher than existing national economic, governance, and social systems can absorb; low household and community resilience; and high rates of poverty. The expected results of USAID/Uganda's CDCS after five years include the beginning of a sustained shift toward slower population growth, enhanced resilience of households and communities, and strengthened and more effective economic, social, and governance systems.

USAID/Uganda CDCS 2.0 Results Framework proposes three Development Objectives (DOs) that are closely interlinked and interdependent, working together to reach the five-year and 25-year CDCS 2.0 goals. (The 25-year goal is *Ugandan-led inclusive and sustainable development*.) The three DOs involve integrated, mutually reinforcing approaches to addressing Uganda's core development challenges and their drivers: weak economic, governance, and social-service systems; rapid population growth and the youth bulge; and low community and household resiliency.

The DOs and IRs in USAID/Uganda's CDCS 2.0 Results Framework are:

**DO 1: Key systems more accountable and responsive to Uganda's development needs.** Under DO 1, the following IRs will be achieved:

- Citizens actively participate in development
- Key elements of the systems strengthened
- The enabling environment that supports functional systems improved
- Transformative leadership developed

**DO 2: Demographic drivers affected to contribute to long-term trend shifts.** Under DO 2, the following IRs will be achieved:

- Adoption of healthy reproductive behaviors and practices increased
- Child well-being improved
- Girls' education improved (retention and literacy)
- Increased youth economic productivity

**DO 3: Community and household resilience in select areas and target populations increased.** Under DO 3, the following IRs will be achieved:

- Enhanced prevention and treatment of HIV, malaria, and other epidemics among the most vulnerable
- Community and household assets increased and diversified
- Capacity to manage risk increased
- Key drivers of vulnerability as defined by beneficiaries addressed

## 8.2 RECOMMENDATIONS BASED ON ACTIONS NECESSARY TO CONSERVE BIODIVERSITY, TROPICAL FORESTS, AND THE ENVIRONMENT

### PRIORITIZATION PROCESS

The ETOA Team prioritized the recommendations below in order of importance, from most important for biodiversity conservation to least important. The recommendations address the “actions needed to conserve biodiversity and forests” in **Section 7** and the extent to which USAID is addressing the necessary actions (**Section 7.2**). The higher priority the threat and its underlying causes, the higher priority of the “action needed,” and the higher priority that action needed takes in the recommendations. In addition, if an action needed appears several times in **Table 10** (i.e., it addresses several threats and underlying causes), it has a higher priority in the recommendations.

Only actions needed from **Table 10** that are in USAID’s manageable interest, as defined by CDCS 2.0, and that are within USAID’s comparative advantage are included as recommendations. To build on synergies and minimize overlap, in developing the recommendations to USAID, the ETOA Team also took into account activities that other stakeholders in the ENR sector are implementing (**Annex H**). In some cases, two or more actions needed from **Table 10** are integrated into a single recommendation.

The recommendations below are specifically linked to **Section 7.1** (Actions Necessary). **Section 8.3** and **Annex B** contain additional opportunities for USAID that are specifically related to mitigating impacts at strategic level (FAA 117) and strengthening ENR cross-sectoral links. Many of the recommendations below and in the FAA 117 Assessment overlap.

**Recommendations 1 through 9 below are considered critical** for biodiversity conservation.

### RECOMMENDATIONS

1. Since Uganda’s high population growth rate is the main underlying cause of threats to biodiversity, **under DO 2, USAID should implement family planning programs in underserved areas surrounding PAs and other critical and threatened natural ecosystems.**
2. **Under DO 3, USAID should support vulnerable communities adjacent to PAs to establish rural livelihood activities that combine climate change resilience and alternatives to subsistence agriculture.** This would help minimize encroachment into PAs and conversion of land to agriculture, as well as unsustainable and illegal uses of PA resources. Support could be provided for activities in agriculture (eco-agriculture/climate-smart agriculture), forestry, livestock rearing, enterprises that develop alternative sources to bushmeat protein, and alternative energy equipment sales and repairs especially targeting youth and vulnerable households (DO 2). A significant focus should be on promotion of value addition schemes for agricultural production. This recommendation could be integrated with Recommendations 3, 4, 5, and 6 below.

Target areas: communities around LMNP, QECA, MFCA, and KVNP.

3. **Under DO 1 and DO 3, USAID should promote the establishment and operation of conservancies and community wildlife areas/local reserves, game ranching, and private reserves to provide alternative livelihood options in areas adjacent to PAs and other areas with important biodiversity.** (**Annex H** describes conservation efforts and includes information on these schemes, including lessons learned.) Employment for youth should be integrated into these models through DO 2.

Possible income-generating activities at conservancies are game ranching (Ziwa Rhino and Wildlife Ranch in partnership with Rhino Fund and UWA have had relatively successful programs breeding rhinos and in management of livestock and wildlife.); small enterprise development, such as chili farming (including



processing), honey production, and other value-added enterprises, especially ones that would promote the conservancy/landscape/conservation; community-based sport-hunting (based on lessons learned and scientific knowledge); and eco-tourism initiatives combining hiking, bird watching, biking, wildlife watching/photography, and cultural/archeological tours.

Target areas: the Uganda Biodiversity Program efforts around Karenga CWMA and Rurambira Conservancy near Lake Mburo National Park should be scaled up in new areas, such as Amuru and Aswa Lolim north of MFNP and in CWAs in South Karamoja. These areas are wildlife corridors and dispersal areas with potential for wildlife management schemes that can be organized around conservancies.

**4. Under DO 3, support the conservation and management of key wildlife corridors, where considerable biodiversity exists outside the PA system:**

- In the Karamoja region: Scale up and replicate land use planning based on lessons learned in Karenga CWA for management of CWAs in Karamoja region, where sizable and critical CWAs (see **Annex G**) connect PAs. In partnership with the private sector, the community and DLGs, implement pilot programs in support of land use plans.
- In the Albertine Rift region: Payment for Environmental Services (PES), particularly through REDD+ payments, are the most important potential source of funds for management of the identified corridors. In support of these efforts, USAID should consider engaging with the private sector (oil and gas companies, mining companies, etc.), communities, CBOs, and governments in the northern Albertine Rift in offsetting their negative impacts through PES or similar private-public partnerships (see **Annex G**).

Target corridor: Kyambura-Kashohi Kitomi corridor between QENP and Kashohi Kitomi FR.

**5. Under DO 3, USAID should support collaborative management of forests, wetlands, and wildlife conservation areas to encourage sustainable management. (Annex G includes information on these schemes.) Employment for youth should be integrated through DO 2.**

Target areas: CFM Groups around Kalinzu CFR and MFCA; Budongo forest (Budongo is one of the most diverse forests in the country with many CFM groups that have not been operationalized.).

**6. Under DO 3, USAID should promote alternative energy, as well as charcoal and fire wood production, as a sustainable enterprise.** This would involve supporting the use of energy-efficient technologies, which could integrate DO 2, increasing employment opportunities for youth. This recommendation should involve:

- publishing and implementing the FSSD Manual for promoting energy crops/trees for charcoal, which should include technical guidance on appropriate charcoal production tree species, charcoal kilns, and conversion rates;
- establishing a buy-in by forestry and conservation agencies to recognize charcoal making as an enterprise that could promote conservation;
- promoting start-up enterprises that produce woody biomass to sustain charcoal production; and
- supporting the review and revision of forestry and energy policies regarding charcoal production and trade as an economic enterprise. This should include licensing procedures and fees; work with beneficiary groups to enhance monitoring and tracking to check illegal production and trade to avoid market distortions; and identifying and working with local champions and communities that are already engaged in the charcoal production and trade.

**7. Under DO 1, USAID should establish an EIA capacity-strengthening program for sector lead agencies, including local governments, NEMA, districts, and national EIA practitioners on planning, developing mitigation measures, monitoring, environmental management of different types of infrastructure development, and environmental audits (for developments inside and**

**outside of PAs).** This recommendation would involve on-the-job capacity strengthening, actually conducting and reviewing EIAs, and monitoring mitigation measures, as well as other types of capacity strengthening.

Priority institutions to target are those in the frontline of biodiversity conservation such as UWA, NFA, Fisheries, Water, Energy, and Wetlands, especially the field-based officials, as well as DLGs.

**8. Under DO 1, USAID should support the GOU’s efforts to combat illegal trafficking of natural resources, including wildlife and timber by providing support to:**

- strengthen law enforcement capacity of relevant institutions, especially NFA and UWA, to undertake patrols to detect and control illegal activities (This could involve support for SMART (Spatial Monitoring and Reporting Tool) inside and outside of PAs, ensuring that the entire SMART approach is integrated—not only data collection, but adaptive management at PA and national levels.);
- establish and equip outposts in key and strategic areas;
- recruit staff to meet planned staffing levels;
- strengthen capacity of the agencies to regulate off-takes and effectively monitor legal trade for sustainable management of the resources;
- strengthen the Environment Protection Unit;
- strengthen technical capacity and provide equipment for wildlife crime detection, legal procedures, investigations, and prosecution for relevant law enforcement staff including police (UWA has established an intelligence and investigation unit that needs capacity building and support for implementation of the National Ivory/Elephant Action Plan.);
- strengthen capacity of DFSs to improve enforcement of regulations governing trade in timber from privately owned land;
- develop a coordination mechanism to foster cooperation and information sharing among PA agencies with all relevant law enforcement agencies and stakeholders at local, national, regional, and international level (Lusaka Agreement, Interpol, CITES, army, etc.) to stop illegal timber, wildlife trade, and trafficking; and
- strengthen Uganda’s capacity to support cross-border investigations and law enforcement, working within existing regional networks and law enforcement organizations.

**9. Under DO 1, USAID should strengthen the capacity of UWA’s Human-Wildlife Conflict Unit, including providing training and equipment for PAs to manage problem animals (crocodile capture and relocation, response action towards rogue elephants, and stray animals). Support could also be provided in:**

- maintenance of barriers where they are effective—buffalo wall, live fence barriers along boundaries (training and equipment);
- support for developing and implementing National Guidelines for management of HWC; and
- continuing to explore and pilot methods of control—scare, and repellent actions (e.g., pepper spray, animal dung)—and establishment of buffer areas with crops that are non-palatable to target wildlife species.

To complement UWA efforts in HWC management and build capacity for DLGs to manage problem animals, USAID could promote the establishment of wildlife scouts to engage in HWC and wildlife-related management programs (e.g., Human-Gorilla (HuGo) scheme for problem mountain gorillas, scouts in Karenga CWMA); this would integrate DO 2, expanded economic opportunities for youth.

Under DO 1, USAID should strengthen the PA revenue-sharing system, building greater transparency and citizen input into the process. This would help minimize conflicts between communities and PAs and would help motivate communities adjacent to PAs to protect wildlife.

10. **Under DO 1 and DO 3, USAID should consider supporting the development of tools and technologies that can reduce risks to biodiversity from climate change**, such as studies on climate change impacts on biodiversity (including wetlands) and mitigation measures, as well as UWA, NFA, and Wetlands Department climate change monitoring programs on ecosystems in and around PAs to better understand and respond to the impacts.
11. **Under DO 1, USAID should consider supporting the development of a coordination mechanism for government institutions involved in biodiversity conservation and environment/natural resources management to help harmonize activities and to improve coordination and collaboration.** This would help address conflicting mandates and overlaps in natural resources institutions' activities and would help natural resources agencies work more synergistically; they would become stronger advocates for biodiversity conservation.
12. **Under DO 1, USAID should consider supporting local communities to register their customary land, especially land with natural ecosystems, and register land under CFM Groups, as well as supporting demarcation of wetlands to help address encroachment.**
  - a) Forest biodiversity in CFRs and LFRs continues to be under threat, in part because the boundaries of the reserves have not been marked for many years and no visible signs delineate reserves from private land. No known interventions exist to secure boundaries of the 5,000 ha of LFRs, yet many have been encroached on and are under threat of conversion to other land uses.

Target areas: USAID should consider supporting NFA to demarcate boundaries of selected LFRs in the Kidepo landscape to support the conservation of the park and community wildlife area of Karenga. Boundaries of 506 CFRs need to be secured and updated on Uganda's cadastral map; this is about 11,000 km of CFR boundaries that need to be delineated and marked.

This recommendation could be integrated into Recommendation 5.
  - b) Wetland demarcation and inventories are needed for planning and conservation purposes, including for proposed gazettement and to discourage unplanned settlements and agricultural expansion. Inventories would also determine value of resources, potential resources that could be commercialized, important cultural resources, and so forth. (All the district wetland inventories are due for updates, necessary for use in planning, decision making, and development of district wetland action plans and management plans, which include funding requests.) This effort could also be integrated with alternative livelihoods development for communities that live adjacent to wetlands (as part of implementation of target Wetlands Management Plans and operationalizing/implementing collaborative management of wetlands).

This could be integrated into Recommendation 2.
13. **Under DO 1, USAID should consider supporting the development of a system of valuation of natural ecosystems including for all PAs**, thereby integrating ecosystem values into national planning and accounting systems, and generate comprehensive and up-to-date data on economic values of ENR and ecosystem services and contribution to the economy.
14. **Under DO 1 (support to DO 2), USAID should conduct an evaluation of healthcare waste (including bed nets) and expired pharmaceutical handling and disposal in USAID projects.** Little information is currently available on effectiveness of handling (including storing, collecting, and disposing) in USAID projects, and considering the CDCS includes a significant focus on healthcare (DO 2), an evaluation and recommendations for best practices could have significant positive effects for

follow-on activities in this technical area. Findings of an evaluation could be built on by DO 1. This recommendation is also included as a mitigation measure in **Section 8.3** and **Annex B**.

15. **Under DO 1, USAID should consider supporting the establishment of environmental standards for industrial discharges, including hazardous wastes, into ecosystems.** This would expand the development of standards (under USAID/EMOS) that are now addressing only oil and gas discharges to a wider range (discharges from mining and other polluting industries).
16. **Under DO 2, USAID should consider focusing on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems.** When girls are educated, they are more likely to delay marriage and childbirth and break the cycle of poverty (World Bank, Girls' Education website).
17. **Under DO 1, USAID should consider establishing an inter-sectoral coordination mechanism (Ministry of Health, MAAIF, and conservation agencies) for monitoring, surveillance, and management of zoonotic diseases.**
18. **Under DO 3, USAID should consider supporting invasive plant management and control by:**
  - supporting UWA to develop and implement an invasive species management action plan in partnership with relevant research institutions;
  - carrying out research on appropriate ways of controlling invasives;
  - supporting studies on climate change contribution to the spread of invasives and measures to address impacts;
  - providing support for physical, biological, and chemical environmentally friendly methods to removal invasive species, based on approved EIAs; and
  - providing support to community programs in partnership with DLGs, especially among pastoral communities, for removal of invasive species (e.g., *Lantana camara* from pasturelands, particularly for QENP and LMNP, where livestock are reported to be a source of dispersal of invasive species).
19. **Under DO 3 USAID should consider supporting a fire communication and early warning system,** which would improve coordination and capacity of agencies involved in enforcement of fire regulations and formulate and implement local policies and ordinances to reduce human-induced fires in areas of important biodiversity.

### **8.3 RECOMMENDATIONS BASED ON THE FAA I I7 ANALYSIS (ANNEX B)**

See **Annex B** for the full analysis.

#### ***DO 1: Key systems more accountable and responsive to Uganda's development needs***

##### **Citizens actively participate in development**

Opportunities to address ENR concerns include the following:

- Strengthen ENR advocacy roles of NGOs, CSOs, and communities.
- Improve citizen participation in the EIA process.
- Strengthen EIA practitioner capacity to clearly present impacts and practical mitigation measures.
- Raise awareness of citizens of the importance of the ENR sector and the possibilities to balance development with conservation.
- Raise awareness of and disseminate information on biodiversity/natural resources-based enterprises that have the potential to generate income while conserving biodiversity. Provide assistance to develop natural resources-based enterprises, such as links to markets, support along the value chain.

- Develop and implement Payment for Environmental Services (PES).
- Develop transparent access and benefit-sharing arrangements between PAs and communities.
- Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves. Identify and support implementation of income generation activities that conservancies and other schemes could implement.
- Support development of land use plans in areas adjacent to PAs and support implementation of target activities that have the potential to benefit biodiversity conservation while generating income.

### **Key elements of the systems strengthened**

Opportunities to address ENR concerns are as follows:

- Obtain, compile, and provide useful environmental data to support decision making on development issues. Some of the specific data needs in the ENR sector are: value of natural resources; noise, air, and water quality standards with a focus on development projects in protected areas; inventories of wildlife, forests, and wetlands for planning and conservation purposes; and environmental monitoring methods for energy sector and other infrastructure development projects.
- Include valuation of ENR in the national planning and accounting systems to support increased budgets for ENR agencies.
- Using a competitiveness model, identify and attract environmentally “friendly” sectors and enterprises; identify public-private partnerships to support them; and provide training (focus on youth, vulnerable populations) in biodiversity/natural resources-based enterprise development.
- Provide training for NEMA, key line agencies, and DLG staff in environmental impact assessment, mitigation, and monitoring; and use EIA model to demonstrate to GOU the utility of EIA and how it promotes wise/sustainable development; involve the public in EIA development.
- Expand SMART monitoring system to additional PAs.
- Support the registration of community forests on communal land to ensure their sustainable management.
- Support local communities to register their customary land, especially those with natural ecosystems.
- Improve coordination and capacity of agencies involved in enforcement of fire regulations.

### **The enabling environment that supports functional systems improved**

Opportunities to address ENR concerns include the following:

- Put in place a coordination mechanism for biodiversity and ENR-related agencies to collaborate and harmonize activities.
- Strengthen implementation of key policies and laws, such as the National Range Land Policy.
- Support finalization of the Wetlands Bill to strengthen protection of wetlands.
- Support finalization of the Land Use and Land Use Planning Policy.
- Support the establishment of taxation reforms to reduce taxes on alternative clean energy sources, such as electricity, cooking gas, and solar equipment, to promote conservation of wood fuel sources.
- Support mainstreaming of climate change and ENR into national sectoral and Local Government planning as part of implementation of NDP II.

### **Transformative leadership developed**

Opportunities to address ENR are as follows:



- Formulate and implement local policies and ordinances to reduce human induced fires in areas of important biodiversity.
- Strengthen ENR and advocacy capacity of leaders who can advocate for balancing development with conservation.
- Identify and develop champions (individual and institutions) that can catalyze support for biodiversity and forest conservation and improved natural resource management. These champions need to be at various levels of government and civil society, and able to influence actions of others.
- Identify local solutions that could lead to biodiversity conservation; for example, totems (an animal, plant, or natural object or representation of an object that serves as the emblem of a clan or family among a tribal or traditional people; totems are protected and respected) and other traditional means for conservation.

**DO 2: Demographic drivers shifted/affected/positively influenced to contribute to long-term trend shifts**

**Adoption of reproductive health behaviors and practices increased**

An opportunity to address environmental/natural resources concerns is:

- Provide access to family planning programs in under-served areas surrounding PAs and other critical and threatened natural ecosystems.

**Child well-being improved**

The disposal of HCW (healthcare waste), including expired pharmaceuticals, is a potential environmental threat.

- Mitigation will be needed to ensure that measures are put in place to handle, including dispose of, HCW in an environmentally sound manner. Specific handling, including collection and disposal practices, should be integrated into each activity. Alternatively, a separate mechanism may be used that would be responsible for this aspect for all or most USAID activities that involve HCW. A mid-term evaluation should be conducted to evaluate the success and shortcomings of HCW management—under whichever mechanism USAID chooses to use.

In addition, if DO 2 includes indoor residual spraying (IRS) for control of mosquitoes, handling of pesticides (use, storage, transport, mixing, disposal) could pose a threat to ENR. If USAID will distribute insecticide-treated bed nets, disposal (including reuse/recycling) will need to be integrated into the activity.

**Girls' education improved (retention and literacy)**

An opportunity to address ENR concerns is:

- Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems. When girls are educated, they are more likely to delay marriage and childbirth and break the cycle of poverty (World Bank, Girls' Education website).

**Youth economic productivity increased**

Opportunities to address ENR concerns are:

- Create employment opportunities in the ENR sector, such as with Collaborative Forest Management (CFM) Group, Wildlife Management Area, and conservancy enterprises; sustainable/organic agriculture, sustainable forestry and livestock, and alternative energy enterprises and energy efficient cookstove businesses. Employment opportunities outside the ENR sector should also be promoted with a focus on opportunities that are not environmentally damaging. For example, skills development and employment opportunities could be supported in a range of technology areas (call centers, computer programming, computer repair, mobile banking, and other mobile technologies);

vocational skills (mechanical, carpentry, and other trades); and value addition for on and off-farm products, as well as marketing and business skills.

### **DO 3: Community and household resilience in target populations increased**

#### **Enhanced prevention and treatment of HIV, malaria, and other epidemics among the most vulnerable**

Potential environmental threats are from the disposal of HCW, including expired pharmaceuticals, from use of pesticides for malaria interventions, and from use of insecticide-treated bednets.

- Mitigation will be needed to ensure that measures are put in place to handle, including dispose of, HCW in an environmentally sound manner. Specific handling, including collection and disposal practices, should be integrated into each activity. As above (DO 2), a separate mechanism may be used that would be responsible for this aspect for all or most USAID activities that involve HCW. A mid-term evaluation should be conducted to evaluate the success and shortcomings of HCW management—under whichever mechanism USAID chooses to use.
- Mitigation is also needed to ensure environmentally sound handling (including use, storage, transport, and disposal) of pesticides for indoor residual spraying. The governing Pesticide Evaluation Report-Safe Use Action Plan should be reviewed by all implementing partners and updated if needed, based on the addition of any new activities, new geographic locations, new pesticides, and new implementing partners.
- Mitigation is also needed to minimize impacts of the use of mosquito bed nets. Safe methods of re-use and safe disposal should be promoted. Use as fishing nets should be discouraged. As a mitigation measure, USAID should consider supporting the development of guidelines that can be adapted as community bylaws and promoted.

In addition, achievement of this IR could be placed at risk if potential climate change impacts to infrastructure necessary for delivery of health commodities are not considered. USAID should consider conducting climate change vulnerability assessments in geographic areas targeted under this IR.

#### **Community and household assets increased and diversified**

Opportunities to address ENR concerns include the following:

- Promote diversified livelihoods that are environmentally sound and that contribute to biodiversity conservation and environmental protection, such as natural-resources based enterprises (shea, beekeeping/honey production, medicinal plants, craft making, value-addition).
- Develop and support off-farm opportunities including value addition enterprises, as well as enterprises unrelated to agriculture—technology-related, vocational, and professional.
- Develop transparent access and benefit-sharing arrangements with indigenous and local communities in areas adjacent to PAs and other fragile ecosystems.
- Develop PES schemes (focus on wetland and water catchment services).
- Support formation of conservancies and CFM groups and associated enterprises such as game ranching and ecotourism and subsidiary enterprises.
- Support conservation agriculture/climate-smart agriculture (eco-agriculture) to improve agricultural practices.
- Establish climate change resilience programs in vulnerable communities around PAs.
- Promote alternative energy, charcoal, and firewood production as a sustainable enterprise.
- Develop Community Action Plans for biodiversity conservation in strategic areas.
- Formulate and implement land use plans that balance conservation and agriculture.

- Integrate climate change and ENR into development and sectoral plans at national and district levels and provide funds for implementation.

### **Capacity to manage risk increased**

Opportunities to address ENR concerns are as follows:

- Prepare land use plans that balance conservation and agriculture and implement target land use plan projects.
- Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.
- Establish climate change resilience programs in vulnerable communities around PAs that target all production sectors to minimize poverty and food insecurity that lead to migration/encroachment to fragile ecosystems.
- Integrate climate change into development and sectoral plans at national and district levels and provide funds for implementation.
- Promote alternative energy, charcoal, and firewood production as a sustainable enterprise.
- Strengthen disaster risk reduction programs on zoonotics and emerging pandemics both in humans and wildlife.
- Develop onsite laboratories and facilities for rapid diagnosis and response in high-risk areas.
- Support local communities to diversify their livelihoods through biodiversity-friendly enterprises, which eases pressure on the resource base; promote off-farm industries and employment opportunities.
- Put in place fire communication and early warning systems.

### **Key drivers of vulnerability as defined by beneficiaries addressed**

USAID should incorporate measures to ensure that increasing access to food/addressing key drivers of vulnerability will not result in further encroachment and agricultural conversion. The opportunities to address ENR concerns can, in part, address this threat; however, ongoing monitoring and adaptive management of interventions may be needed.

Opportunities to address ENR concerns include the following:

- Prepare land use plans that balance conservation and agriculture and implement target LUP projects.
- Promote conservation agriculture/climate-smart agriculture (eco-agriculture) to improve agricultural practices; promote value addition and off-farm opportunities.
- Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.
- Establish climate change resilience programs in vulnerable communities around PAs.
- Integrate climate change into development and sectoral plans at national and district levels and provide funds for implementation.
- Promote alternative energy, charcoal, and firewood production as a sustainable enterprise.
- Develop Community Action Plans for biodiversity conservation in strategic areas.
- Support local communities to diversify their livelihoods through biodiversity-friendly enterprises, which eases pressure on the resource base; promote off-farm industries and employment opportunities.

## 9. REFERENCES

- Adokonyero, G.G.O. 2005. Forest Harvesting Case Study No. 22: Pit-sawn Timber Production in Natural Forests of Uganda. FAO, Rome.
- African Wildlife Foundation. September 2014. Biodiversity and Economic Growth through Ecotourism. Revised Application to USAID/Uganda.
- Ahebwa, W. M., van der Duim, R., and Sandbrook, C. 2012. Tourism Revenue Sharing Policy at Bwindi Impenetrable National Park, Uganda: a policy arrangements approach. *Journal of Sustainable Tourism*, 20(3), 377-394.
- Aine-omucunguzi, A., Kagoro-Rugunda, G. and Byarugaba, D. 2009. Utilization of Forest Plant Resources by the Local People around Kalinzu Forest Reserve, South-Western Uganda. *African Journal of Ecology*, 2, 819–821.
- Bolwig, S., Pomeroy, D., Tushabe, H., and Mushabe, D. 2006. Crops, Trees, and Birds: biodiversity change under agricultural intensification in Uganda's farmed landscapes. *Geografisk Tidsskrift-Danish Journal of Geography*, 106(2), 115-130.
- Bush, G., Nampindo, S., Aguti, C., and Plumpre, A. 2004. The Value of Uganda's Forests: A livelihoods and ecosystems approach. Wildlife Conservation Society, Kampala, Uganda.
- Byenkya, G. S., Gumisiriza, G., and Kasigwa, H. 2013. Evaluation of Control Strategies for *Cymbopogon nardus* in Grazing Areas of Uganda. *Journal of Agricultural Science and Technology*, B, 3(9), 656-660.
- Carrere, R. 2013. Oil palm in Africa: past, present and future scenarios. World Rainforest Movement.
- Cottray, O., Miles, L. and Newton, A. 2006. Non-timber forest products in Uganda. Spatial tools supporting sustainable development. UNEP-WCMC Biodiversity Series 18.
- CRED. 2014. Civic Response on Environment and Development. Land Rights Abuses in the Oil-Rich Albertine Graben in Uganda.
- CRED. 2015. Civic Response on Environment and Development. “Up Against Giants”. Oil-Influenced Land Injustices in the Albertine Graben in Uganda.
- Eilu, G., Obua, J., Tumuhairwe, J. K., and Nkwine, C. 2003. Traditional Farming and Plant Species Diversity in Agricultural Landscapes of South-Western Uganda. *Agriculture, Ecosystems & Environment*, 99(1), 125-134.
- Emerton, L. and Muramira, E. 1999. Uganda Biodiversity Economic Assessment. The World Conservation Union (IUCN). Nairobi.
- Environmental Research Journal. 2011. Article. Environmental Research Journal 5(2). <http://www.medwelljournals.com/abstract/?doi=erj.2011.87.92>.
- FAO. 2010. The Food and Agriculture Organisation of the United Nations. Global Forest Resources Assessment 2010. Main report. Italy, Rome.
- FAO. 2014. The Food and Agricultural Organisation of the United Nations. The State of World Fisheries and Aquaculture: Opportunities and Challenges. Rome, Italy.
- Fitzherbert, E. B., Struebig, M. J., Morel, A., Danielsen, F., Brühl, C. A., Donald, P. F., and Phalan, B. 2008. How Will Oil Palm Expansion Affect Biodiversity? *Trends in Ecology & Evolution*, 23(10), 538-545.

- Frison, E. A., Cherfas, J., and Hodgkin, T. 2011. Agricultural Biodiversity is Essential for a Sustainable Improvement in Food and Nutrition Security. *Sustainability*, 3(1), 238-253.
- Geist, H.J., and Lambin, E.F. 2002. Proximate Causes and Underlying Driving Forces of Tropical Deforestation: Tropical forests are disappearing as the result of many pressures, both local and regional, acting in various combinations in different geographical locations. *BioScience*, 52(2), 143-150.
- Glenn, C. R. 2006. "Earth's Endangered Creatures" (Online). Accessed 11/12/2015 at <http://earthsendangered.com>.
- Goldberg, T. L., Gillespie, T. R., Rwego, I. B., Estoff, E. L., and Chapman, C. A. 2008. Forest Fragmentation as Cause of Bacterial Transmission Among Nonhuman Primates, Humans, and Livestock, Uganda. *Forest*.
- GoU. 1995. Government of Uganda. The National Environment Act, Chapter 153. Printing and Publishing Corporation, Entebbe.
- GoU. 2003. Government of Uganda. The National Forestry and Tree Planting Act. Uganda Printing and Publishing Corporation, Entebbe.
- GoU. 2006. Government of Uganda. The National Land Use Policy.
- GoU. 2010. Government of Uganda. Office of the Auditor General. Environmental Audit Report on Forestry Activities in Uganda.
- GoU. 2012. Government of Uganda. National Report on Progress on the Implementation of the Rio Commitments on Sustainable Development in Uganda.
- GoU. 2012. Government of Uganda. Office of the Prime Minister. Government Annual Performance Report.
- GoU. 2012. Government of Uganda. The Republic of Uganda Vision 2040. Government of Uganda, Kampala.
- GoU. 2014. Government of Uganda. Public Investment Plan (PIP) FY2014/15 – 2016/17.
- GoU. 2014. Government of Uganda. The National Wildlife Policy.
- Govender, N., Trollope, W.S.W., and Van Wilgen, B.W. 2006. The Effect of Fire Season, Fire Frequency, Rainfall and Management on Fire Intensity in Savanna Vegetation in South Africa. *Journal of Applied Ecology* 43, 748–758.
- Graczyk, T. K., Mudakikwa, A. B., Cranfield, M. R., and Eilenberger, U. 2001. Hyperkeratotic Mange Caused by *Sarcoptes scabiei* (Acariformes: Sarcoptidae) in Juvenile Human-Habituated Mountain Gorillas (*Gorilla gorilla beringei*). *Parasitology research*, 87(12), 1024-1028.
- Greater Virunga Transboundary Collaboration (GVTC). September 2015. Transboundary Collaboration for the Greater Virunga Landscape: History, Achievements, Challenges and Perspective. Powerpoint presentation to the Executive Secretariat.
- Harrison, M. 2013. Establishing profiles and motivations of resource users at Bwindi Impenetrable National Park, Uganda. MSc thesis. Imperial College London.
- Houghton, P.J. 1995. The Role of Plants in Traditional Medicine and Current Therapy. *The Journal of Alternative and Complementary Medicine*, 1(2), 131-143.
- Howard, P.C. 1991. Nature Conservation in Uganda's Tropical Forest Reserves. IUCN, Gland, Switzerland.



- IISD/UNEP. 2005. International Institute for Sustainable Development (IISD) and United Nations Environment Programme (UNEP), Nairobi, Kenya. Connecting Poverty and Ecosystem Services, Focus on Uganda. <http://www.unep.org>
- Jimu, L. 2011. Threats and Conservation Strategies for the African Cherry (*Prunus africana*) in Its Natural Range: A review. *Journal of Ecology and Natural Environment*, 3, 118-130.
- Kabagumya, C. 2001. Resource Utilization in Forest Patches around Kibale National Parks and Impacts of Continued Exploitation by Rural Communities. MSc thesis. Makerere University.
- Kabumbuli, R., and Kiwazi, F. W. 2009. Participatory Planning, Management and Alternative Livelihoods for Poor Wetland-Dependent Communities in Kampala, Uganda. *African Journal of Ecology*, 47(s1), 154-160.
- Kakudidi, E.K. 2004. Cultural and Social Uses of Plants from and around Kibale National Park, Western Uganda. *African Journal of Ecology*, 42(s1), 114-118.
- Kalema, G.R.N.N. 1995. Epidemiology of the Intestinal Parasite Burden of Mountain Gorillas in Bwindi Impenetrable Forest National Park. *British Veterinary Zoological Society Newsletter*, 14, 4-6.
- Kalema-Zikusoka, G., Kock, R. A., and Macfie, E. J. 2002. Impenetrable National Park, Uganda. *The Veterinary Record*, 150, 12-15.
- Kissinger, G., M. Herold, V. 2012. Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policymakers. Lexeme Consulting, Vancouver Canada, August 2012.
- Langdale-Brown, I., Osmaston, H.A. and Wilson, G. 1964. *The Vegetation of Uganda and Its Bearing on Land Use*. Uganda Government Printer.
- Laurence, J., Läderach, P., and van Asten, P., Eds. 2012. Oxfam Uganda. *The Impact of Climate Change on Coffee in Uganda: lessons from a case study*.
- LTS. 2010. *Review of the Forestry Sector in Uganda: Proposals for improving governance and effective management in the forestry sector*. LTS International Ltd, United Kingdom.
- MAAIF. 2008. Ministry of Agriculture, Animal Industry and Fisheries, Uganda. *The National Livestock Census Report 2008*. Entebbe, Uganda.
- MAAIF. 2010. Ministry of Agriculture, Animal Industry and Fisheries, Uganda. *Department of Fisheries Resources Annual Report 2010/2011*. Entebbe, Uganda.
- MAAIF. 2010. Ministry of Agriculture, Animal Industry and Fisheries, Uganda. *Agriculture Sector Development Strategy and Investment Plan: 2010/11-2014/15*.
- MAAIF. 2013. Ministry of Agriculture, Animal Industry and Fisheries, Uganda. *The National Agriculture Policy, 2013*. Uganda.
- Mafabi, P. 2000. The Role of Wetland Policies in the Conservation of Waterbirds: The Case of Uganda. *Ostrich*, 71(1-2), 96-98.
- Maloney, W., and Mendez, J. 2004. *Measuring the Impact of Minimum Wages: Evidence from Latin America. Law and Employment: Lessons from Latin America and the Caribbean* (pp. 109-130). University of Chicago Press.
- Mapesa, M., Kyampaire, O., Begumana, J., Bemigisha, J. 2013. *Extent of Illegal Timber, Charcoal, and Wildlife trade in the Greater Virunga Landscape*. Report prepared for the Wild Wide Fund of Nature, Kampala, Uganda.

- MEMD. 2014. Ministry of Energy and Mineral Development, Uganda. Biomass Energy Strategy.
- Messenger, A.M., Barnes, A.N., Gray, G.C. 2014. Reverse Zoonotic Disease Transmission (Zooanthroponosis): A Systematic Review of Seldom-Documented Human Biological Threats to Animals.
- MFPED. 2008. Ministry of Finance, Planning, and Economic Development, Uganda. National Biotechnology and Biosafety Policy, 2008.
- MFPED. 2014. Ministry of Finance, Planning, and Economic Development, Uganda. Budget Speech. 2014/2015 Fiscal year. Kampala, Uganda.
- MFPED. 2014. Ministry of Finance, Planning, and Economic Development, Uganda. Poverty Status Report, 2014. Structural Change and Poverty Reduction in Uganda.
- Ministry of Energy and Mineral Development. 2008. National Oil and Gas Policy for Uganda.
- Mogaka, H., Okeyo-Owuor, J.B., and Kipkoech, A. 2013. Payment for Environmental Services. Laying the Ground Work. Case Studies from Eastern and Central Africa. ASARECA, Entebbe, Uganda.
- Mugerwa, S., and Zziwa, E. 2014. Drivers of Grassland Ecosystems' Deterioration in Uganda. *Applied Science Reports*, 2(3), 103-111.
- Mugerwa, S., Mpairwe, D., Zziwa, E., Namutebi, S., and Peden, D. 2012. Improving Livestock Water Productivity in Semi-arid Ecosystems: Restoration of Pasture on Degraded Bare Surfaces. *Novus Natural Science Research*, 1, 1-13.
- Muhereza, F. 2006. Decentralizing Natural Resource Management and the Politics of Institutional Resource Management in Uganda's Forest Sub-Sector. *Africa Development*, 31(2), 67-101.
- Mulumba, D. 2011. The Gendered Politics of Firewood in Kiryandongo Refugee Settlement in Uganda. *African Geographical Review*, 30(1), 33-46.
- MWE 2007. Ministry of Water and Environment, Uganda. Environment and Natural Resources Sector Investment Plan.
- MWE. 2010. Ministry of Water and Environment, Uganda. Review of the Forestry Sector in Uganda. Proposal for Improving Governance and Effective Management in the Forestry Sector. LTS International Ltd, Pentlands Science Park, Bush Loan, Penicuik, EH26 0PL, United Kingdom.
- MWE. 2011. Ministry of Water and Environment, Uganda. REDD Readiness Preparation Proposal for Uganda, Forest Sector Support Department, Editor. 2011. Kampala.
- MWE. 2012. Ministry of Water and Environment, Uganda. National Water Resources Assessment Report.
- MWE. 2013. Ministry of Water and Environment, Uganda. Directorate of Environmental Affairs. The National Forest Plan 2011/12 – 2021/22.
- MWE. 2013. Ministry of Water and Environment, Uganda. District Implementation Manual, Revised.
- MWE. 2013. Ministry of Water and Environment, Uganda. Final Programme Document. Preparation of the Joint Water and Environment Sector Support Programme (JWESSP) 2013 – 2018.
- MWE. 2013. Ministry of Water and Environment, Uganda. National Water Resources Assessment.
- MWE. 2015. Ministry of Water and Environment, Uganda. Uganda National Climate Change Policy.
- MWE. 2015. Ministry of Water and Environment, Uganda. Water and Environment Sector Performance Report 2014/15 Financial Year (SPR 2015).

- Nabukenya, I., Lukwago, L., Okot, C., Wamala, J. F., Malimbo, M., Namukose, E. M., and Makumbi, I. 2014. Is Uganda a Hub for Zoonotic Disease Outbreaks? Lessons and Challenges from Ebola, Marburg, Yellow Fever and Anthrax Outbreaks. *International Journal of Infectious Diseases*, 21, 238.
- Nalukenge, I., Antle, J., and Stoorvogel, J. 2009. Assessing the Feasibility of Wetlands Conservation: using payments for ecosystem services in Pallisa, Uganda. *Payment for Environmental Services in Agricultural Landscapes*, 239-253. Springer New York.
- Namaalwa, J., Hofstad, O., and Sankhayan, P. L. 2007. A Dynamic Bio-Economic Model for Analyzing Deforestation and Degradation: an application to woodlands in Uganda. *Forest Policy and Economics*, 9(5), 479-495.
- Namaalwa, J., Hofstad, O., and Sankhayan, P. L. 2009. Achieving Sustainable Charcoal Supply from Woodlands to Urban Consumers in Kampala, Uganda. *International Forestry Review*, 11(1), 64-78.
- Namaalwa, S., Funk, A., Ajie, G. S., and Kaggwa, R. C. 2013. A Characterization of the Drivers, Pressures, Ecosystem Functions and Services of Namatala Wetland, Uganda. *Environmental Science & Policy*, 34, 44-57.
- Nangendo, G., Stein, A., ter Steege, H., and Bongers, F. 2005. Changes in Woody Plant Composition of Three Vegetation Types Exposed to a Similar Fire Regime for Over 46 Years. *Forest Ecology and Management*, 217(2), 351-364.
- Naughton-Treves., L., Kammen, D., and Chapman, C. 2007. Burning Biodiversity: woody biomass use by commercial and subsistence groups in western Uganda's forests. *Biological Conservation*.
- Ndangalasi, H.J., Bitariho, R., and Dovie, D. B. 2007. Harvesting of Non-Timber Forest Products and Implications for Conservation in Two Montane Forests of East Africa. *Biological Conservation*, 134(2), 242-250.
- NEMA, 2012. National Environment Management Authority. National state of environment report for Uganda 2012. Kampala, Uganda.
- NEMA. 2002. National Environment Management Authority, Uganda. National Biodiversity Strategy and Action Plan for Uganda, 2002.
- NEMA. 2007. National Environment Management Authority, Uganda. National State of Environment Report.
- NEMA. 2009. National Environment Management Authority, Uganda. Uganda: Atlas of Our Changing Environment.
- NEMA. 2009. National Environment Management Authority. Strategic Plan 2009/2010-2013/2014.
- NEMA. 2014 (a). National Environment Management Authority. Fifth National Report to the Convention on Biological Diversity.
- NEMA. 2014 (b). National Environment Management Authority. National State of the Environment Report for Uganda, 2012: Harnessing our Environment for Wealth Creation.
- NEMA. 2015. National Environment Management Authority. National Biodiversity Strategy and Action Plan for Uganda, 2015-2025.
- NFA. 2008. National Forestry Authority, Uganda. Strategic Action Plan for the Period 2008 /9 to 2012/13 with Priorities for the First Five Years.
- NFA. 2009. National Forestry Authority, Uganda. National Biomass Study Technical Report, unpublished.

- Nizeyi, J.B., Mwebe, R., Nanteza, A., Cranfield, M.R., Gladys, R.N.N. Kalema, and Graczyk, T.K., 1999. Cryptosporidium sp. and Giardia sp. Infections in Mountain Gorillas (*Gorilla gorilla beringei*) of the Bwindi Impenetrable National Park, Uganda. *The Journal of Parasitology*, 85(6), 1084–1088. <http://doi.org/10.2307/3285672>.
- Nsubuga, F.N.W., Namutebi, E.N., and Nsubuga-Ssenfuma, M. 2014. Water Resources of Uganda: An Assessment and Review. *Journal of Water Resource and Protection*, 6, 1297-1315.
- Obua, J., Agea, J.G., and Ogwal, J.J. 2010. Status of Forests in Uganda. *African Journal of Ecology*, 48(4), 853-859.
- Odokonyero, G. 2005. The Food and Agricultural Organisation of the United Nations. Pitsawn Timber Production in Natural Forests of Uganda: a forest harvesting case-study, No. 22.
- Okwakol, M.J.N., and Sekamatte, M.B. 2007. Soil Macrofauna Research in Ecosystems in Uganda. *African Journal of Ecology*, 45(s2), 2-8.
- Omagor, N. 1999. Swamp Forest Plant Resources in Uganda: Their uses and conservation challenges. *International Tree Crops Journal*, 10(2), 107-120.
- Omeja, P.A., Lwanga, J.S., Obua, J., and Chapman, C.A. 2011. Fire Control as a Simple Means of Promoting Tropical Forest Restoration. *Trop Conservation Science*, 4(3), 287-299.
- Oosterveer P., and Van Vliet, B., 2010. Environmental Systems and Local Actors: decentralizing environmental policy in Uganda. *Environmental Management* 45(2), 284–295.
- Owona, J.C. 2008. Land Degradation and Internally Displaced Person's Camps in Pader District – Northern Uganda. Pader District Local Government.
- Paterson, J.A., and Chapman, L.J. 2009. Fishing Down and Fishing Hard: ecological change in the Nile perch of Lake Nabugabo, Uganda. *Ecology of Freshwater Fish*, 18(3), 380-394.
- Pomeroy, D., and Tushabe, H. 2004. The State of Uganda's Biodiversity 2004. Makerere University, Institute of Environment and Natural Resources/National Biodiversity Data Bank. Assistance from DANIDA-ENRECA.
- PREDICT Consortium. 2014. Reducing Pandemic Risk, Promoting Global Health. One Health Institute, University of California, Davis, December 2014.
- Prinsloo, S., Mulondo, P., Mugiri, G. and Plumtre A.J. 2011. Measuring Responses of Wildlife to Oil Operations in Murchison Falls National Park. *Wildlife Conservation Society and Uganda Wildlife*.
- Rwakaikara-Silver, M.C., Akol, A., Isabirye, B., Nkwiine, C., Isabirye, M., Serani, S., and Majaliwa, J.G.M. 2010. Soil Biodiversity Research in Uganda: gains, consolidation and capacity needs. Second RUFORUM Biennial Regional Conference on Building Capacity for Food Security in Africa, Entebbe, Uganda, 20-24 September 2010. 1367-1370.
- Rwego, I.B., Isabirye-Basuta, G., Gillespie, T.R., and Goldberg, T.L. 2008. Gastrointestinal Bacterial Transmission Among Humans, Mountain Gorillas, and Livestock in Bwindi Impenetrable National Park, Uganda. *Conservation Biology*, 22(6), 1600-1607.
- Shepherd, G., Kazoora, C. and Mueller, D. 2013. Forests, Livelihoods and Poverty Alleviation: The Case of Uganda. FAO, Rome, 72p.
- Srivastava, J., Lambert, J., and Vietmeyer, N. 1996. Medicinal plants: An expanding role in development. World Bank Publications, Vol. 320.

- Stewart, K. M. 2003. The African cherry (*Prunus africana*): Can lessons be learned from an over-exploited medicinal tree? *Journal of Ethnopharmacology*, 89(1), 3-13.
- Stewart, K. M. 2003. The African Cherry (*Prunus africana*): From hoe-handles to the international herb market. *Economic Botany*, 57(4), 559-569.
- Tabuti, J.R.S., Dhillon, S.S., and Lye, K.A. 2003. Firewood Use in Bulamogi County, Uganda: species selection, harvesting and consumption patterns. *Biomass and Bioenergy*, 25(6), 581-596.
- The Arusha Declaration on Regional Conservation and Combating Wildlife/Environmental Crime. November 2014.
- Thrupp, L.A. 2000. Linking Agricultural Biodiversity and Food Security: the valuable role of sustainable agriculture. *International Affairs (Royal Institute of International Affairs 1944-)*, 265-281.
- Tiwari, S. 2008. Plants: A Rich Source of Herbal Medicine. *Journal of Natural Products*, 1, 27-35.
- Tumusiime, D.M., and Vedeld, P. 2012. False Promise or False Premise? Using tourism revenue sharing to promote conservation and poverty reduction in Uganda. *Conservation and Society*, 10(1), 15.
- Turyahabwe, N., Byakagaba, P., and Tumusiime, D.M. 2015. Decentralisation of Forest Management – Is It a Panacea to Challenges in Forest Governance in Uganda?. *Precious Forests - Precious Earth*, Miodrag Zlatic (Ed.). ISBN 978-953-51-2175-6. InTech, DOI 10.5772/61014.
- Turyahabwe, N., Geldenhuys, C. J., Watts, S., and Obua, J. 2007. Local Organisations and Decentralised Forest Management in Uganda: roles, challenges and policy implications. *International Forestry Review*, 9(2), 581-596.
- Turyahabwe, N., Tumusiime, D. M., Kakuru, W., and Barasa, B. 2013. Wetland Use/Cover Changes and Local Perceptions in Uganda. *Sustainable Agriculture Research*, 2(4), 95.
- Twongyirwe, R., Sheil, D., Sandbrook, C.G., and Sandbrook, L.C. 2015. REDD at the Crossroads? The Opportunities and Challenges of REDD for Conservation and Human Welfare in South West Uganda. *International Journal of Environment and Sustainable Development* 14(3), 273–298.
- UBOS. 2002. Uganda Bureau of Statistics. Ministry of Finance, Planning, and Economic Development. Uganda Population Census.
- UBOS. 2008. Uganda Bureau of Statistics. Ministry of Finance, Planning, and Economic Development. *Statistical Abstracts*.
- UBOS. 2009. Uganda Bureau of Statistics. Ministry of Finance, Planning, and Economic Development. Higher Local Government Statistical Abstract, Kibaale District.
- UBOS. 2010. Uganda Bureau of Statistics. Ministry of Finance, Planning, and Economic Development. Statistical Abstract 2010.
- UBOS. 2013. Uganda Bureau of Statistics. Ministry of Finance, Planning, and Economic Development. Statistical Abstract August 2013.
- UBOS. 2014. Uganda Bureau of Statistics. Ministry of Finance, Planning, and Economic Development. National Population and Housing Census, 2014 – Provisional Results.
- UBOS. 2014. Uganda Bureau of Statistics. Ministry of Finance, Planning, and Economic Development. Uganda Statistical Abstract 2014.
- UNCST. ND. UNCST Updates. <http://www.uncst.go.ug/component/content/article/3-featured-story/166-ncsti-plan-201213-201718.html>



- USAID. 2013. ARCC Background Paper (Draft): Uganda Vulnerability Assessment Report.
- USAID/African & Latin American Resilience to Climate Change Project. (Alex B. Muhweezi) An Overview of Climate Change and Biodiversity in Uganda (August 2014).
- UWA. 2011. Uganda Wildlife Authority. Annual Report 2011.
- UWA. 2011. Uganda Wildlife Authority. Ministry of Tourism, Wildlife and Antiquities. Queen Elizabeth National Park General Management Plan, 2011-2021.
- UWA. 2012. Uganda Wildlife Authority. Kidepo National Park General Management Plan, 2012-2022.
- UWA. 2012. Uganda Wildlife Authority. Murchison Falls National Park General Management Plan, 2012-2022.
- Van Seters, A.P. 1997. Forest Based Medicines in Traditional and Cosmopolitan Health Care. Medicinal Plants for Forest Conservation and Health Care, 5-11.
- Villegas, C., Weinberg, R., Levin, E., Hund, K. 2012. Artisanal and Small-scale Mining in Protected Areas and Critical Ecosystems Programme (ASM –PACE). Working Together Towards Responsible Artisanal and Small Scale Mining. A Global Solutions Study. Estelle Levin Limited and WWF.
- von Sarnowski, A. 2004. The Artisanal Fisheries of Lake Albert and the Problem of Overfishing. In Proceedings: Conference on International Agricultural Research for Development. [www.tropentag.de/de/2004/proceedings/node402.html](http://www.tropentag.de/de/2004/proceedings/node402.html).
- WCS, 2015. Wildlife Conservation Society. Proposed List of Nationally Threatened Species for Uganda, Kampala Uganda
- World Bank. Girls' Education. <http://www.worldbank.org/en/topic/education/brief/girls-education>
- WTTC. 2012. World Travel & Tourism Council. Travel & Tourism Economic Impact 2012: Uganda. WTTC, London.
- WWF. 2012. World Wide Fund. Timber Movement and Trade in Eastern Democratic Republic of Congo and Destination Markets in the Region.
- WWF. 2012. World Wildlife Fund. A Report on National Timber Trade and FLEGT Solutions for Uganda. Kampala, Uganda.

# ANNEXES

# ANNEX A: SCOPE OF WORK FOR THE UGANDA ETOA

## SECTION C - STATEMENT OF WORK from Task Order Contract # AID-617-TO-15-00005

### 1. OBJECTIVES

The objectives of this Task Order are twofold:

- 1) To conduct a country-wide assessment of biodiversity and tropical forest conservation needs and related issues for the purposes of complying with Sections 117, 118, and 119 of the Foreign Assistance Act (FAA) of 1961, as amended, and USAID guidance on country strategy development, described in Automated Directives System (ADS) Chapters 201.3.4.1, 201.3.4.2, and 204. This assessment will determine 1) the potential impacts of proposed development activities on the environment and natural resources, 2) the actions necessary to achieve sustainable management of tropical forests and conservation of biological diversity, and 3) the extent to which USAID/Uganda's ongoing and proposed programming meets the needs identified.
- 2) To identify important issues and risks related to environmental conditions and threats that USAID/Uganda must be aware of as it implements its Country Development Cooperation Strategy (CDCS), along with opportunities to integrate environmental considerations into existing or planned Mission activities in key technical sectors.

### 2. BACKGROUND

#### *2.1. Policies Governing Environmental Procedures*

USAID environmental compliance is directed by U.S. policy and law. The FAA of 1961, Section 117, requires that the President take fully into account the impact of foreign assistance programs and projects on the environment and natural resources (Section 117 (c)(1)).

Section 118 states that each country development strategy statement or other country plan prepared by USAID shall include an analysis of (1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests, and (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

Section 119 of the FAA relates to Endangered Species. It states that “the preservation of animal and plant species through the regulation of the hunting and trade in endangered species, through limitations on the pollution of natural ecosystems and through the protection of wildlife habitats should be an important objective of the United States development assistance” (FAA, Sec. 119 (a)). Furthermore it states, “Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of (1) the actions necessary in that country to conserve biological diversity and (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified” (FAA, Sec. 119 (d)).

USAID/Uganda is currently in the process of developing a new, five-year Country Development Cooperation Strategy (CDCS) for 2016 - 2020. To fulfill the mandate described above, and for USAID/Uganda to identify potential threats and opportunities associated with the management of the environment and natural resources, an assessment is needed to inform Mission planning. The purpose of this Task Order is to provide USAID/Uganda with this information and analysis.

The last USAID/Uganda Environmental Threats and Opportunities Assessment (ETOA) was conducted in

2011. Since then, there have been a number of relevant developments in Uganda that require further scrutiny, notably the initiation of oil drilling and associated infrastructure development in the Albertine Rift and the designation of Uganda as among the “Gang of Eight” worst offending countries in the illegal ivory trade. Demand for charcoal, encroachment of agriculture and human settlements onto forested and protected areas and mining continue to degrade the country’s already dwindling forests. Moreover, Uganda’s rapid population growth and related needs to provide food, energy, income and social services to its bulging youth demographic further strain the country’s natural resources and ecosystem services. Accordingly, there is a need both to update the 2011 report and to perform a more focused assessment to address emerging and persistent threats to tropical forests and biodiversity. Moreover, as USAID/Uganda moves toward more integrated development objectives under its new CDCS, the Mission recognizes the need to examine potential opportunities for innovative strategic approaches to address these threats as they relate to major programmatic areas and Presidential priorities.

## ***2.2. USAID/Uganda Program***

USAID/Uganda was one of the first Missions to implement the Agency’s CDCS process, and is now among the first to embark on its second-generation strategy. USAID/Uganda’s new CDCS aims to address major development challenges through integrated approaches that bring different technical sectors together to achieve common objectives. This ETOA will provide critical analysis to inform the elaboration of these multi-dimensional and cross-cutting development objectives, as well as assist in the prioritization and coordination of USAID/Uganda and other donor resources for greatest development impact and sustainability. Notably, it will highlight opportunities to build linkages between natural resource and environmental conservation and priority development themes identified in the CDCS and the Government of Uganda’s Second National Development Plan (NDP II).

## **3. STATEMENT OF WORK**

The Contractor shall perform the following activities:

- A) Informational meetings and information gathering. Prior to traveling to the field, the Contractor is expected to:
  - 1. Hold meetings with biodiversity conservation experts in the USAID Africa Bureau and Bureau for Economic Growth, Education and Environment (E3) who are familiar with Uganda and with the required biodiversity and tropical forestry analyses for strategy development. The purpose of these meetings is to brief these USAID staff on the contracted activities and obtain their input and guidance concerning strategic policies and technical approaches for the assessment of biodiversity and tropical forestry conservation relevant to Uganda. The meetings will also identify relevant sources of background information, as well as key persons to consult regarding the assessment.
  - 2. Gather and become familiar 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 assessment.
  - 3. Meet or speak with key stakeholders or managers at the World Bank, USDA Forest Service, U.S. Department of the Interior, U.S.-based NGOs engaged in biodiversity and tropical forest conservation in Uganda, including the Wildlife Conservation Society, World Wildlife Fund and World Resources Institute. Other organizations involved in biodiversity conservation or relevant regional efforts should also be contacted.
- B) Field-based data collection and analysis. Upon arriving in Uganda, the assessment team will:
  - 1. Meet with USAID/Uganda staff to acquire a solid understanding of ongoing Mission programming

under its current strategy and the goals and objectives of the draft CDCS (2016 – 2020); expectations for the assessment and specific interests of USAID/Uganda, including advice and protocol on approaching USAID partners and host country organizations with respect to this assignment. The Assessment 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 Assessment 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 Development Objective teams and U.S. Department of State offices relevant to the assessment.

2. Hold meetings with donor organizations, NGOs, relevant government agencies, and other organizations that are knowledgeable about biodiversity and tropical forestry conservation, environmental management, and/or are implementing related noteworthy projects, and gather information locally. This may include implementing partners supporting activities related to agriculture, biodiversity conservation, climate change, private sector development, primary education, governance, family planning, malaria and HIV/AIDS, among others.
  3. Conduct at least four priority site visits, which will supplement understanding of USAID/Uganda's programming, or of environmental management issues that arise in interviews and literature, or confirm information in previous assessments. Two of these visits shall include the Ugandan Albertine Rift and priority areas in the northeast. The remaining field visit sites will be determined by the team during the assessment in consultation with USAID, but must include areas in which USAID/Uganda's malaria and agriculture programs are being implemented.
- C) Post-field assessment and analysis. Assess and summarize the needs for natural resource and environmental management, especially biodiversity and tropical forest 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 other priority environmental conservation efforts in Uganda, and potential implications for USAID/Uganda or other donor programming and monitoring which shall define the actions necessary for improved natural resource and environmental management. The report shall include:
1. The current status of Uganda's environment and key natural resources, to include biodiversity, tropical forests and water and soil resources, based on the most current information available. This should include the biophysical condition, productivity, abundance and distribution of these resources and the threats (e.g. degradation, depletion, pollution, etc.) to which they are subjected. For the purposes of this assessment, key natural resources should include forests, woodlands and savannas, wildlife, natural water bodies (lakes, rivers, and wetlands) and soils (fertility and stability) as related to agricultural systems and other forms of land use. The status of petroleum and mineral resources should also be considered in the context of the impacts of their extraction on other natural resources.
  2. Major ecosystem types, highlighting important, unique aspects of the country's biodiversity, including important endemic species and their habitats.
  3. 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).
  4. An overview table and maps of the status and management of the 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, permissible activities, etc.) In addition to this summary, an overview of the major threats and challenges facing protected areas in Uganda, and a brief summary of any recognized economic potential of these areas (including productive assets, ecosystem services, and conservation enterprise opportunities) should be provided.

5. An overview table and maps of the status and management of critical biodiversity and forested areas outside of protected areas in Uganda including: an inventory of these areas by land-cover or land-use type (e.g., wetlands/freshwater sources, major catchment areas, agricultural ecosystems, etc.). The inventory will identify the institution(s) responsible for the protection and/or management of biodiversity and forests in each land-cover/ land-use type. In addition to this summary, an overview of the major threats and challenges facing biodiversity and forests in these areas in Uganda, and a brief summary of any recognized economic potential of such areas (including productive assets, ecosystem services, and conservation enterprise opportunities) should be provided.
6. 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 emphasize species trends, and the relationship 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.
7. Recent, current, and potential primary threats to biodiversity, whether they are ecological (e.g., climate change, fire, invasive species, etc.), related to human use (e.g., deforestation, resource extraction, agriculture, environmental contamination, hunting/ poaching, infrastructure development, etc.), institutional (e.g. failed policy, lack of enforcement, transparency, or accountability, and mismanagement, etc.) or transboundary issues (e.g. illegal wildlife and charcoal trade), as appropriate. Special attention should be given to resource conflict issues, in particular land tenure. These should emerge from a general assessment of national policies and strategies and their effectiveness, issues related to institutional capacity and accountability, trade, private sector growth, demographic change, participation in regional and international treaties, and the role of civil society.
8. Conservation efforts, their scope and effectiveness. This section should include recent, current and planned activities by donor organizations that support forest and biodiversity conservation, identification of multilateral organizations, foundations, NGOs, universities, and other local organizations involved in conservation, and a general description of responsible government agencies. A general assessment of the effectiveness of donor coordination efforts, policies, institutions, capacity, and activities to achieve natural resource and environmental conservation should be included. Priority conservation needs that lack capacity (technical and management), good governance, or donor or local support should be highlighted.
9. An overview of the current legal, regulatory, policy and institutional framework in Uganda related to biodiversity conservation and environmental protection, including Uganda's NDP II, Second National Biodiversity Strategy and Action Plan, Environmental Monitoring Plan for the Albertine Graben and National Ivory Action Plan, and other relevant plans or strategies. This section should include identification of laws related to protection and management of biological resources and endangered species, as well as climate change, renewable energy, and water resource management. It should also point out any differences in laws that require further harmonization. This section should review international treaties signed and ratified by Uganda, as well as those that Uganda needs to sign in order to conserve and manage its biological resources more efficiently. It should also include a discussion of institutional capacity to implement these laws, policies and treaties effectively.



10. 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 lands in or near protected areas, including agricultural producers, petroleum developers and other extractive industries. Consideration of policies promoted by the key relevant governmental ministries should also be included.
11. An assessment of how USAID/Uganda's ongoing programming and proposed CDCS meet the needs for biodiversity and tropical forest conservation. This assessment should look beyond biodiversity and forest conservation-focused activities and review all Mission development objectives to identify areas where USAID/Uganda could contribute to biodiversity and tropical forest conservation, consistent with Mission 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, to include prioritization of areas of intervention (e.g. geographic areas/ protected areas/ species/ threats/ etc.).
12. An initial review of the proposed USAID/Uganda CDCS to identify any potential environmental impacts of planned activities and provide recommendations for each Development Objective so that mitigation of these potential impacts and opportunities to enhance the quality of the natural resource base can be included in the design process. The Assessment Team should discuss all potential environmental impacts within the report and brief the Mission Environmental Officer directly regarding any areas of particular concern.

## **ANNEX B: FAA 117 ANALYSIS OF THE COUNTRY DEVELOPMENT COOPERATION STRATEGY (2016–2020)**

In accordance with the Scope of Work for the ETOA, this Environmental Annex presents the FAA 117 analysis of the potential environmental impacts (threats) of the proposed Country Development Cooperation Strategy (CDCS). The Environmental Annex is an analysis that examines environmental threats and opportunities inherent to the Mission’s strategy and assesses the extent to which the Mission’s strategy incorporates or addresses natural resources and environmental management concerns. This assessment does not substitute for the Initial Environmental Examination (IEE). The Mission is responsible for ensuring that an IEE or a Request for a Categorical Exclusion is conducted for all activities funded by USAID.

According to FAA Section 117 “Environment and Natural Resources,” it is mandatory for operating units to implement their programs with an aim to maintain (and restore) natural resources upon which economic growth depends, and to consider the impact of their activities on the environment. At the USAID strategy level, FAA 117 may be applied to provide an early stage review of potential environmental impacts at strategy level so that mitigation can be included in strategy design. The early stage review also allows crosscutting linkages between the ENR sector and other USAID objectives to be strengthened.

Opportunities and mitigation measures from the FAA 117 analysis below are also included in **Section 8.3** of the main text.

### **1. Brief Summary of the CDCS Results Framework**

The CDCS Results Framework describes USAID/Uganda’s manageable contribution to a Uganda-led inclusive and sustainable development through strengthening systems to ensure the well-being of its citizens. At the same time, it addresses the urgent drivers of population growth that threaten Uganda’s development and unlocks the potential of vulnerable people to exit poverty through targeted interventions to increase communities’ and household’s resilience to shocks and stresses.

The Mission provided only the Draft CDCS Results Framework to the ETOA Team; during preparation of the ETOA, the draft CDCS narrative was not available for review by the ETOA Team. Therefore, the FAA 117 analysis is based on the Draft Results Framework (as of October 26, 2015) and on interviews the ETOA Team conducted with Mission staff to gather more detail about the CDCS.

The FAA 117 analysis is presented based on the Development Objectives (DOs) and Intermediate Results (IRs).

#### **The five year CDCS goal is:**

*Uganda’s systems are improving education, health and economic outcomes.*

The goal will be accomplished through the following three DOs:

#### **DO 1: Key systems more accountable and responsive to Uganda’s development needs**

Under DO 1, the following IRs will be achieved:

- Citizens actively participate in development
- Key elements of the systems strengthened
- The enabling environment that supports functional systems improved
- Transformative leadership developed

## **DO 2: Demographic drivers affected to contribute to long-term trend shifts**

Under DO 2, the following IRs will be achieved:

- Adoption of healthy reproductive behaviors and practices increased
- Child well-being improved
- Girls' education improved (retention and literacy)
- Increased youth economic productivity

## **DO 3: Community and household resilience in target populations increased**

Under DO 3, the following IRs will be achieved:

- Enhanced prevention and treatment of HIV, malaria and other epidemics among the most vulnerable
- Community and household assets increased and diversified
- Capacity to manage risk increased
- Key drivers of vulnerability as defined by beneficiaries addressed

Resilience is defined as “the ability of people, households, communities, countries and systems to mitigate, adapt to and recover from shocks and stresses in a manner that reduces vulnerability and facilitates inclusive growth.” (USAID, 2013). DO 3 will lessen both extreme poverty and also lessen the scale and impact of those households and communities who are “backsliding into poverty” by making households and communities more able to bounce back when shocks and stresses occur. Six types of significant shocks are considered: natural hazards, health shocks, price shocks, employment shocks, asset losses, and crime/safety shocks (source: Global Development Lab). Stresses can also include a chronic stress such as death, disability, or persistent poor health of a family member; food insecurity; drought; economic volatility; natural resource depletion; and increasing food prices.

The 2016–2020 CDCS integrates the Mission’s technical sectors; technical areas are no longer aligned with the DOs. The intention is to produce a CDCS in which technical sectors are cross-cutting and fully integrated. The Mission intends to continue many of the programs and activities implemented under the previous CDCS.

USAID expects to continue to provide support—to some extent—to these activities and will also support measures to combat illegal wildlife trafficking.

## **2. Environmental Threats and Opportunities Inherent in the Mission’s Strategy**

### ***DO 1: Key systems more accountable and responsive to Uganda’s development needs***

#### **Citizens actively participate in development**

A potential threat of this IR is:

- Without a citizenry more aware of the importance of ENR and the potential income to be derived by sustainable management of biodiversity resources, active participation in development decisions could give stronger voice to development over conservation, and for development projects that promise to provide jobs and income, but which may be environmentally destructive.

Opportunities to address ENR concerns—several of which would help address this threat—include the following:

- Strengthen ENR advocacy roles of NGOs, CSOs, and communities.

- Improve citizen participation in the EIA process.
- Strengthen EIA practitioner capacity to clearly present impacts and practical mitigation measures.
- Raise awareness of citizens of the importance of the ENR sector and the possibilities to balance development with conservation.
- Raise awareness of and disseminate information on biodiversity/natural resources-based enterprises that have the potential to generate income while conserving biodiversity. Provide assistance to develop natural resources-based enterprises, such as links to markets, support along the value chain.
- Develop and implement Payment for Environmental Services (PES) activities, especially for wetlands and catchments.
- Develop transparent access and benefit sharing arrangements between PAs and communities.
- Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves. Identify and support implementation of income generation activities that conservancies and other schemes could implement.
- Support development of land use plans in areas adjacent to PAs and support implementation of target activities that have the potential to benefit biodiversity conservation while generating income.

### **Key elements of the systems strengthened**

This IR presents no potential threats to the environment.

Opportunities to address ENR concerns are as follows:

- Obtain, compile, and provide useful environmental data to support decision making on development issues. Some of the specific data needs in the ENR sector are: value of natural resources; noise, air, and water quality standards with a focus on development projects in protected areas; inventories of wildlife, forests, and wetlands for planning and conservation purposes; and environmental monitoring methods for energy sector and other infrastructure development projects.
- Include valuation of ENR in the national planning and accounting systems to support increased budgets for ENR agencies.
- Using a competitiveness model, identify and attract environmentally “friendly” sectors and enterprises; identify public-private partnerships to support them; and provide training (focus on youth, vulnerable populations) in biodiversity/natural resources-based enterprise development.
- Provide training for NEMA, key line agencies, and District Local Government (DLG) staff in environmental impact assessment, mitigation, and monitoring; and use EIA model to demonstrate to GOU the utility of EIA and how it promotes wise/sustainable development; involve the public in EIA development.
- Expand Spatial Monitoring And Reporting Tool (SMART) monitoring system to additional PAs.
- Support the registration of community forests on communal land to ensure their sustainable management.
- Support local communities to register their customary land especially those with natural ecosystems.
- Improve coordination and capacity of agencies involved in enforcement of fire regulations.

### **The enabling environment that supports functional systems improved**

A potential threat of this IR is that:

- Given Uganda’s focus on national development, infrastructure, and modernization of agriculture, support for the enabling environment could focus on these policies without balancing them with environmental/conservation aspects.

Supporting ENR systems would help address this threat.

Opportunities to address ENR concerns include the following:

- Put in place a coordination mechanism for biodiversity and ENR-related agencies to collaborate and harmonize activities.
- Strengthen implementation of key policies and laws, such as the National Range Land Policy.
- Support finalization of the Wetlands Bill to strengthen protection of wetlands.
- Support finalization of the Land Use and Land Use Planning Policy.
- Support the establishment of taxation reforms to reduce tax on alternative clean energy sources such as electricity, cooking gas, and solar equipment to promote conservation of wood fuel sources.
- Support mainstreaming of climate change and ENR into national sectoral and Local Government planning as part of implementation of NDP II.

### **Transformative leadership developed**

This IR presents no potential threats to the environment.

Opportunities to address ENR include:

- Formulate and implement local policies and ordinances to reduce human-induced fires in areas of important biodiversity.
- Strengthen ENR and advocacy capacity of leaders who can advocate for balancing development with conservation.
- Identify and develop champions (individual and institutions) that can catalyze support for biodiversity and forest conservation and improved natural resource management. These champions need to be at various levels of government and civil society, and able to influence actions of others.
- Identify local solutions that could lead to biodiversity conservation; for example, totems (an animal, plant, or natural object or representation of an object that serves as the emblem of a clan or family among a tribal or traditional people; totems are protected and respected) and other traditional means for conservation.

### **DO 2: Demographic drivers shifted/affected/positively influenced to contribute to long-term trend shifts**

#### **Adoption of reproductive health behaviors and practices increased**

A potential environmental threat presented by this IR is from the disposal of healthcare waste (HCW), including expired pharmaceuticals. Mitigation will be needed to ensure that measures are put in place to handle, including dispose of, HCW in an environmentally sound manner.

An opportunity to address environmental/natural resources concerns is:

- Provide access to family planning programs in under-served areas surrounding PAs and other critical and threatened natural ecosystems.

#### **Child well-being improved**

A potential environmental threat presented by this IR is from the disposal of HCW, including expired pharmaceuticals.

- Mitigation will be needed to ensure that measures are put in place to handle, including dispose of, HCW in an environmentally sound manner. Specific handling including collection and disposal, practices should be integrated into each activity. Alternatively, a separate mechanism may be used that would be responsible for this aspect for all or most USAID activities that involve HCW. A mid-

term evaluation should be conducted to evaluate the success and shortcomings of HCW management—under whichever mechanism USAID chooses to use.

In addition, if USAID includes indoor residual spraying (IRS) for control of mosquitoes under this IR, handling of pesticides (use, storage, transport, mixing, disposal) could pose a threat to ENR. If USAID will distribute insecticide treated bed nets, disposal (including reuse/recycling) will need to be integrated into the activity.

### **Girls' education improved (retention and literacy)**

This IR presents no potential threats to the environment.

An opportunity to address ENR concerns is:

- Focus on girls' education in areas surrounding PAs and other critical and threatened natural ecosystems. When girls are educated, they are more likely to delay marriage and childbirth and break the cycle of poverty (<http://www.worldbank.org/en/topic/education/brief/girls-education>).

### **Youth economic productivity increased**

A potential environmental threat presented by this IR is that economic opportunities that are promoted may be environmentally damaging.

Opportunities to address ENR concerns are:

- Create employment opportunities in the ENR sector, such as with Collaborative Forest Management (CFM) Group, Wildlife Management Area, and conservancy enterprises; sustainable/organic agriculture, sustainable forestry and livestock, and alternative energy enterprises and energy-efficient cookstove businesses. Employment opportunities outside the ENR sector should also be promoted with a focus on opportunities that are not environmentally damaging. For example, skills development and employment opportunities could be supported in a range of technology areas (call centers, computer programming, computer repair, mobile banking, and other mobile technologies); vocational skills (mechanical, carpentry, and other trades); and value addition for on and off-farm products, as well as marketing and business skills.

### ***DO 3: Community and household resilience in target populations increased***

#### **Enhanced prevention and treatment of HIV, malaria, and other epidemics among the most vulnerable**

Potential environmental threats are from the disposal of HCW, including expired pharmaceuticals, and from use of pesticides for malaria interventions and insecticide-treated bed nets.

- Mitigation will be needed to ensure that measures are put in place to handle, including dispose of, HCW in an environmentally sound manner. Specific handling, including collection and disposal practices, should be integrated into each activity. As above (DO 2), a separate mechanism may be used that would be responsible for this aspect for all or most USAID activities that involve HCW. A mid-term evaluation should be conducted to evaluate the success and shortcomings of HCW management—under whichever mechanism USAID chooses to use.
- Mitigation is also needed to ensure environmentally sound handling (including use, storage, transport, and disposal) of pesticides for indoor residual spraying. The governing Pesticide Evaluation Report-Safe Use Action Plan should be reviewed by all implementing partners and updated if needed, based on the addition of any new activities, new geographic locations, new pesticides, and new implementing partners.
- Mitigation is also needed to minimize impacts of the use of mosquito bed nets. Safe methods of reuse and safe disposal should be promoted. Use as fishing nets should be discouraged. As a mitigation



measure, USAID should consider supporting the development of guidelines that can be adapted as community bylaws and promoted.

In addition, achievement of this IR could be placed at risk if potential climate change impacts to infrastructure necessary for delivery of health commodities are not considered. USAID should consider conducting climate change vulnerability assessments in geographic areas targeted under this IR.

### **Community and household assets increased and diversified**

Potential environmental threats presented by this IR are:

- Diversified livelihoods could include activities that are environmentally damaging; and
- Activities that make households and communities more resilient (by increasing assets and diversifying) may contribute to making biodiversity resources less resilient and could actually be environmentally damaging. This is especially the case for some infrastructure activities, but it may also be the case for income generation and NRM activities.

Opportunities to address ENR concerns include the following:

- Promote diversified livelihoods that are environmentally sound and that contribute to biodiversity conservation and environmental protection, such as natural-resources based enterprises (shea, beekeeping/honey production, medicinal plants, craft making, value-addition).
- Develop and support off-farm opportunities, including value addition enterprises, as well as enterprises unrelated to agriculture—technology-related, vocational, and professional.
- Develop transparent access and benefit-sharing arrangements with indigenous and local communities in areas adjacent to PAs and other fragile ecosystems.
- Develop PES schemes (focus on wetland and water catchment services).
- Support formation of conservancies and CFM groups and associated enterprises such as game ranching and ecotourism and subsidiary enterprises.
- Support conservation agriculture/climate-smart agriculture (eco-agriculture) to improve agricultural practices.
- Establish climate change resilience programs in vulnerable communities around PAs.
- Promote alternative energy, charcoal, and fire wood production as a sustainable enterprise.
- Develop Community Action Plans for biodiversity conservation in strategic areas.
- Formulate and implement land use plans that balance conservation and agriculture.
- Integrate climate change and ENR into development and sectoral plans at national and district levels and provide funds for implementation.

### **Capacity to manage risk increased**

This IR presents no potential environmental threats.

Opportunities to address ENR concerns are as follows:

- Prepare land use plans that balance conservation and agriculture and implement target LUP projects.
- Formulate and implement land use plans that balance conservation and agriculture.
- Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.
- Establish climate change resilience programs in vulnerable communities around PAs that target all production sectors to minimize poverty and food insecurity that lead to migration/encroachment to fragile ecosystems.

- Integrate climate change into development and sectoral plans at national and district levels and provide funds for implementation.
- Promote alternative energy, charcoal, and firewood production as a sustainable enterprise.
- Strengthen disaster risk reduction programs on zoonotics and emerging pandemics both in humans and wildlife.
- Development onsite laboratories and facilities for rapid diagnosis and response in high-risk areas.
- Support local communities to diversify their livelihoods through biodiversity-friendly enterprises, which eases pressure on the resource base; promote off-farm industries and employment opportunities.
- Put in place fire communication and early warning systems.

### **Key drivers of vulnerability as defined by beneficiaries addressed**

Potential environmental threats presented by this IR are mainly from “access to food improved.” As shown in the ETOA, agricultural expansion and encroachment into natural ecosystems, including PAs (national parks, forests, wetlands) and outside PAs (forests, savanna, wetlands) is the main threat to biodiversity in Uganda.

This IR should incorporate measures to ensure that increasing access to food/addressing key drivers of vulnerability will not result in further encroachment and agricultural conversion. The opportunities to address ENR concerns can, in part, address this threat; however, ongoing monitoring and adaptive management of interventions may be needed.

Opportunities to address ENR concerns include the following:

- Prepare land use plans that balance conservation and agriculture and implement target LUP projects.
- Promote conservation agriculture/climate-smart agriculture (eco-agriculture) to improve agricultural practices; and promote value addition and off-farm opportunities.
- Promote establishment of conservancies and community wildlife areas/local reserves, game ranching, and/or private reserves.
- Establish climate change resilience programs in vulnerable communities around PAs.
- Integrate climate change into development and sectoral plans at national and district levels and provide funds for implementation.
- Promote alternative energy, charcoal, and firewood production as a sustainable enterprise.
- Develop Community Action Plans for biodiversity conservation in strategic areas.
- Support local communities to diversify their livelihoods through biodiversity-friendly enterprises, which eases pressure on the resource base; promote off-farm industries and employment opportunities.

## **ANNEX C: BIOGRAPHICAL SKETCHES OF TEAM MEMBERS**

### **KAREN MENCZER SENIOR BIODIVERSITY CONSERVATION SPECIALIST/TEAM LEADER**

Ms. Karen Menczer is an international natural resources management (NRM) and biodiversity conservation specialist with nearly 30 years of experience in Latin America and the Caribbean, Africa, Eastern Europe, Asia, and the US, covering the following fields: Protected areas (PAs), wetland and watershed management, wildlife management, sustainable forestry, community-based natural resources management (CBNRM), eco/nature tourism, environmental impact assessment (EIA), and climate change mitigation and adaptation. She has worked with USAID and other donors, NGOs, governments, and communities to design environment/natural resources/biodiversity/climate change strategies, projects, and activities; implement, monitor, and evaluate environment, natural resources, agriculture, climate change, and other development activities, ensuring focus on achieving results; conduct environmental reviews (environmental assessments [EAs], programmatic and strategic EAs and Environmental Management Plans [EMPs]/Environmental Mitigation and Monitoring Plans [EMMPs]) to ensure that development activities are environmentally sound and comply with USAID, local, and other applicable regulations; strengthen environment/natural resources policies, regulations, and institutions; and implement and strengthen ecological/environmental monitoring and management in the field. Ms. Menczer served for nearly 10 years as a Natural Resources Advisor to USAID/Washington and USAID/Uganda and has conducted more than 25 evaluations of USAID biodiversity, agriculture, and democracy and governance projects around the world. She served as Team Leader/Biodiversity Specialist, for the 2011 USAID/Uganda Environmental Threats and Opportunities Assessment (ETOA) and the 2006 USAID/Ghana ETOA. In 2008–2009, she led ECODIT’s three-person team for conducting the USAID/Armenia FAA 118/119 Biodiversity Analysis.

- MS Ecology, Indiana University, Bloomington, Indiana, USA, 1983
- BS Biology, University of New Mexico, Albuquerque, New Mexico, USA, 1979

### **EUNICE NYIRAMAHORO DULI NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT SPECIALIST**

Ms. Eunice Duli is a Ugandan biodiversity and environmental management specialist with more than 24 years of experience in strategic planning and evaluation for natural resources management (NRM), community conservation efforts, collaborative management, conflict resolution, environmental impact assessments (EIAs), and monitoring and evaluation (M&E). She also has a strong background in sustainable tourism and community livelihoods programs, working to promote growth alongside responsible resource use. Ms. Duli has conducted numerous assignments for national and international donors, including the National Environment Management Authority, USAID, UNDP, WWF, and others. She also served for nearly 10 years in various progressively more senior positions at the Uganda Wildlife Authority (UWA).

- Post-Graduate Diploma Business Administration, Uganda, 2011
- MS Socio-Economic Information for Natural Resource Management, International Institute of Aerospace Survey and Earth Sciences (ITC), Netherlands, 1998
- BA Social Work and Social Administration, Makerere University, Uganda, 1990

**JANE BEMIGISHA**  
**CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT SPECIALIST**

Dr. Jane Bemigisha is a Ugandan climate change and natural resources management (NRM) specialist with more than 20 years of experience in designing, leading, and contributing to environment, climate change, and sustainable development work. She has skills and expertise in climate and environmental surveys, rural land evaluation and land use planning, strategic environment assessments, monitoring and evaluation (M&E), and human and institutional capacity building (HICD). Dr. Bemigisha has worked on numerous projects for the Government of Uganda, USAID, GIZ, WWF, and many other international organizations. She is the founder and chairperson of a think tank, Gender and Climate Change in African Agriculture (GECCAA), the coordinator of the Africa Chapter of the International Association of Landscape Ecologists, a member of Nature Uganda, and a member of the Uganda Association of Impact Assessors.

- PhD Natural Resources Management, Wageningen University, International Institute for Geo-Information Science and Earth Observation (ITC), Netherlands, 2008
- MS Environmental Systems Monitoring and Analysis, ITC, Netherlands, 1998
- BA Geography, Makerere University, Kampala, Uganda, 1989

**PATRICK BYAKAGABA**  
**FORESTRY AND LAND USE SPECIALIST**

Dr. Patrick Byakagaba is a forestry and land use specialist with more than 10 years of experience in forestry, environmental governance, natural resource management (NRM), and land use issues. He has conducted ecological and environmental assessments, created biophysical models, led technical trainings, and produced scientific reports on environmental issues in Uganda. Dr. Byakagaba has presented papers and participated in numerous conferences addressing forestry, land use, resource management, and other environmental issues and has conducted various research projects, including two Carnegie Phase III PhD Research Grant projects in 2008 and 2010. He is a member of numerous national and international environmental organizations, including The Society for Conservation Biology, the Uganda Forestry Association, Uganda's National REDD Working Group, and the National Forest Management Working Group. Dr. Byakagaba also serves as a member of the advisory board for EMLI Bwaise Facility, a Ugandan NGO focused on advocacy for sustainable environmental management.

- PhD Environmental Management, Makerere University, Kampala, Uganda, 2015
- MS Management of Natural Resources and Sustainable Agriculture, Norwegian University of Life Sciences, Norway, 2005
- BS Forestry, Makerere University, Kampala, Uganda, 2002

## ANNEX D: LIST OF CONSULTATIONS

### List of Consultations

Name	Organization	Title	Email address	Phone(s)
<i>Washington, DC, Consultations</i>				
Carol Collins; Matt Morley; Alice Macharia (by phone)	Jane Goodall Institute	Africa Program	<a href="mailto:amacharia@janegoodall.org">amacharia@janegoodall.org</a> <a href="mailto:mmorley@janegoodall.org">mmorley@janegoodall.org</a>	703-682-9271
Daphne Carlson Bremer	U.S. Fish & Wildlife Service, Division of International Conservation, Africa Programs	AAAS Science & Technology Policy Fellow	<a href="mailto:daphne_carlsonbremer@fws.gov">daphne_carlsonbremer@fws.gov</a>	703-358-2098
Jimmie J Mandima	African Wildlife Foundation	Director Program Design and Partner Relations	<a href="mailto:jmandima@awf.org">jmandima@awf.org</a>	202.939.3345
Peter Veit	World Resources Institute	Director, Land and Resource Rights Initiative	<a href="mailto:peterv@wri.org">peterv@wri.org</a>	202-729-7755
John T. Kerkering; Brehan Doud	U.S. Forest Service	Forest Service International Programs	<a href="mailto:johnkerkering@fs.fed.us">johnkerkering@fs.fed.us</a>	202-644-4635
Hadas Kushnir; Geeta Uhl; Mary Rowen; Kirsten Siex; Moffat Ngugi; Graceanna Enzinger; Clive Mutunga; Andrew Tobiason; Walter Knäusenberger	U.S. Agency for International Development	Bureau for Economic Growth, Education and Environment (E3); AFR/SD; FFP; FTF; Global Health Bureau; BFS	<a href="mailto:hkushnir@usaid.gov">hkushnir@usaid.gov</a>	202-712-1399
<i>Uganda Consultations</i>				
J. Ashley Netherton	USAID/Uganda	Natural Resources Officer	<a href="mailto:jnetherton@usaid.gov">jnetherton@usaid.gov</a>	(256) 414-306-001 x 6647
Jessica Okui	USAID/Uganda	Environmental Compliance Specialist	<a href="mailto:jokui@usaid.gov">jokui@usaid.gov</a>	(256) 414-306-001 x6556
Robert Senkungu	USAID/Uganda	Program Management Specialist/ Environment	<a href="mailto:rsenkungu@usaid.gov">rsenkungu@usaid.gov</a>	(256) 414-306-001 x6547
Shauna Hirsch	USAID/Uganda	Environment Team Leader	<a href="mailto:shirsch@usaid.gov">shirsch@usaid.gov</a>	
Mark Meassick	USAID/Uganda	Deputy Mission Director	<a href="mailto:mmeassick@usaid.gov">mmeassick@usaid.gov</a>	
Joe Hirsch	USAID/Uganda	Vulnerable Populations Team Leader	<a href="mailto:jhirsch@usaid.gov">jhirsch@usaid.gov</a>	
Zdenek Suda	USAID/Uganda	Program & Policy Development Office, Office Director	<a href="mailto:zsuda@usaid.gov">zsuda@usaid.gov</a>	

Name	Organization	Title	Email address	Phone(s)
Jenny VerNooy	USAID/Uganda	Program & Policy Development Office, Deputy Director	jvernooy@usaid.gov	
Lane Pollack	USAID/Uganda	Program & Policy Development Office, Learning Advisor	lpollack@usaid.gov	
Erin Wroblewski	USAID/Uganda	Program & Policy Development Office, Project Design Officer	ewroblewski@usaid.gov	
Sarah Mayanja	USAID/Uganda	Education Specialist	smayanja@usaid.gov	(256) 414-306-001 x 6165
Jana Wooden	USAID/Uganda	Education Officer	jwooden@usaid.gov	
Joyce Wamican	USAID/Uganda	Youth Advisor	jwanican@usaid.gov	(256) 772 138 523
Apell Oceng	USAID/Uganda	Policy & Enabling Environment Specialist	aoceng@usaid.gov	(256) 414-306-001 x 6646
Mark Wilson	USAID/Uganda	Deputy Director, Rights & Governance Office	mawilson@usaid.gov	(256) 414-306-001x 6592
Xavier Ejoyi	USAID/Uganda	Project Management Specialist-Conflict	xejoyi@usaid.gov	(256) 414-306-001 x 6601
Lyv Kakoncje	USAID/Uganda	Democracy & Human Rights Advisor	lkakoncje@usaid.gov	(256) 772 138 457
Nsamba Morris	USAID/Uganda	Monitoring, Evaluation, & Learning Specialist	mnsamba@usaid.gov	(256) 772 138 483
Simon Byabagambi	USAID/Uganda	Agronomist-Agriculture Unit	sbyabagambi@usaid.gov	(256) 772 138 473
Nicholas	USAID/Uganda	Vulnerable Unit		
Ann Marie	Uganda Conservation Foundation	General Manager	annemarie.weeden@googlemail.com	
Andy Roberts	Uganda Conservation Foundation	Board Member	ugandamaps@gmail.com	
Aventino Kasangaki	National Fisheries Resources Research Institute	Consultant Fish Biologist/Stock Assessment Scientist	aventinok@gmail.com	(256) 772 586 873
Francis Ogwal	National Environmental Management Authority	Natural Resources Manager, Biodiversity & Rangelands		
Mesfin Ayele	ACDI/VOCA, USAID/RWANU	Deputy Chief of Party	mayele@acdivocaug.biz	
Tracy Mitchell	Mercy Corps, USAID/Growth, Health & Governance Program	Chief of Party	trmitchell@ug.mercycorps.org	0788-060-884
Jones Ruhombe	USAID/Environmental Management for Oil and Gas Sector Activity	Chief of Party	Jones.ruhombe@uganda-emos.com	(256) 772 927714



Name	Organization	Title	Email address	Phone(s)
Jane Kisakye	USAID/Environmental Management for Oil and Gas Sector Activity	Monitoring & Evaluation-Training Specialist	Jane.kisakye@uganda-emos.com	(256) 772 419771
Sam Mwandha	African Wildlife Foundation, USAID/Uganda Biodiversity Program	Senior Program Officer, Conservation Planning	smwandha@awf.org	(266) 791 828762
Kaddu Sebunya	African Wildlife Foundation, USAID/Uganda Biodiversity Program	Chief of Party	ksebunya@awf.org	(256) 312-266653/4
James Lutalo	Ministry of Tourism, Wildlife and Antiquities	Commissioner Wildlife Conservation	jlutalo@tourism.go.ug	(256) 414 561 721
Anant Singh	The QED Group, USAID/Uganda Monitoring, Evaluation and Learning Program	Chief of Party	ASingh@qedgroupplc.com	(256) 774 622 561
Dr. Gladys Kalema-Zikusoka	Conservation Through Public Health	Founder and Chief Executive Officer	gladys@ctph.org	(256) 772 330 139
Nathan Uringi	USAID/Feed the Future Uganda Commodity Production and Marketing Activity	Coffee Value Chain Manager	nuringi@ftfcpm.com	(256) 393 202 920
Marcos Moreno	USAID/Feed the Future Uganda Youth Leadership for Agriculture Activity	Chief of Party	mmoreno@ftfyla.com	(256) 771 401 832
Dr. Isaiah Owiunji	World Wildlife Fund Uganda Country Office	Energy & Climate Programme Coordinator	iowiunji@wwfuganda.org	(256) 414 540 064
Berina Uwimbabazi	The World Bank	Senior Water Resources Management Specialist	buwimbabazi@worldbank.org	(256) 414 302 288
Herbert Oule	World Bank Uganda Office	Environmental Specialist	houle@worldbank.org	(256) 414 302 215
Onesmus Muhwezi	United Nations Development Programme	Team Leader, Energy and Environment	Onesimus.muhwezi@undp.org	(256) 417 112 100
Daniel Omodo McMondo	United Nations Development Programme	Programme Analyst, Energy and Environment	Daniel.omodo@undp.org	(256) 417 112 100
Margaret Kasumba	Uganda Wildlife Authority	Law Enforcement Coordinator		
Richard Kapere	Uganda Wildlife Authority	Planning Coordinator		(256) 772 688875
Kuka Aca Mosingazi	Uganda Wildlife Authority	Community Conservation Coordinator		(256) 772 419463
Justine Namara	Uganda Wildlife	Coordinator EIA		(256) 772

Name	Organization	Title	Email address	Phone(s)
	Authority			413432
Edgar Buhange	Uganda Wildlife Authority	Deputy Director, Planning		(256) 772 450468
Charles Tumwesigye	Uganda Wildlife Authority	Deputy Director, Conservation		(256) 772 461908
John Makombo	Uganda Wildlife Authority	Conservation Director		(256) 772 665225
Nelson Guma	Uganda Wildlife Authority	Queen Elizabeth Conservation Area, Conservation Area Manager	Nelson.guma@uganda wildlife.org	(256) 392 700 694
Lolcol Jino Jesuiew	Kaabong District LG	CTC/FAS		0782045304
Lomongin Emmanuel	Kaabong District LG	District Env. Officer		0781875675
Harold Kiryowa Lubanga	AWF/USAID Biodiversity Project; Kidepo NP.	Community Liaison Officer	klubanga@awf.org	0775965328
Christopher Tiyo	AWF/USAID Biodiversity Project; Kidepo NP	Program Officer	ctiyo@awf.org	0782949880
Benjamin Ateu	Karamoja Peace & Development Agency (KAPDA)	Program Manager		0779529186
Dominic Lopoyok	KAPDA	Zonal Manager		0775294764
Nangiro Simon P.A.	Mercy Corps, Kaabong	Conflict & Gov. Officer		0785210302
Oyugi Brian	Mercy Corps, Kaabong	Cropping Sector		0782454511
Okuda Denis	Mercy Corps, Kaabong	FF		
Abaol Peter	Karenga Subcounty	LC III Chairperson		0782909282
Abalu Kalisto	Karenga Subcounty	LC. III Vice Chairperson		0789368314
Johnson Masereka	Kidepo Valley National Park	Conservation Area Manager	mjohnson2015mr@gmail.com johnson.masereka@uganda wildlife.org	0772518342
Odokorwot Walter	Kidepo Valley National Park	Warden Community Conservation	odokorwot.walter@uganda wildlife.org	0772524129
Herbert Kitimbo	Kidepo Valley National Park	Warden Monitoring & Research	Herbert.kitimbo@uganda wildlife.org	0772568618
Okiring David	Kidepo Valley National Park	Sergeant Major-Monitoring & Research head ranger	okiring_david@yahoo.com	0782404062
Opio John Johnnic	Karenga Subcounty, Kaabong District	Subcounty Chief		0782527543
Engor Damian	Lobalangit Subcounty, Kaabong Subcounty	SAS		0772650630
Okello Saverio Pianki	Lobalangit Subcounty	LC III Vice Chairperson		0779333664
Henry Tito Okwalinga	IRS/USAID Project, Serere District	Project Manager	okwalinga_h@ugandairs.com	0772303505

Name	Organization	Title	Email address	Phone(s)
Achibu Ekwilu John Peter	Serere District Local Gov't.	District Fisheries Officer		0772698033
Oonyu Thadeo	Serere District Local Gov't.	District Health Inspector		0774206664
Okaka Samuel	IRS/USAID Project, Serere District	Community Mobilizer		0702946369
Munduru Mercy Grace	Mercy Corps Kotido District	Team Leader Gov. & Conflict		0777205360
Okello Robin	Mercy Corps Kotido District	Agronomist	rokello@ug.mercycorps.org	0772414019
Alex Bekunda	Mercy Corps Kotido District	Programme Manager/Financial Inclusion team leader	<a href="mailto:abekunda@ug.mercycorps.org">abekunda@ug.mercycorps.org</a>	0776078123
Ahamednur Lonwar	Mercy Corps Kotido District	Conflict & Gov. Officer		0775892222
Maggie McLoughlin	Mercy Corps Kotido District	MCH and Nutrition Manager	mmcloughlin@ug.mercycorps.org	0782301965
Adoko George	Kotido District Local Gov't.	CAO		0772586244
Abura Levi	Kotido District Local Gov't	District Natural Resources & Production Officer		0772844497
Lucy Iyango	Wetlands Department, MWE	Assistant Commissioner	iyangol2010@gmail.com	0772886422
Vicent Barugahare	Wetlands Department, MWE	Principal Wetlands Officer	vbarugahare@yahoo.com	0774434969
Khalid Muwembe	Uganda National Meteorology Authority	Principle Public Relations Officer	muwembe@yahoo.co.uk	0703829013
Dr. Panta Kasoma	Jane Goodall Institute	Executive Director	pmbkasoma@gmail.com	0772587284
Dr. Peter Apell	Jane Goodall Institute	Field Programs Manager	peter@janegoodallug.org	0772221637
Mr. Kazungu Bob	FSSD, MWE	Senior Forest Officer	bob.kazungu@gmail.com	0782712196
Issa Katwesige	FSSD, MWE	Senior Forest Officer	issakatwesige@gmail.com	0782432048
Xavier Mugumya	NFA-REDD+	NFA REDD+ Focal Officer	xavierm1962@gmail.com	0776408396
Mr. Polycarp Mwima	IUCN	Program Officer		0772602697
Mr. Julius Ariho	NFA	Monitoring and Evaluation Specialist	arijol@yahoo.com	0782306100
Amadi Leo Abumachi	Napong Village, Kapusi Parish, Kotido Subcounty, Kotido District	Agro-input farmer—GHG, Mercy Corps USAID Project		

### Community Group Meetings (ETOA Field Team-North)

Name of Group	Location	Activity
Fishing Community	Namutinda Landing Site—Lake Kyoga; IRS project	Malaria prevention through indoor mosquito spraying & mosquito nets
Nakaal Mothers Care Group	Nakaal Village, Panyangara Subcounty, Loposa Parish Kotido District	Lead Mothers Care Group
St. Monica Women Group	Kaabong District	Riverside Perma Gardens
Kraal Elders & Youths	Chamukok, Losilang, & Lokitalebu parishes; Kotido Subcounty; Kotido District	Communal Kraal management

### Community Group Meetings (ETOA Field Team-West)

Name	Position	Phone(s)
<i>Rurambira Parish—AWF Supported Conservancy adjacent to Lake Mburo CA</i>		
Ngamba Jotham	Gen. Secretary	0756899557
Bigaire Phoebe	Member	0751117591
Rubongoya R.	Publicity	0758347555
Kirabo Betty	Member	0755413533
Gordon Kirimani	Member	0757430034
Charles Atuhe	Programme Officer, AWF	0791828765
<i>Kalinzu Central Forest Reserve</i>		
Omony Peter	Forest Supervisor, Kalinzu Beat	0774175944
Agaba Lucky	Forest Supervisor, Nkombe Beat	0777398809
<i>Nyarugote Community— USAID Biodiversity Program Supported CFM Group</i>		
Muhumuza Robert	Member	0753761922
Tumwesigye Monic	Sec for Women	0755907614
Kihembo Deus	Treasurer	0775072101
Mwebaze Geoffrey	Chairperson	0774395352
Kundabo George	Committee Member	0772657431/0700230230
Tumuheise John Bosco	Secretary	078494483/0752138653
<i>FTF Commodity Production &amp; Marketing, Western Region</i>		
Henry Mawanda	Regional Business Manager, Western	0780258305
Bukonzo Joint Coffee Coop members (executive)		
Bukonzo coffee washing station members and producers		
Bukonzo coffee washing station members and producers		

## **ANNEX E: KEY CHANGES AND UPDATES FROM USAID/UGANDA 2011 ETOA**

Key changes since the 2011 ETOA was prepared are:

- the initiation of oil drilling and associated infrastructure development in the Albertine Rift; and
- the designation of Uganda among the “Gang of Eight” worst offending countries in the illegal ivory trade.

In addition, at the time the 2011 ETOA was prepared, urban expansion was not identified as a significant threat to biodiversity. But with Uganda’s rapid population growth—in 2011 Uganda’s population was approximately 35 million people (145/km<sup>2</sup>) and in 2014 it was 38,844,624 (161/km<sup>2</sup>)—urban expansion (including expansion of cities and transition of peri-urban areas and towns to urban areas) and ancillary development needs (roads, power generation, sewage treatment) have become significant threats to biodiversity.

The 2011 ETOA stated that two threats rose above the others as significant to biodiversity conservation in Uganda: oil sector development (also identified in the CDCS as a “game changer”) and land use conflict around PAs (related in part to another CDCS game changer, population growth). Changes since the 2011 ETOA—focusing on the status of oil drilling, the wildlife trade, and the population growth-related threat, urban expansion—are the focus below.

### **INITIATION OF OIL DRILLING**

As noted in the NBSAP (March 2015), oil and gas discovery has been a recent phenomenon in Uganda’s socio-economic development. By 2008, four oil fields (Mputa, Waraga, Nzizi, and Kingfisher) had been discovered, and a minimum of 300 million barrels of oil was estimated to be in the Kaiso Tonya area alone, which covers only less than 5 percent of the entire prospective belt. The GOU still plans to develop an inland refinery at Kabaale (Hoima District) in the Albertine Graben; the feasibility study has already been done.

Oil drilling failed to materialize as quickly as the CDCS and the 2011 ETOA had predicted; it was not the game changer that it was thought to be in 2011. This was mainly because oil and gas exploration proceeded at a slower pace than expected due to the drop in the price of oil and because of contractual issues. However, those consulted for the ETOA warned that the conservation community should not become complacent and should continue to build capacity in preparation for drilling (technical capacity to develop mitigation, guidelines for the oil and gas sector, resources to monitor impacts, and advocates for balancing conservation with development).

### **THE ILLEGAL WILDLIFE TRADE**

Although the 2011 ETOA identified illegal wildlife trafficking as a threat, the significance of the threat has grown since the previous ETOA was prepared. The 2011 ETOA stated, “Poorly regulated wildlife trade, especially in reptiles and birds, can adversely affect biodiversity. Between 2005 and 2010 there have been a number of seizures of illegally captured and traded wildlife according to the UWA CITES (Convention on the Illegal Trade in Endangered and Threatened Species) report. From the data available at UWA all the seized wildlife consignments have originated only from neighboring countries.”

Now, Uganda has been designated among the “gang of eight” worst offending countries in the illegal ivory trade. The “gang of eight” countries include the supply states, Kenya, Tanzania, and Uganda, plus the consumer states of China and Thailand. The group also includes three countries—Malaysia, Vietnam, and the

Philippines—that are important in the transit of ivory. The ETOA describes this threat and places it as the fourth most significant risk to biodiversity conservation. (Note: None of those that the ETOA Team consulted mentioned Uganda’s designation as one of the “gang of eight”—although the illegal wildlife trade was cited as a threat, this designation seems to have failed to make an impact.)

## **URBAN EXPANSION**

Urban expansion was not specifically among the threats the 2011 ETOA identified, yet the 2015 NBSAP states, “At national level, increasing human population and declining economic conditions have resulted into [sic] increased urbanization. Approximately 17 percent of Uganda’s population is now living in an urban setting with increased concentration along major trade routes. The effect of this urbanization on biodiversity, especially in relation to wetlands and vegetation in general is evident.”

Although agricultural expansion remains the main threat to biodiversity, urbanization is now exerting significant impacts on biodiversity. This 2015 ETOA describes these threats, with an emphasis on urban and peri-urban forest reserves and wetlands.



## ANNEX F: BIODIVERSITY AND PROTECTED AREAS

Table 12 lists Uganda’s PAs and important details. Figure 9 is a map of Uganda’s wildlife protected areas (national parks, wildlife management areas, wildlife reserves, and wildlife sanctuaries), and Figure 10 shows Uganda’s forest reserves (CFRs and LFRs). Figure 11 shows the Uganda’s wetlands and open water resources.

**Table 12: Overview of the Status of Wildlife Protected Areas**

	Protected area	Institution responsible	Protection status	IUCN category	Current staff*	Planned staff*	Date established	GMP published	Area km <sup>2</sup>
1	Bwindi impenetrable NP	UWA	National Park	II	179	209	1992	Up-to-date 2014–2014	327
2	Mgahinga Gorilla NP	UWA	National park	II	69	98	1991	Up-to-date 2014–2014	38
3	Queen Elizabeth NP	UWA	National Park	II	203	294	1952	Up-to-date 2011–2021	2,056
4	Semuliki NP	UWA	National Park	II	31	45	1993	Up-to-date 2005–2015	220
5	Kibale Forest NP	UWA	National Park	II	93	184	1993	Up-to-date 2015–2025	789
6	Rwenzori Mountains NP	UWA	National Park	II	111	158	1991	Up-to-date 2004–2024	995
7	Murchison Falls NP	UWA	National Park	II	405	559	1954	Up-to-date 2013–2023	3,877
8	Lake Mburo NP	UWA	National Park	II	177	88	1983	Up-to-date	370
9	Mt. Elgon NP	UWA	National Park	II	142	145	1993	Up-to-date 2009–2019	1,110
10	Kidepo Valley NP	UWA	National Park	II	131	213	1962	Up-to-date 2013–2023	1,431
11	East Madi	UWA, LG & Concessionaire	Wildlife Reserve	III	–	–		Included in MFCA GMP	829
12	Matheniko	UWA, LG & Concessionaire	Wildlife Reserve	III	–	–	1964	NA	1,757
13	Karuma	UWA	Wildlife Reserve	III	Covered under MFCA	Covered under MFCA	1964	Included in MFCA GMP	657
14	Ajai	UWA, LG & Concessionaire	Wildlife Reserve	III	15	29	1965	Included in MFCA GMP	148
15	Bokora Corridor	UWA, LG & Concessionaire	Wildlife Reserve	III	–	–	1964	NA	1,816
16	Bugungu	UWA	Wildlife Reserve	III	Covered under MFCA	Covered under MFCA	1968	Included in MFCA GMP	473

	Protected area	Institution responsible	Protection status	IUCN category	Current staff*	Planned staff*	Date established	GMP published	Area km <sup>2</sup>
17	Pian-Upe	UWA, LG & Concessionaire	Wildlife Reserve	III	29	121	1965	Up-to-date 2013–2023	2,304
18	Katonga	UWA, LG& Concessionaire	Wildlife Reserve	III	–	–	1964	NA	210
19	Kyambura	UWA	Wildlife Reserve	III	Covered under QEPA	Covered under QEPA	1965	Included in QECA GMP	154
20	Kigezi	UWA	Wildlife Reserve	III	Covered under QEPA	Covered under QEPA	1952	Included in QECA GMP	265
21	Kabwoya	UWA, LG & Concessionaire	Wildlife Reserve	III	13	20	1963	Included in KCA GMP	87
22	Kaiso-Tonya	UWA, LG & Local community	CWMA	III	–	–	1963	NA	
23	Toro-Semliki	UWA	Wildlife Reserve	III	31	45	1926	Up-to-date 2007–2017	542
24	Lipan	Community	Former controlled hunting area	VI	–	–	1963	NA	-
25	<a href="#">Karenga</a>	UWA, LG& Local community	CWMA	IV	–	–	2002	NA	956
26	UWEC	Ministry of Tourism, Wildlife and Heritage	Wildlife Sanctuary	IV			1951	Up-to-date	51
27	<a href="#">Ngamba Island</a>	CSWCT	Wildlife Sanctuary	IV			1998	Up-to-date	0.4
28	<a href="#">Otze Forest</a>	UWA/NFA	Wildlife Sanctuary	IV	–	–	1946	NA	204.8
29	<a href="#">Ziwa Rhino</a>	Private-with UWA oversight	Wildlife Sanctuary	IV			2005	Up-to-date	70.0

UWEC: Uganda Wildlife Education Centre

CSWCT: Chimpanzee Sanctuary and Wildlife Conservation Trust

NFA: National Forestry Authority

LG: Local Government

UWA: Uganda Wildlife Authority

CMWA: Community Wildlife Management Area

GMP: General Management Plan

KCA: Kibale Conservation Area

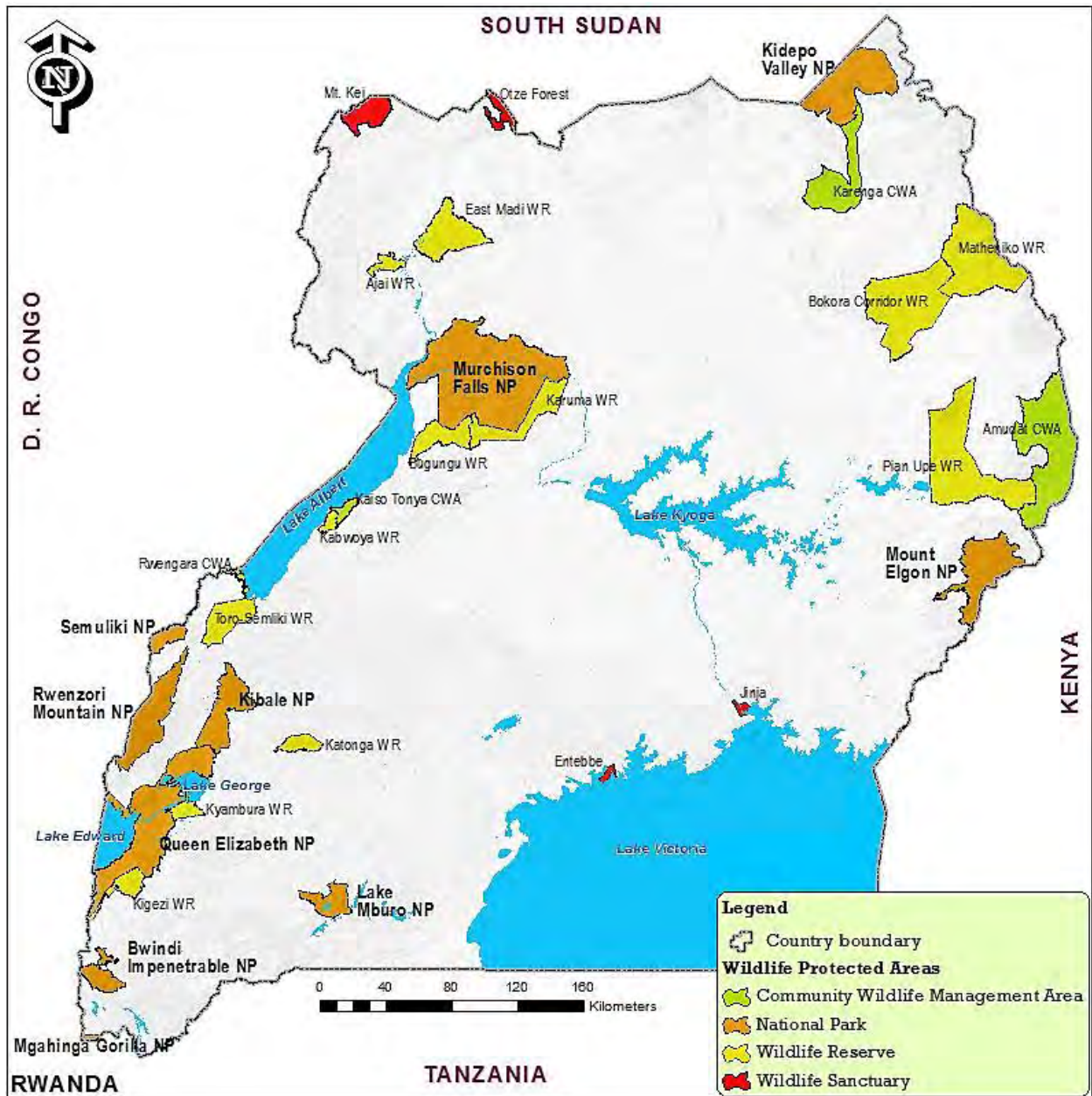
MFCA: Murchison Falls Conservation Area

QECA: Queen Elizabeth Conservation Area

QEPA: Queen Elizabeth Protected Area

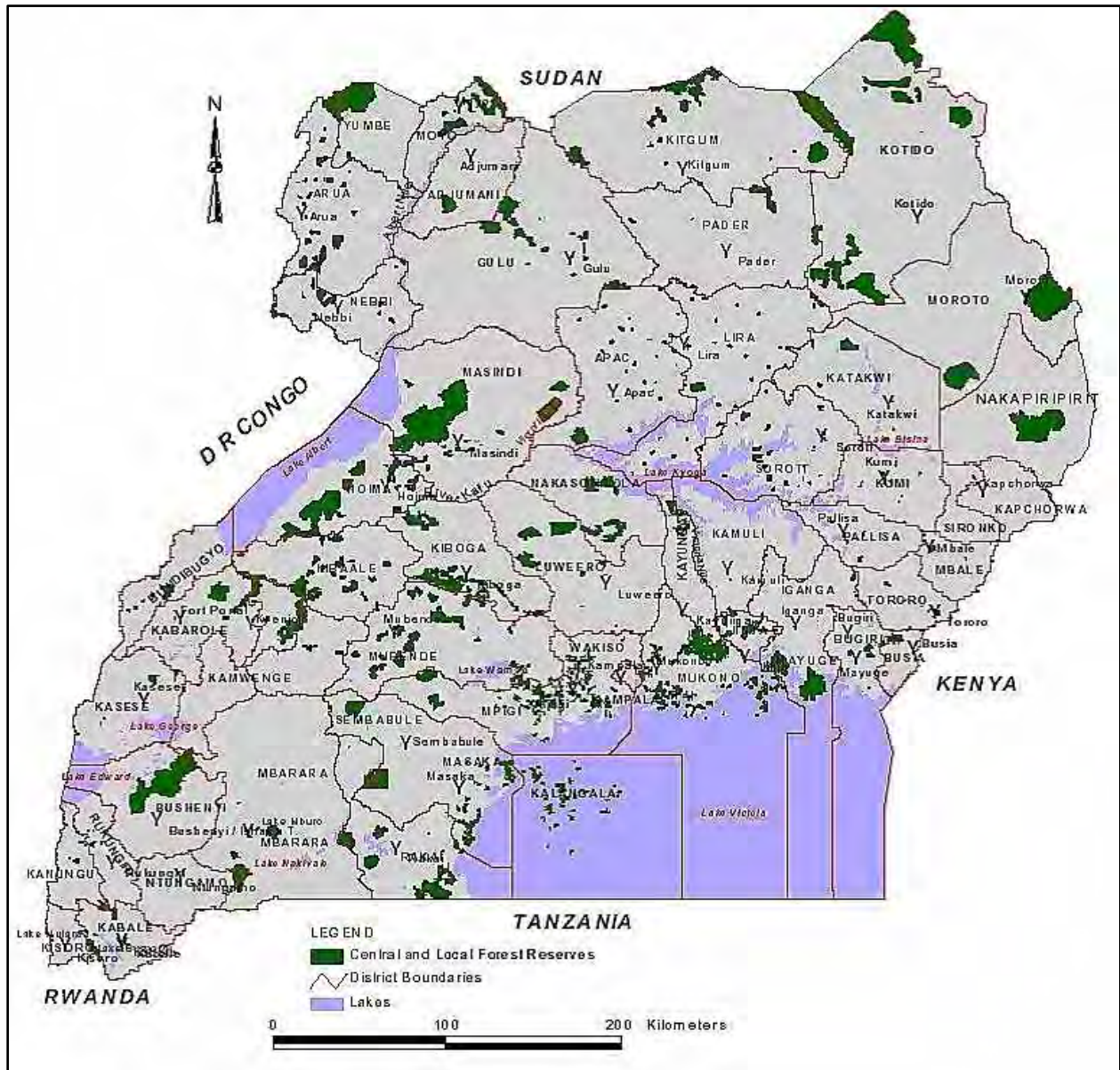
\* Current and planned staff are based on data from the GMPS.

**Figure 9: Wildlife Protected Areas in Uganda**



Source: Uganda Wildlife Authority (UWA), 2015

Figure 10: Central and Local Forest Reserves in Uganda



Source: NFA 2005



Figure 11: Uganda's Wetlands and Other Aquatic Resources



Source: NEMA, 2015

## ANNEX G: LAND USE AND BIODIVERSITY OUTSIDE PROTECTED AREAS (PAS)

The wildlife corridors and wildlife dispersal areas described below encompass forest, wetland and open water, and savanna ecosystems. Land use is mainly a mix of these natural ecosystems, agricultural, and small populated areas (villages and towns). The corridors and dispersal areas described below are critical for conservation of wildlife (from populations to genetic variability), and they encompass areas that are important for forest conservation outside of PAs and sustainable use of wetlands.

The information presented below should be considered in conjunction with **Recommendation 4** in **Section 8.2**: *To support geographical targeting based on threats and ecological importance.*

### CORRIDORS AND WILDLIFE DISPERSAL AREAS

Corridors and wildlife dispersal areas:

- Promote connectivity of species, plant communities, and ecological processes;
- Promote proper functioning of ecosystems;
- Contribute to protection of key habitats; and
- Enable movements of animals, including migratory species, from one part of the ecosystem to another.

Uganda's PA system includes PAs that act as wildlife corridors and dispersal areas; these are mainly community wildlife areas, wildlife reserves (WR), and some forest reserves (FR) (UWA, 2002; NFA, 2003). Other areas, such as private land and communal areas that are contiguous with PAs, are not part of the PA system.

### WILDLIFE CORRIDORS SURROUNDING QUEEN ELIZABETH CONSERVATION AREA

Wildlife corridors around QECA are used as migration routes and as seasonal food and water sources for wildlife; they help maintain elephant populations and genetic variability of many wildlife species (WCS, 2008).

The World Conservation Society Action Plan 2008 for Queen Elizabeth Conservation Area (QECA) corridors identified two categories of corridors, savanna and forest, that connect QECA to a number of neighboring PAs. **Figure 12** shows these seven wildlife corridors, linking QENP to Kibale National Park to the north; Kasyoha-Kitomi and Kalinzu-Maramagambo FRs to the southeast; and the DRC's Virunga National Park (VNP) to the west. Four of the corridors are savanna, and three are forest.

Wildlife dispersal areas and corridors in the Albertine Rift region face significant threats. In the northern Albertine Rift, the majority of forest area is under private ownership (legally owned under a title or customary tenure). In the early 2000s, 70 percent of the forest in the northern rift was on private lands (UNDP-GEF, 2007, in MWE, 2012). Estimates of deforestation rates predict that all private forests will be cleared in all districts by 2025 (WWF, WCS, JGI & CSWCT, 2010, in MWE, 2012).

With funding support from WWF and UNDP, the Ministry of Water and Environment carried out a priority-setting strategic planning process in 2012 to identify forest and woodland savanna corridors in the northern Albertine Rift that were critical for retaining migration routes and supporting gene flow among populations of vulnerable species (MWE, 2012). **Figure 13** and **Figure 14** show the land cover of the area at the time and identify potential key corridors connecting PAs from MFNP in the north to Toro-Semliki WR in the south. **Table 13** lists corridors within the Albertine Rift region, their ecological importance, and key threats.



In the strategic planning process, Payment for Environmental Services (PES), particularly through REDD+ payments, emerged as the most important potential source of funds for implementing the management plan of the identified corridors. Another intervention for conserving the corridors includes the biodiversity offset, with GOU funding for the priorities identified within the strategic plan; the remainder is expected to be from donor funding.

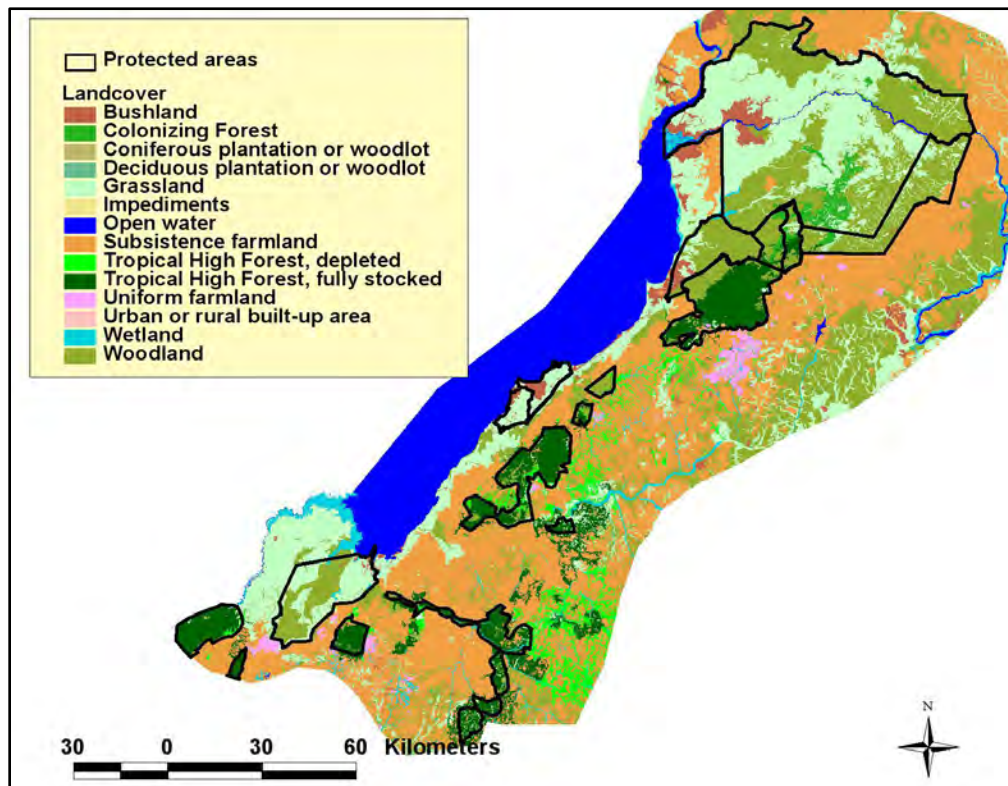
**Figure 12: Queen Elizabeth Conservation Area and Surrounding Wildlife Corridors**



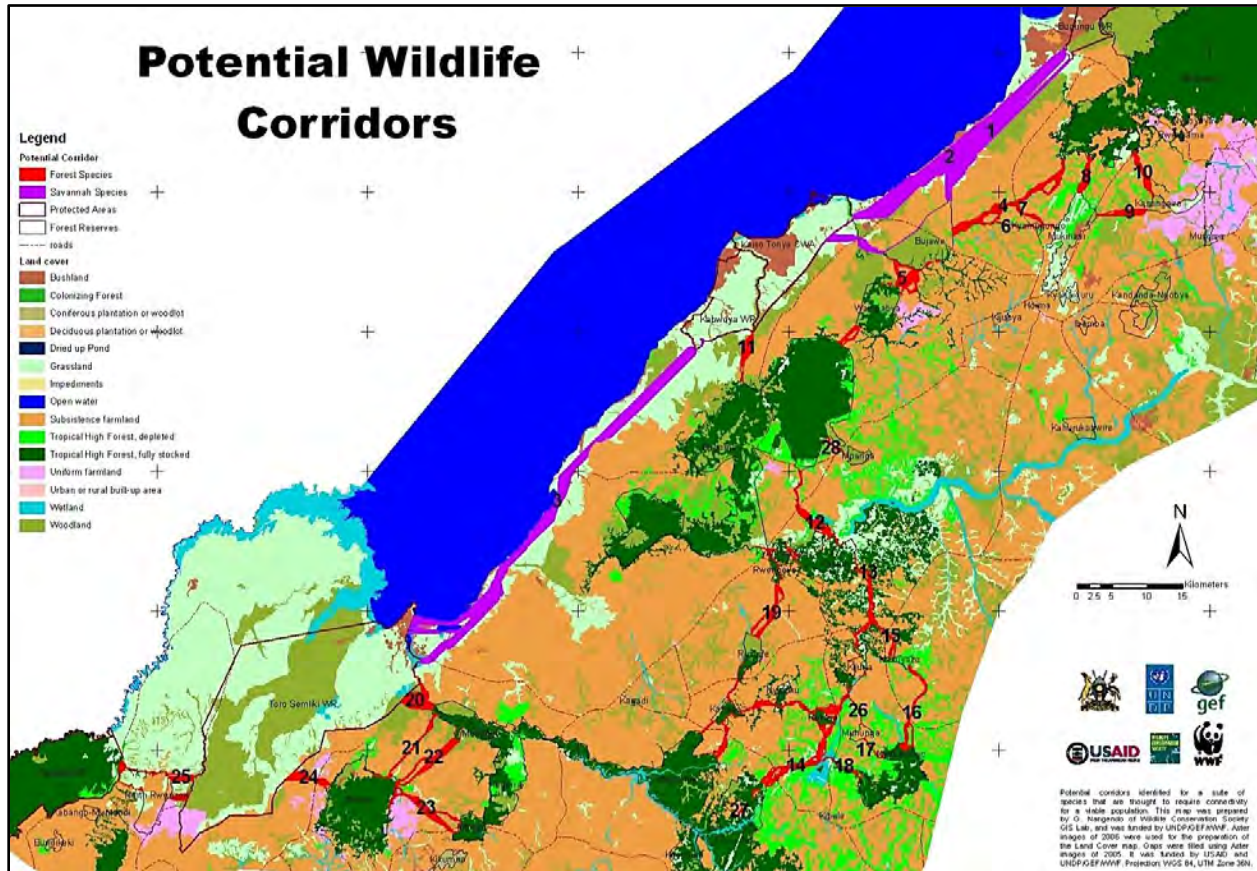
1. The Ishasha corridor linking southern QENP to Virunga National Park (DRC)
2. The Bwera corridor linking northern QENP to Virunga NP (DRC)
3. The Muhokya corridor within northern QENP
4. The Dura corridor linking northern QENP to Kibale NP
5. Kyambura/Kasyoha-Kitomi corridor
6. Kyambura Gorge corridor linking Kyambura and Kasyoha-Kitomi
7. Kasyoha-Kitomi/Kalinzu-Maramagambo corridor

Source: Wildlife Conservation Society, 2008

**Figure 13: Land Cover in the Northern Albertine Rift of Uganda in 2012**



**Figure 14: Potential Wildlife Corridors Identified by GOU to Maintain PA Connectivity in the Northern Albertine Rift**



**Identified key corridors:**

- (1&2)** Escarpment: Murchison Falls National Park to Kaiso-Tonya CWA; **(3)** Escarpment: Kabwoya to Toro-Semliki;
- (4)** Budongo to Bujagwe; **(5)** Bujagwe to Wampambya; **(5a)** Wampambya to Bugoma; **(11)** Kabwoya to Bugoma;
- (12a)** Bugoma to Rwengeye to Kyamyrangi to Kasato; **(13)** Kasato to Kijuna; **(14)** Kijuna to Rukara to Kagombe;
- (20)** Muzizi to Toro-Semliki WR

**WILDLIFE CORRIDORS AND DISPERSAL AREAS IN THE KARAMOJA REGION**

The Karamoja region has a number of conservation areas and habitats that act as wildlife migratory routes and dispersal areas (**Table 13**). Some are within PAs, some are partially within PAs, and some are not encompassed by PAs. These areas support a range of ecological processes and provide environmental services, such as the FRs that serve as water catchments for PAs and communities.

The forested corridors and dispersal areas include Kadam FR, which borders Pian-Upe, and Nyangea-Napore FR, which borders Kidepo Valley National Park and Karenga Community Wildlife Management Area in the east. The other wildlife corridors are the three community wildlife areas in Karamoja: Amudat, south of Pian-Upe WR; Karenga south of KVNP; and Irimi linking the southern boundary of Bokora Corridor WR to the northern boundary of Pian-Upe WR. Irimi CMW is one of the last remaining critical north-south wildlife corridors in Uganda (Manyindo et al., 2014).

The community wildlife areas are part of the customary communal land tenure in Karamoja, which is inhabited by the Karimojong pastoralists and agro-pastoralists. An assessment of the potential for community

tourism in the Karamoja sub-region (Manyindo et al., 2014) found that the community wildlife areas in Karamoja are some of the last areas in Uganda where fairly significant wildlife populations and varieties continue to survive in co-existence with people on communal land. In the same assessment, UWA officials reported evidence of recent migrations of buffalo from KVNP through Karenga Community Wildlife Area to the three WRs in south Karamoja. This appears to be a significant re-establishment of the old north-south wildlife migratory routes in the region. The existence of relatively healthy wildlife populations combined with Karimojong communities could provide a good foundation for community tourism in the communal areas. Manyindo et al. (2014) suggests that apart from the long-term potential for community tourism, given the current trend of improved security and wildlife recovery, there is potential for improved livestock management and wildlife tourism in the community wildlife areas.

Research on a private ranch in northern Kenya in an area similar to Karamoja indicates that managing both wildlife and livestock on the ranch, rather than for livestock alone, can raise annual earnings from \$1.50 to more than \$27 per hectare (Niemi et al., 2010 in Manyindo et al., 2014). Therefore, mixed cattle breeding and wildlife tourism projects in the community wildlife areas/corridors can offer a two pronged approach to improved livelihoods and biodiversity conservation outside PAs.

Manyindo et al. (2014), however, points out that for the livestock ranching/breeding and wildlife tourism to be sustainable and successful as drivers of improved livelihoods and biodiversity conservation, comprehensive land use planning to assess current land uses and options for the future will need to be carried out. Currently, only a land use plan for Karenga CWA has been done (only for two subcounties covering the CWA) under the USAID/Uganda Biodiversity Program. These efforts need to be expanded to cover other critical wildlife corridors to have sustainable achievements.

**Table 13: Ecological Attributes of the Wildlife Corridors and the Major Threats**

Category of corridors	Location	Key ecological attributes	Major threats
<b>Savanna Corridors</b>			
<b>Albertine Rift Region</b>			
Ishasha/Virunga corridor	Located on the western boundary of the southern sector of QENP along the River Ishasha, the boundary with the DRC	<ul style="list-style-type: none"> <li>• Riverine woodland and woody grassland</li> <li>• Connects QEPA with VNP in the DRC</li> <li>• Enables transboundary wildlife migration between QEPA and VNP (elephants, topi, tree-climbing lions, hippos, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Poaching</li> <li>• Armed conflict</li> <li>• Small size</li> <li>• Agricultural encroachment</li> </ul>
Bwera/Virunga Lubilia corridor	On the western boundary of the northern sector of QENP	<ul style="list-style-type: none"> <li>• Mixed wetland, grassland, and woodland habitat</li> <li>• Second link between QENP and VNP in the northern sector of QENP</li> <li>• Only protected migratory route for wildlife between the two parks</li> </ul>	<ul style="list-style-type: none"> <li>• Armed conflict</li> <li>• Grazing</li> </ul>
Muhokya corridor	Narrow strip (100 meters width) of QENP west of Lake George with a fishing village enclave	<ul style="list-style-type: none"> <li>• Links the Kasenyi and Dura regions of the park</li> <li>• Important for elephant movements, Uganda kob, waterbuck, and buffalo</li> </ul>	<ul style="list-style-type: none"> <li>• Small size, not viable on its own</li> <li>• Settlements</li> </ul>
Dura/Kibale Game corridor	Northern boundary of QENP	<ul style="list-style-type: none"> <li>• Part of the Lake George Ramsar Site, largest tract of wetland within QENP, the habitat includes grassland, swamp forest, woodland, and bush</li> <li>• Links QENP and Kibale NP, major</li> </ul>	<ul style="list-style-type: none"> <li>• Poaching</li> <li>• Dura Hima Factory-Lime mining license</li> <li>• Heavy metal pollution from</li> </ul>



Category of corridors	Location	Key ecological attributes	Major threats
		migratory route for elephants	mining operations
<b>Karamoja Region</b>			
Karenga CMA*	South of Kidepo NP	<ul style="list-style-type: none"> <li>• Dispersal area for elephants and buffalos</li> </ul>	<ul style="list-style-type: none"> <li>• Poaching</li> <li>• Settlements</li> <li>• Agriculture</li> </ul>
Amudat	South of Pian-Upe WR	<ul style="list-style-type: none"> <li>• Dispersal areas for wildlife from Pian-Upe</li> </ul>	
Iriri	South of Bokora WR and North of Pian-Upe	<ul style="list-style-type: none"> <li>• Linking Matheniko-Bokora WR to Pian-Upe, forming one of the largest north-south wildlife migratory routes in Uganda</li> </ul>	
<b>Forest Corridors</b>			
<b>Albertine Rift Region</b>			
Kyambura/Kasyoha-Kitomi corridor	East of QENP	<ul style="list-style-type: none"> <li>• Links Kyambura WR to Kasyoha-Kitomi FR</li> <li>• Important for movements of elephants, chimpanzees, and birds</li> </ul>	<ul style="list-style-type: none"> <li>• Insufficient corridor width (300–600 m wide)</li> <li>• Human-elephant conflicts</li> </ul>
Kyambura Gorge/Kasyoha-Kitomi corridor	East of QENP, forms the Kyambura Gorge containing Kyambura River	<ul style="list-style-type: none"> <li>• Cut into the savanna landscape with riverine forest and papyrus swamp where it connects to Kazinga Channel to the north. Kyambura gorge/river is an important corridor for birdlife and primates, including chimpanzees, connecting to Kasyoha-Kitomi Forest</li> </ul>	<ul style="list-style-type: none"> <li>• Agricultural encroachment</li> <li>• A significant portion of the riverine corridor passes through community land</li> </ul>
Kasyoha-Kitomi/Kalinzu-Maramagambo corridor	Southeast of QEPA, about 3 km in width	<ul style="list-style-type: none"> <li>• Grassland</li> <li>• Links QEPA with Kasyoha-Kitomi FR to Kalinzu and Maramagambo FRs</li> <li>• Migratory route for chimpanzees, wild pigs, duikers, striped jackal, serval cats, and jenets</li> </ul>	<ul style="list-style-type: none"> <li>• Bush burning</li> <li>• Cultivation</li> <li>• Grazing</li> </ul>
<b>Karamoja region</b>			
Kadam Forest Reserve	Mt. Kadam in Nakapiripirit District	<ul style="list-style-type: none"> <li>• Dry acacia savannas with <i>Juniperus-podocarpus</i> dry montane forest (some of the most endangered vegetation types in Uganda)</li> <li>• Water catchment area and wildlife dispersal</li> <li>• Borders Pian-Upe WR in the north</li> </ul>	<ul style="list-style-type: none"> <li>• Agricultural encroachment</li> </ul>
Nyangea-Napore Forest Reserve	Borders South Sudan to the north and Kidepo Valley NP and Karenga CWA to the east	<ul style="list-style-type: none"> <li>• Dry savanna woodland vegetation with</li> <li>• moist closed forest at high altitude</li> <li>• Water catchment for river sustaining water sources for wildlife in Karenga CWA and KVNP</li> </ul>	<ul style="list-style-type: none"> <li>• Agricultural encroachment</li> </ul>

\*Opportunity: A land use plan with future land use options and biodiversity conservation is in place.

Sources: Wildlife Conservation Society, 2008; Manyindo et al., 2014

## ANNEX H: CONSERVATION EFFORTS

This annex describes recent and ongoing conservation efforts in Uganda. Only activities and projects that directly support conservation are included; initiatives that tangentially or indirectly support conservation are not included. It covers GOU, NGO, university, private sector, and donor activities. The information is based on ETOA Team meetings with biodiversity sector stakeholders, documents, and websites. Given the number of initiatives, there may be omissions; however, the ETOA Team believes we have captured Uganda’s main conservation efforts. The ETOA Team attempted to identify any overlap (i.e., between funding entity and implementing entity). In some cases, the Team was unable to get the full set of information we requested about a specific conservation effort; where that is the case, it is noted below. Although the below information is not an evaluation of conservation efforts, when the ETOA Team was able to gather information on successes and shortcomings, they are noted.

### GOVERNMENT OF UGANDA CONSERVATION EFFORTS

The State of the Environment Report for Uganda 2012 (2014) notes that since the 2005/06 financial year, the GOU budgetary allocation for biodiversity conservation-related investments at the national level have increased. Investments have increased from US\$20 million to US\$27.7 million for tourism and wildlife and from US\$65 million to US\$82 million for water and environment. However, a component of this investment is from on-budget project support through donor projects (see below).

The NSOER (2014) describes a key issue for the environment sector: The GOU fails to give it financial priority compared to other sectors. Environmental authorities and activities receive considerably smaller allocations than other sectors, and in some cases, when finances are short, the environment sector is the first to lose its budget to other priorities. “At the national level, for example, financing was transferred from the environment to the education sector to sponsor free education” (NSOER, 2014).

Below is a discussion of a few recent and ongoing GOU conservation efforts that may be of particular interest to USAID during the CDCS 2.0 period. Key milestones reached are noted.

**Uganda Wildlife Authority (UWA):** UWA signed a number of collaborative management (CM) concession agreements with private partners to manage the following PAs: East-Madi, Katonga, Kabwoya, Pian-Upe, and Bokora wildlife reserves. The CM efforts have started to show positive results as illustrated by following examples (UWA 2015 records):

- The Pian-Amudat CM concession generated US\$107, 840 over the 2009–2014 period. Half of this revenue (about US\$50,500) was for the community wildlife association, and the rest was distributed according to the concession allotment between UWA and the local governments of Nakapirrit district and Amudati subcounty.
- In Kabwoya, more than US\$240,000 was generated from 2008-2014.
- In Katonga, US\$109,000 was earned from implementation of the CM scheme over the last five years.

Other economic benefits to the local communities are job creation and markets for their produce. Although the revenues are considerably small, they nonetheless demonstrate that there is potential for the PAs to directly contribute to improved livelihoods of the surrounding local people through sustainable harnessing of the PAs’ resources.

**National Forest Authority (NFA):** The NFA is currently marking forest reserve boundaries in the districts of Kyenjonjo, Kyegegwa, Kabarole, and Nakasongola. However, boundaries of 506 CFRs, about 11,000 km

of CFR boundaries, need to be delineated and marked, yet each year the GOU budget is adequate to delineate and mark only about 200 km.

According to the Forest Plan 2013, since 1997 when CFM began, it has grown to cover sites in 43 CFRs, involving 85 Collaborative Forest Management (CFM) groups. The process started off slowly with only two CFM agreements signed by 2004 (for Budongo and Tororo CFRs). By the end of 2010, 25 CFM agreements had been signed, while 60 were at various stages of development. (At the time the 2011 ETOA was conducted, 26 CFM agreements had been signed.) Forest-based enterprises, including bee-keeping, craft making, and fruit growing are in place as income-generating activities. However, according to the plan, communities have yet to substantially benefit from implementation of CFM agreements, and the Forestry Policy and law are not specific on benefits that should accrue to communities under CFM arrangements.

**Forest Sector Support Department (FSSD):** Uganda is currently in the process of formulating its REDD+ strategy. The FSSD is the REDD+ focal point and is responsible for operationalizing the processes for the development of the strategy. Efforts are underway to harness payment for environmental services from Uganda's forests through the REDD+ initiative and other voluntary carbon markets, such as Trees for Global Benefits implemented by ECOTRUST (see below).

FSSD has also undertaken a forest landscape restoration assessment to guide restoration interventions on degraded landscapes; developed a manual and subsequent framework for use of energy crops to reduce pressure on woodlands and forests; and implemented a project in partnership with the UN Food and Agriculture Organization to strengthen and register forests on private land and to declare community forests. As a result of this project, a growing number of private forest owners in Masindi, Lamwo, and Bushenyi districts have expressed interest in registering their forests.

**The Ministry of Water and Environment (MWE):** MWE developed and tested a wetland boundary demarcation strategy wherein it demarcated the five wetlands located in Kampala (Nakivubo, Kyetinda, Kinawataka, Lubigi, and Kansanga) and five municipal critical wetlands located in Jinja, Mbale, Gulu, Lira, and Bushenyi. Following eviction of the encroachers, a total of 2,079.4 ha of degraded wetlands were restored through natural regeneration. The NSOER (2014) points to this as an example of the opportunities that exist in the wetland sector to regenerate degraded wetlands by working collaboratively with all stakeholders, including government, communities, and the private sector.

**Directorate of Water Resources Management (DWRM):** South Africa Bottling Company (SABCO), which bottles Coca Cola Products in Uganda, is currently supporting the DWRM to restore the River Rwizi catchment in western Uganda. They have supported the Directorate with US\$50,000 to implement a six month (June–December 2015) project to restore the catchment. As part of this, IUCN was contracted to implement activities such as capacity building and livelihood diversification through a revolving fund that beneficiaries can borrow from at an interest rate of 5 percent, which can be used to restore wetlands in the catchment. The DWRM hopes to use this model in other catchments, such as for the River Mpanga in Kabarole District.

**District Local Governments (DLGs):** In some districts where the endangered shea tree (*Vitellaria paradoxa*) is found (e.g., Otuke, Pader, and Kitgum) DLGs have enacted bylaws to protect the tree from being harvested for charcoal. However, in most cases, enforcement of the bylaws has been weak.

## **DONOR-FUNDED CONSERVATION EFFORTS**

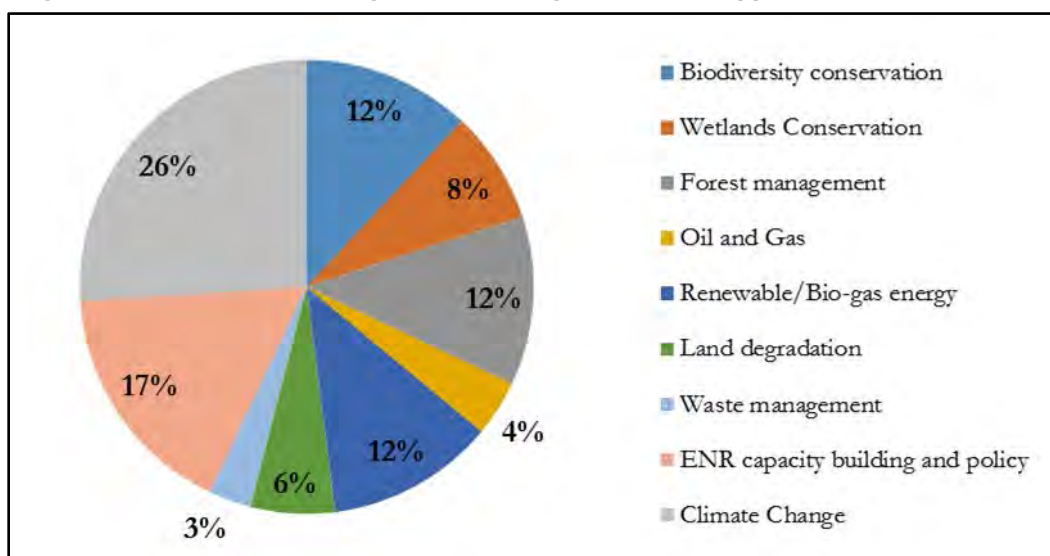
According to the NSOER (2014), budget support for tourism and wildlife from donors decreased from US\$11.2 million in 2005/6 to US\$4.7 million in 2011/12. (This amount only includes donors that provide direct budget support to the GOU; USAID's contribution is not included.)

**Figure 15** shows that as of 2013, climate change has the largest percentage of donor funding in the ENR sector, followed by capacity building and policy. When taken together, biodiversity conservation, wetland conservation, and forest management (all considered conservation efforts) have the greatest percentage of



donor funding in the ENR sub-sector. (As above, the ETOA Team was informed that **Figure 15** includes only donors that contribute directly to the GOU.)

**Figure 15: Pie Chart Showing the Percentage of Donor Support to ENR Sub-sectors**



Source: Ministry of Water and Environment, 2013: *Environment and Natural Resources Sector Actors, Landscape*

Current and planned donor-funded projects in the conservation sector, including those of USAID, are summarized in **Table 14** and **Table 15**. The following section briefly describes USAID/Uganda's conservation efforts and those of other USG agencies.

**USAID/Uganda Biodiversity Program**, implemented by African Wildlife Foundation and Jane Goodall Institute, improves the capacity of conservation institutions to effectively implement PA conservation and management strategies; improves access to conservation information through addressing key conservation knowledge gaps and perceptions; and creates opportunities for communities to benefit from biodiversity conservation. The program implements four models (see below), and has had notable achievements, examples which follow:

#### **Model I: Ecological Monitoring Capacity Development Model**

- In Budongo and Kalinzu CFRs, NFA field staff, tour guides, and community members have been trained and continue to collect monitoring data using the Open Data Kits.
- In Budongo CFR, two CFM groups (KICODA and NOBUFOCA) have provided support to develop conservation enterprises in line with the provisions in their CFM Agreements and Plans.
- Training and equipment was provided so that UWA can use Cybertracker for data collection and SMART for data management and analysis at the three program sites (LMNP, MFNP, and KVNP).

#### **Model II: Public and Private Sector Involvement in Conservation Model**

- In partnership with Uganda Wildlife Education Center and UWA, the program developed an education program for primary and post-primary students, used by UWA when students visit LMNP.

#### **Model III: Conservation Enterprise Model**

- In partnership with UWA, the program is supporting the communities adjacent to MFNP and KVNP to cultivate chili. The program has linked the communities to North East Chili Producers’ Association, which represents chili pepper farmer groups in eastern and northern parts of Uganda. The association has purchased chili from the farmers north of MFNP.
- The program provided enterprise support to CFM groups in Budongo and Kalinzu CFRs, including provision of beehives at each site and additional training in apiary development and apiculture management and production, bringing the total number of beehives at each program site to 400.
- The program completed the rehabilitation of two valley dams (Katete and Akabataka) by de-silting them. The valley dam user communities met and elected water user committees to oversee operations and maintenance of the dams.

**Model IV: Management of Wildlife Outside Protected Areas Model**

- The program supported the land use planning process and worked with the local government in Kaabong District to approve the implementation of the Karenga and Lobalangit land use plan.
- The program supported the establishment of a conservancy on ranches neighboring LMNP.

**USAID/Uganda Environmental Management for the Oil Sector (EMOS):** USAID, in partnership with private and public sector institutions—including Makerere University (see below), NEMA, UWA, NFA, Ministry of Energy, the MWE, and 10 DLGs in the Albertine Graben—is establishing programs that provide short- and long-term training, research, and other capacity-building activities. EMOS is strengthening capacity of: GOU institutions to manage the environmental impacts of the oil and gas sector; Ugandan professionals in the public and private sector to manage and respond to the environmental impacts of the oil and gas sector; and Ugandan civil society to participate in decision making in the oil and gas sector.

**USAID Uganda Biodiversity Trust Fund:** The principal goal of the project is to establish a private, independent, accountable Conservation Trust Fund to which other donors and the private sector are expected to contribute. The Wildlife Conservation Society (WCS) is facilitating the process of establishing the UBTF, which is meant to bridge the gap in biodiversity conservation financing in Uganda. The mission of the UBTF is to “Serve as a catalyst for mobilizing, managing and channeling financial resources for biodiversity conservation and sustainable use of natural resources in Uganda for the benefit of current and future generations.”

**The United States Fish & Wildlife Service,** from FY 2000 to FY 2014, has awarded 32 grants to conserve wildlife in Uganda, totaling US\$1,393,435. This was matched by US\$1,931,621 in additional leveraged funds. Funding was primarily provided through the African Elephant Conservation Act, the Great Ape Conservation Act, and the Rhinoceros-Tiger Conservation Act. During FY 2014, FWS supported “The expansion of intelligence led elephant management and protection throughout Uganda” (US\$69,870) in partnership with Uganda Conservation Foundation; and “Strengthening the capacity of UWA to tackle the ivory trade” in partnership with WCS (US\$78,397), among others.

The **United States Forest Service** supported an institutional analysis of the NFA, which will provide the basis of future USFS support to Uganda, specifically to NFA.

**Table 14: Donor-Funded Conservation Efforts**

<b>Donor</b>	<b>Project/Program Name</b>	<b>Activities supported</b>	<b>Years/Funding</b>
<b>USAID</b>	Uganda Biodiversity Conservation Program	Biodiversity monitoring in wildlife PAs and support for conservation enterprises that will enhance communities’ appreciation of Uganda’s natural resources, and reduce threats to biodiversity	2012– 2016  US\$10 million

Donor	Project/Program Name	Activities supported	Years/Funding
	Environmental Management for the Oil Sector	Build capacity within educational institutions, government agencies, civil society, and the private sector to be better prepare the country to manage and mitigate oil and gas development impacts on the environment.	2013-2017 US\$7 million
	Uganda Biodiversity Trust Fund	The goal is to establish a private, independent, accountable Conservation Trust Fund to which other donors are expected to contribute.	2014–2018 Amount unknown
<b>JICA</b>	National Wetlands Management Project	Supports upgrading the National Wetland Information System and Wetlands Management Plans and capacity building for wetlands staff	2012–2016 449.7 billion Japanese Yen, equiv. to 15 billion UGX
<b>World Bank</b>	Oil Districts Development Project	Improve the access of beneficiary communities to socioeconomic services and local economic development opportunities in the oil sector; improved land administration and dispute resolution enhanced management of the Albertine ecosystem,	2013-2017 US\$30 million
	Sustainable Natural Resources Management for Growth Project (Planned)	Poverty reduction through increased household/community income, and improved delivery of environmental services and enhanced resilience to climate change	5 years US\$45 million
	REDD + Readiness Preparation	Contribute to the design of a socially and environmentally viable national strategy for reducing emissions	2013–2015
	Competitiveness and Enterprise Development Project (CEDP)	In part, this component will support the hiring of three international tourism public relations firms to market Uganda’s tourism potential. the North American market, the British market and other European countries	2015–2018 US\$100 million (with \$25 million for tourism)
<b>French Embassy</b>	Promoting alternative sources of fuel and usage of energy saving stoves in Kampala as a means of mitigating climate change	Promoting use of briquettes and energy saving stoves in Kampala markets-creating employment, saving money, improving on health and behavior change and mitigating climate change. [ETOA Team note: Although this is a climate change project, promoting alternative sources of fuel and energy saving stoves should reduce pressure on forests.]	12 months 43,680 Euros
	Strengthening Environmental Governance at Village level in Kampala City	Strengthen environmental governance; strengthen environmental management lobby for increased budget support to environment sub-sector	Timeframe unknown UGX 80,000,000
	Tourism Development and Biodiversity Conservation	Support to Tourism and Biodiversity Conservation around Wildlife PAs-Lake Mburo National Park	Planned
<b>DANIDA</b>	An Integrated approach to natural resources	To empower communities with skills for improved natural resources management, increased agricultural productivity and better	Timeframe unknown

Donor	Project/Program Name	Activities supported	Years/Funding
	management in Northern Uganda	quality of life, support communities , schools and institutions in establishing ecological agri-business production gardens, energy saving technologies	2,173,999,922 UGX
	Strengthening Civil Society and Government for improved Forest Management and Certification in Uganda	Sustainable development and sustainable use/management of forests through FSC in Uganda	5 years 602,459 Euros
<b>Royal Netherlands Embassy</b>	Support to the Greater Virunga Transboundary Collaboration Secretariat	Supports transboundary biodiversity conservation activities around the Mgahinga and Bwindi PAs in Uganda (and Virunga, DRC and Volcanoes, Rwanda NPs)	Timeframe unknown Amount unknown
<b>EU</b>	Increased access to energy efficient stoves among rural households in Northern Uganda and enhanced local reforestation efforts to ensure the sustainability of trees as an energy source	Improve access to and increased use of local energy saving stoves among households in Kitgum and Pader districts, tree planting, and environmental awareness	2013–2015 953,390 Euros
<b>UNDP</b>	Addressing barriers to the adoption of improved charcoal production technologies and related sustainable land management practices through an integrated approach project	Addresses the challenges of unsustainable use of biodiversity for fuel wood and poor land management practices. Enhances national policy framework and promotion of sustainable land management and sustainable forest management.	Timeframe unknown US\$8,000,000
	Conservation and Sustainable use of the Threatened Savanna Woodland in the Kidepo Critical Landscape in North Eastern Uganda	Protection of biodiversity in the Kidepo Critical Landscape in North Eastern Uganda from existing and emerging threats. Among other efforts, it promotes sustainable use of the shea tree through conservation compatible livelihoods and incentives.	2011–2015 US\$13,480,000
<b>NORAD</b>	Conservation of the Rwenzori Mountains ecosystem	Strengthen the conservation of the Rwenzori Mountains ecosystem and maintain its biodiversity and water catchment value; reinforce the integrity and conservation status of RMNP	8 years 27.2 million NOKS
	Oil for Development Program	Provides support for an environment pillar aimed at improving environmental management and biodiversity conservation in the Albertine region.	Timeframe unknown Amount unknown
	Integration of Environmental Concerns and Civil Society Engagement in Petroleum	NORAD (Oslo) also supports WWF Uganda in capacity building for oil and gas environmental management.	Timeframe unknown Amount unknown
<b>ADB</b>	Farm Income Enhancement and Forest Conservation (FIEFOC)	Improve rural livelihoods and food security through sustainable natural resource management and agricultural enterprise development. Includes community watershed management and tree planting.	Loan of UGX 31.57 million and a grant of UGX 9.85 million

**Table 15: Bilateral and Multilateral Development Partners and Their Respective ENR Sub-sector Areas of Operations**

Environment and Natural Resources Actors (Bilateral and Multilateral DPs)	Thematic Areas								
	Biodiversity Conservation	Wetlands and Water	For-ests	Oil and Gas	Renew-able/ Biomass Energy	ENR Capacity Building and Policy	Climate and Climate Change	Land degrada-tion/ Manage-ment	Waste Man-agement
AfDB									
Belgium Embassy						xx	x		
DANIDA			x			x	x		
DFID							x		
EU	x		x		xxx		x	x	
FAO		x					x		
France					xxx	x			
GIZ		x				x	x		
ICEIDA							x		
Irish Aid						x			
JICA		x							
Netherland Embassy									
Royal Norwegian Embassy	xx		xxxx	x	x		x		
UNDP	xxx	x	x		x	xx	xxxxxx	xx	x
USAID	x			x			xx	x	
World Bank	x	x	x	x		xxx	x		x
<b>Total Projects</b>	<b>8</b>	<b>5</b>	<b>8</b>	<b>3</b>	<b>8</b>	<b>11</b>	<b>17</b>	<b>4</b>	<b>2</b>

“X” represents a single project supported by a donor partner in the respective ENR sub-sector.

Source: UNDP (October 2015)

## CONSERVATION EFFORTS OF NGOS

The main international NGOs involved in biodiversity conservation are described below.

**Wildlife Conservation Society (WCS):** WCS’s focus in Uganda is on three key landscapes critical for conservation: the Greater Virunga Landscape; Murchison-Semiliki Landscape, and the Kidepo Landscape. They also focus on several threatened large mammal and bird species. At target PAs, including CFRs, WCS

provides training and support for SMART (in part with USAID/Washington funding), which captures ranger-based anti-poaching and ecological data that can be analyzed to improve law enforcement. WCS engages with fishing communities that live legally within QENP to reduce lion and livestock conflicts. To this end, they are testing the efficacy of different solar lights to deter lions from entering human habitation at night and are also linking wildlife corridor conservation to improved cocoa production and markets. They are conducting surveys in Uganda to provide information to oil and gas companies and the GOU to help ensure that the most ecologically important areas are not slated for development. As mentioned above, WCS is working with USAID to develop a trust fund for biodiversity.

The Great Rift Lakes of Africa is considered one of **World Wildlife Fund's (WWF)** Critical Regions of the World. WWF's work in this region focuses on sustainable development, environmental education, and the involvement of communities in the design and implementation of conservation activities. WWF is piloting and building capacity for sustainable forest management through FSC Forest Certification around Kalinzu CFR and Kalangala LFRs and CFRs, and supported preparation of the Kalinzu FMP. WWF implements Oil and Gas Development in the Albertine Rift Region, which is the Uganda component of a WWF Norway project, "Integration of Environmental Concerns and Civil Society Engagement in Petroleum." It aims to lay a foundation for better integration of environmental concerns and improved engagement of civil society in petroleum resources development in Uganda and the Albertine Rift region. Previously, WWF implemented the Rwenzori Mountains Conservation and Development project to devise and implement a scientifically based conservation strategy for the park.

**International Union for the Conservation of Nature (IUCN)** works in partnership with IUCN members and government to design and implement interventions that ensure biodiversity conservation and sustainable livelihoods especially among vulnerable communities. It is at the forefront of promoting sustainable management of the Mt. Elgon ecosystem. IUCN promotes nature-based solutions in areas of Mt. Elgon and Karamoja, which are particularly sensitive to the effects of climate change, demonstrating improved natural resource governance through an integrated water resource management planning process. In partnership with the Ministry of Water and Environment, IUCN provides technical support in designing and implementing the REDD+ program.

**African Wildlife Foundation** and **Jane Goodall Institute** activities in biodiversity and forest conservation are described under USAID/Uganda Biodiversity Program, above.

Some of the key local NGOs involved in biodiversity conservation are:

- **Conservation Through Public Health (CTPH)** works at the nexus of human and wildlife health with a focus on management and control of zoonotic diseases in great apes, particularly mountain gorillas. The US FWS provided a grant in FY 2014 to CTPH to reduce the risk of disease transmission between people and mountain gorillas by improving the health and hygiene of Batwa communities that neighbor Bwindi Impenetrable National Park (US\$49,988).
- **Nature Uganda** works in CFM, conservation education, and eco-tourism around Echuya Forest Reserve.
- **Ecotrust** works with private forest owners and landowners to manage forests and plant trees as part of their Trees for Global Benefit program.
- **Uganda Conservation Foundation** works closely with UWA to sensitize communities and demonstrate through practical projects how financial benefits can be gained from conservation. Some of their recent and ongoing projects are: Bukorwe Ridge Elephant Trench (supporting UWA and local communities to dig a 20 km trench along the Bukorwe escarpment in the Ishasha Sector of QECA); the Waterways Project (UCF in partnership with National Lake Rescue Institution and UWA provided the first of what is planned to be a series of fully equipped ranger boat stations to improve law enforcement to address poaching); and Sustainable Vermin Control in Hoima and



Masindi Districts of Uganda to address crop raiding by wildlife through the identification and establishment of effective problem animal control methods.

Organizations engaged in advocacy and lobbying are:

- **Civil Society Coalition on Oil (CSCO)** and **Green Watch** are involved in capacity building and sensitization on environmental management concerns in the oil and gas sector.
- **Advocates Coalition for Development and Environment (ACODE)** and **Uganda Wildlife Society** work in advocacy engagement for good environmental governance and policy dialogue.
- **Climate Action Network Uganda (CAN-U)** focuses on debating and lobbying for the climate change agenda.
- **Nature Harness, Tree Talk, and Environment Alert** are involved in building awareness, capacity, and governance mechanisms for private forest owners and community groups to plant, grow, and protect trees as mitigation measures for climate change impacts and to minimize the impacts of potential disasters.

CSOs, especially at local and national levels, are faced with a number of challenges such as limited capacity to raise funds, sometimes conflicting with government due to advocacy mandates of some CSOs, inaccurate reporting and use of evidence by some members, limited ability to influence policy at LG levels, and inadequate understanding of specific engagement processes at national and LG levels. CARE International and WWF Uganda are building capacity of CSOs to address some of these issues.

## **CONSERVATION EFFORTS AT UGANDA'S UNIVERSITIES AND RESEARCH INSTITUTIONS**

At **Makerere University**, programs related to biodiversity and forest conservation and research are offered in the **School of Forestry Environmental and Geographical Sciences (SFEGS)**. Some projects that the SFEGS is undertaking are the establishment of a **Climate Change Centre** (USAID-funded through ERICCA), management of the **National Biodiversity Databank**, and development of curriculum training in oil and gas (both with support from USAID/EMOS).

Biodiversity and forest research institutes affiliated with the universities include **Makerere University Biological Field Station (MUBFS)**, located in Kibale National Park, and the **Institute of Tropical Forest Conservation (ITFC)**, located in Bwindi Impenetrable National Park and affiliated with **Mbarara University of Science and Technology (MUST)**.

National Research Institutions involved in research that promotes biodiversity conservation include the **National Forestry Resources Research Institute (NaFORRI)** and **National Fisheries Resources Research Institute**. NaFORRI in Kifu Forest Station undertakes research in agroforestry, forest conservation, and forest products to generate appropriate technologies for increasing the productivity and supply of forest products on a sustainable basis.

# ANNEX I: POLICY/LEGAL AND INSTITUTIONAL FRAMEWORKS

## Relevant Ugandan Policies, Legislation, Plans, and Strategies

### *POLICIES*

**The National Environment Management Policy (1994):** The GOU is currently reviewing the National Environment Management Policy to 1) address new and emerging environmental issues and challenges that the policy in its current form does not emphasize, such as oil and gas issues, electronic waste, climate change, disaster risk management, bio-technology, and bio-safety issues; 2) integrate the ongoing post-2015 Sustainable Development Goals Agenda; 3) take into account other national and regional commitments including the National Vision, National Development Plan (NDP), East African Community Protocols, policies, and strategies on environment and development; and 4) emphasize institutional roles including the private sector.

**The National Policy for the Conservation and Management of Wetlands Resources (1995):** This policy was formulated with the overall aim to promote the conservation of Uganda's wetlands to sustain their ecological and socio-economic functions for the present and future well-being of the people. Policy interventions include community participation; wetlands management planning at inter-district level (wetlands management frameworks based on ecosystem approach) and site level (Wetlands General Management Plans); and resource assessments of wetlands. The Uganda Wetlands Policy is globally considered one of the best, but implementation has been stifled by shortage of funds, bureaucratic discord, the politicization of wetland issues involving degazettement promises during political campaigns, and titling of land within gazetted wetlands. Limited knowledge among local communities about wetlands resources is a persistent limitation to policy implementation despite efforts on sensitization.

**The Uganda Wildlife Policy (2014):** This policy resulted from the revision of the 1999 version having realized that several GOU policies that impact or are impacted by Wildlife Policy have emerged including the Oil and Gas Policy, the National Development Plan II, and the Land Use Policy for Uganda, among others. Revision is also needed to align with other government policies and to refocus the sector to effectively contribute to the national transformation for prosperity. The 2014 policy, therefore, addresses emerging issues including oil and gas, human-wildlife conflict, the illicit wildlife trade and trafficking, and community participation in PA conservation. Ongoing also is the formulation of the new Wildlife Act and regulations to implement the policy. Whereas the 1999 Wildlife Policy emphasis was on conserving PAs as significant areas of biological resources representative of major habitats of Uganda, the new policy also puts emphasis on strengthening management of wildlife outside of PAs and HWC; defines strategies for ensuring net positive impacts from infrastructure developments and extractive industries in PAs; and states the need to effectively combat wildlife crime through revision of the Wildlife Act and formulation of regulations, among other strategies.

**The Energy Policy for Uganda (2002):** The policy seeks to align with the 1995 Constitution of the Republic of Uganda that states: "The State shall promote and implement energy policies that will ensure that people's basic needs and those of environmental preservation are met." Energy development and environmental damage are intricately related, and therefore, the policy recognizes the need to mitigate both the physical and social environmental impacts created by energy development, especially hydropower. However, regulation of existing and planned energy developments, such as hydropower, thermal, and petroleum in the PA system, is a concern raised by PA managers who mentioned during meetings with the

ETOA Team that they lack capacity to evaluate pre-implementation and to monitor post-implementation energy developments.

**The National Biotechnology and Biosafety Policy (2008):** The goal of this policy is to contribute to national goals of poverty eradication, improved healthcare, food security, industrialization, and the protection of the environment through the safe application of biotechnology. One of its guiding principles is addressing national development challenges including food security, healthcare, biodiversity conservation, and industrialization. A specific policy action is that well-regulated conservation and sustainable utilization of Uganda's natural resources will be enhanced through judicious application of biotechnology.

**National Oil and Gas Policy for Uganda (2008):** The policy goal is to use the country's oil and gas resources to contribute to early achievement of poverty eradication and create lasting value to society. Objective 9 of the policy is to ensure that oil and gas activities are undertaken in a manner that conserves the environment and biodiversity; this is critical considering the discovery of oil and gas resources in the Albertine Graben, a biodiversity hotspot. The policy sets out the institutional framework including an Environmental Management Pillar to achieve this objective.

The policy identifies institutional responsibilities for monitoring impacts to wildlife and spells out roles and responsibilities of relevant stakeholders. In the policy, biodiversity conservation is relegated to the Ministry of Water and Environment, Ministry of Tourism, Wildlife and Antiquities, Ministry of Agriculture, Animal Industries and Fisheries, National Environment Management Authority, Uganda Wildlife Authority, National Forestry Authority, and Uganda National Council for Science and Technology, among others.

As a consequence of the policy, laws, regulations, and policies of the pillar institutions, such as Environment and Wildlife, have been revised, and others are planned to follow. Key new laws were enacted to operationalize the policy, including the Petroleum (Exploration, Development and Production) Act (2013) and the Petroleum (Refining, Conversion, Transmission and Midstream Storage) Act (2013). The two acts have mainstreamed environment and biodiversity provisions. As part of this effort, GOU is drafting environmental quality standards, including standards on air quality, water quality, discharge of effluents into water, control of noise and vibrations, noxious smells, pollution, subsonic vibrations, and soil quality.

**The National Agriculture Policy (2013):** The overall objective of this policy is to achieve food and nutrition security and improve household incomes through coordinated interventions that focus on enhancing sustainable agricultural productivity and value addition, providing employment opportunities, and promoting domestic and international trade.

**Uganda National Climate Change Policy (2015):** This policy seeks to guide all climate change activities and interventions in the country. The goal of the policy is to ensure a harmonized and coordinated approach towards a climate-resilient and low-carbon development path for sustainable development. The overarching objective of the policy is to ensure that all stakeholders address climate change impacts and their causes through appropriate measures promoting sustainable development and a green economy. The policy provides guidelines for incorporating climate change into sectoral and local government plans and budgets; the intention is to help meet Vision 2040's goals through strategies and actions that address both sustainable development and climate change and also help the GOU achieve the post-2015 Development Agenda and other internationally agreed development goals without compromising the environment and natural resource base.

The Climate Change Policy sets out institutional arrangements that include the Ministry of Water and Environment as the host of a new Climate Change Department and other key Coordinating Ministries and Authorities, particularly, the Ministry of Finance, Planning and Economic Development, the National Planning Authority, and the MLG. At the district level, while the climate change focal point will be anchored within the Natural Resources Department of the DLG, all departments will ensure that climate change issues are integrated into District Development Plans and provision will be made in district-level Indicative Planning Figures for each sector to ensure they can address climate change policy priorities, along with the setting of

relevant performance indicators. The existing Environment Committee at the district level will act as a mechanism to ensure cross-sectoral coordination.

**Forest Policy (2001):** The policy provides for maintenance of the permanent forest estate and policy guidelines for sustainable forest management. The main goal of the policy is an integrated forest sector that achieves sustainable increases in economic, social, and environmental benefits from forests and trees for all people of Uganda, especially the poor and vulnerable. The Forest Plan 2013, however, outlines a number of challenges; for example, that the policy and law are not specific on benefits that should accrue to communities under CFM arrangements.

**The National Land Use Policy (2007):** This policy provides for sustainable land use management in Uganda in which conservation is identified as a form of land use. The policy calls for sustainable management of PAs and biodiversity conservation in general. Since formulation, however, the country has not yet developed a land use plan and this gives room for irregularities in allocation of land to unsuitable uses at household and other levels of holding.

### *LAWS AND REGULATIONS*

**The Constitution of Uganda (1995):** The ultimate legal instrument governing the management of Uganda's biodiversity and natural resources is enshrined in the Constitution of Uganda (1995), which states that the State shall protect important natural resources, including land, water, wetlands, minerals, oil, fauna, and flora on behalf of the people of Uganda.

**The National Environment Act Cap 153:** The act is a framework law on environment providing for sustainable management of the environment; establishment of an authority as a coordinating, monitoring, and supervisory body for that purpose; and for other matters incidental to or connected with the foregoing.

**Forestry and Tree Planting Act (8/2003):** This is the legal framework for management of forest resources. The act establishes CFRs and other forest reserves, as well as a tree fund, and provides for collaborative forest management, licenses, the EIA process for developments intended in forest reserves. However, an environmental audit report (OAGU, 2010) indicates that the regulations to operationalize the act, have never been developed; without these, adherence to the provisions of the act may not be effectively enforced.

**Land (Amendment) Act (2010):** This amends the Land Act to enhance the security of occupancy of lawful and bona fide occupants on registered land in accordance with Article 237 of the Constitution.

**The Uganda Wildlife Education Center Bill (2013):** The bill is before Parliament awaiting passage into law. It seeks to transform and widen the current Uganda Wildlife Training and Research Institute into a National Wildlife Research Agency performing the training and research functions of the defunct Institute of Ecology, formerly in QENP.

**Biotechnology and Biosafety Bill (2012):** This is now before Parliament and seeks to effect implementation of the National Biotechnology and Biosafety Policy (2008).

**Plant Protection and Health Bill (2010):** The bill, yet to be passed by Parliament, is expected to introduce mechanisms for minimizing the risks of involuntary gene transfers and for managing the risks involved in biotechnology research and development.

**The National EIA Regulations (1998):** These regulations deal with the EIA process, including project briefs and environmental impact studies. It provides for EIA review processes, including invitation of general public comments and public hearings, and the role of the Executive Director of NEMA to reject or cancel an EIA certificate.

**The National Environment (Noise Standards and Control) Regulations:** These regulations aim at ensuring the maintenance of a healthy environment for all people in Uganda, the tranquility of their

surroundings, and their psychological well-being by regulating noise levels; and generally to elevate the standards of living of the people by prescribing acceptable noise levels for different facilities and activities.

Other relevant laws include the Water Act (Cap 152) and the Mining Act 2003. Other relevant regulations include the National Environment (Management of Ozone Depleting Substances and Products) Regulations, 2001, and the National Environment (Waste Management) Regulations, 1999.

### ***STRATEGIES, PLANS AND PROGRAMS***

**The Uganda Vision 2040:** This is a key GOU development planning framework. The vision is “A transformed Ugandan society from a peasant to a modern and prosperous country within 30 years.” It envisions the transformation from a predominantly low income to a competitive upper middle income country within that timeframe. The theme of the vision is “accelerating Uganda’s socioeconomic transformation.” The vision recognizes the importance of the ENR sector and notes that the level of compliance to ENR policies, laws, regulations, and standards is still very low, leading to misuse and degradation of the environment. Over the Vision 2040 period, efforts will be on attaining a green and clean environment while conserving the flora and fauna and restoring and adding value to ecosystems and sustainable utilization of the ENR for furthering implementation of Agenda 21 and the Plan of Implementation of the World Summit on Sustainable Development. In addition, the concept of the green economy will be considered in the context of sustainable development and poverty eradication as one of the important tools for achieving sustainable utilization of the ENR sector.

**The National Development Plan II (NDP II):** The thrust of the NDP II is to propel Uganda to middle income status in the next five years through prioritizing investment in five key growth drivers with the greatest multiplier effect (agriculture; tourism; minerals, oil and gas; infrastructure development; and human capital) as identified in the Uganda Vision 2040. The NDP II aims to mainstream climate change adaptation and mitigation, minimize unplanned urbanization, and continue moving forward in land reforms. It promotes a sustainable population and sustainable use of the environment and natural resources. It recognizes the challenges to the ENR sector (which the ETOA Team has also noted): limited prospects for long-term investments in ecosystem protection and institutional capacity development; low level of awareness and appreciation of the critical linkages between environment and development; increasing demand for natural resources; limited strategic data and information for planning; and continued institutional policy reforms that have made long-term planning challenging.

**National Biodiversity Strategy and Action Plan (NBSAP):** The most recent (March 2015) NBSAP addresses the key concerns regarding biodiversity management in Uganda: Declining species abundance largely due to overharvesting and exploitation of biological resources including trees and woody biomass; and shrinking habitats—for example, wetlands and forests—attributed to unsustainable use of biodiversity resources or habitat loss due to conversion of habitats into other commercial land/water uses or habitat degradation. Significantly, the NBSAP notes socio-economic pressures and their contribution to loss of biodiversity, such as human population increase and political pressures which cause conflicts and insecurity.

The revised NBSAP has seven strategic objectives:

1. To strengthen stakeholder co-ordination and frameworks for biodiversity management.
2. To facilitate and enhance capacity for research, monitoring, information management, and exchange on biodiversity.
3. To put in place measures to reduce and manage negative impacts on biodiversity.
4. To promote the sustainable use and equitable sharing of costs and benefits of biodiversity.
5. To enhance awareness and education on biodiversity issues among the various stakeholders.
6. To harness modern biotechnology for socio-economic development with adequate safety measures for human health and the environment.
7. To promote innovative sustainable funding mechanisms for implementation of NBSAP activities.

Inadequate financing had been cited as one of the factors affecting implementation of the previous NBSAP in Uganda. Therefore, a mechanism to engage relevant GOU institutions, especially Ministry of Finance, Planning and Economic Development, on financial resource allocation was developed during the preparation of the Fifth Report to the COP. To this end, each of the seven strategic objectives is tied to an action plan with a budget; an eighth action plan has also been prepared for critical new and emerging issues of oil and gas discovery and production, biofuel production, and natural disasters. The total cost for implementing the strategy and action plan (2015–2025) is estimated at US\$80 million.

**The NEMA Strategic Plan 2009–2014:** The strategy is premised on enhancement of environmental compliance and enforcement of the environmental law, regulations, and standards; environmental integration and implementation at national and local government levels; increasing access to environmental information, education/awareness, and public participation; strengthening institutional capacity of NEMA to perform its mandate; and enhancing national, regional, and international networking and partnerships for effective environmental management and sustainable development.

**The Wetlands Strategic Plan:** Aims to guide investment and management of wetlands.

**The National Forestry Plan (2013):** The plan provides for sustainable forest management and maintenance of the permanent forest estate. This revision of the 2002 plan is reoriented towards developing forestry-related enterprises, and is in line with the NDP II, which strives for increased investment in forestry within the national budget and donor programs, and through the private sector. This is meant to address the limited funding for forestry programs, which has left many key activities in the 2002 strategic plan unimplemented.

**National Invasive Species Strategy, Action Plan (NISSAP):** The strategy was developed from lessons learned during the GEF-funded project, Removing Barriers to Invasive Plant Management in Africa. The goal of the NISSAP is to guide decision making during national and sectoral planning and gives effect to Article 8 (h) of the CBD, which obliges each contracting party to, as far as possible and appropriate, prevent the introduction, control, or eradication of those invasive species that threaten ecosystems, habitats, or species.

**Agricultural Sector Development Strategy & Investment Plan: 2010/11–2014/15 (Agriculture for Food and Income Security) (DSIP):** The DSIP envisions “a Competitive, Profitable and Sustainable Agricultural Sector.” It specifically aims to implement, at a program level, interventions that seek to enhance production and productivity; market access and value addition; improving the enabling environment for agriculture; and institutional development. Two of these program-level interventions address issues related to land degradation in the agriculture sector.

**District Development Plans (DDP):** The DDP determines common policy goals for the district as well as budget allocations. The plans integrate information from District Environment Action Plans (DEAPs) and District Forest Plans. However, formulation of DEAPs has been inconsistent and in some districts not prepared at all. This limits mainstreaming of ENR and, subsequently, associated budget allocations. USAID/Environmental Monitoring of Oil and Gas in Uganda (EMOS), is supporting development of DEAPs in oil and gas activity areas to strengthen environmental planning at the District level but the sustainability of the DEAP process is questionable; previous donor support for production of DEAPs was not sustained once donor funding ended. One issue is that District Environment Officers and Forest Officers, who have primary responsibility for DEAPs, also have multiple other tasks including EIA reviews, monitoring EIA requirements, collaboration with other district technical staff, participation on Local Environmental Committees, and a policy role of linking environmental objectives to the overall DDP (ETOA consultations with district staff).

**Uganda National Adaptation Programmes of Action (NAPA):** The NAPA identified the immediate adaptation needs for Uganda and spells out strategies for enhancing adaptation to and mitigation of the negative effects of climate change and variability, as follows:

- Community tree growing



- Land degradation management
- Strengthening meteorological services
- Community water and sanitation
- Water for production
- Drought adaptation
- Vectors, pests, and disease control
- Indigenous knowledge
- Natural resources management
- Climate change and development planning

**REDD+ Program:** In Uganda, REDD+ is in the preparation phase; it includes the following: 1) An action plan and budget describing projects aimed at reducing deforestation. 2) Baseline of the status of forestry resources and extent of deforestation and degradation. The baseline will also provide information on Uganda’s future projections for sustainable forest management and drivers of deforestation and degradation. The baseline will give a basis for strategy options for forest rehabilitation. 3) Monitoring system for implementation of the strategy options, which will use land-based and remote sensing tools. 4) Safeguard systems, which will identify the safeguards that will ensure sustainable use of forest resources.

**Lake Victoria Management Program:** This is a transboundary water resources management program coordinated under the Lake Victoria Basin Commission under the Lake Victoria Environment Management Project Phase II (LVEMP II). The LVEMP II has three components: strengthening institutional capacity for managing shared water and fisheries resources, point source pollution control and prevention, and watershed management. The project includes biodiversity targets; for example, targeting biodiversity hot spot wetlands around the lake region (around Lake Nabugabo and Sango bay-Minziro transboundary wetland). Socio-economic assessments have been completed; the next activities include economic valuation of the wetlands.

**Community Forest Management (CFM) Agreements:** According to the Forest Plan 2013, since 1997 when CFM began, it has grown to cover sites in 43 CFRs, involving 85 CFM groups. The process started off sluggishly with only two CFM agreements signed by 2004 (for Budongo and Tororo CFRs). By the end of 2010, 25 CFM agreements had been signed, while 60 were at various stages of development. (At the time the 2011 ETOA was conducted, 26 CFM agreements had been signed.) FBEs, including bee-keeping, craft making, and fruit growing, are in place as income-generating activities (IGAs). However, according to the plan, communities have yet to substantially benefit from implementation of CFM agreements and the Forestry Policy and law are not specific on benefits that should accrue to communities under CFM arrangements.

## *GOVERNMENT INSTITUTIONS*

The main GOU institutions involved in biodiversity and forest conservation are in **Section 5** of the ETOA.

**Ministry of Lands, Housing and Urban Development (MLHUD):** This ministry is responsible for the formulation of national policies, strategies, and programs, as well as initiating, reviewing, and making amendments to existing legislation in the lands, housing, and urban development sub-sectors.

**Ministry of Agriculture Animal Industry and Fisheries (MAAIF):** MAAIF’s mandate derives from the Constitution of the Republic of Uganda, the Local Governments Act 1997, and the Public Service Reform Program (PSRP). Fisheries resources are under the jurisdiction of the MAAIF Department of Fisheries Resources (DFR).

**The National Agricultural Research Organization (NARO):** NARO’s mandate is to coordinate, oversee, and guide agricultural research in Uganda. Under NARO are other semi-autonomous public research

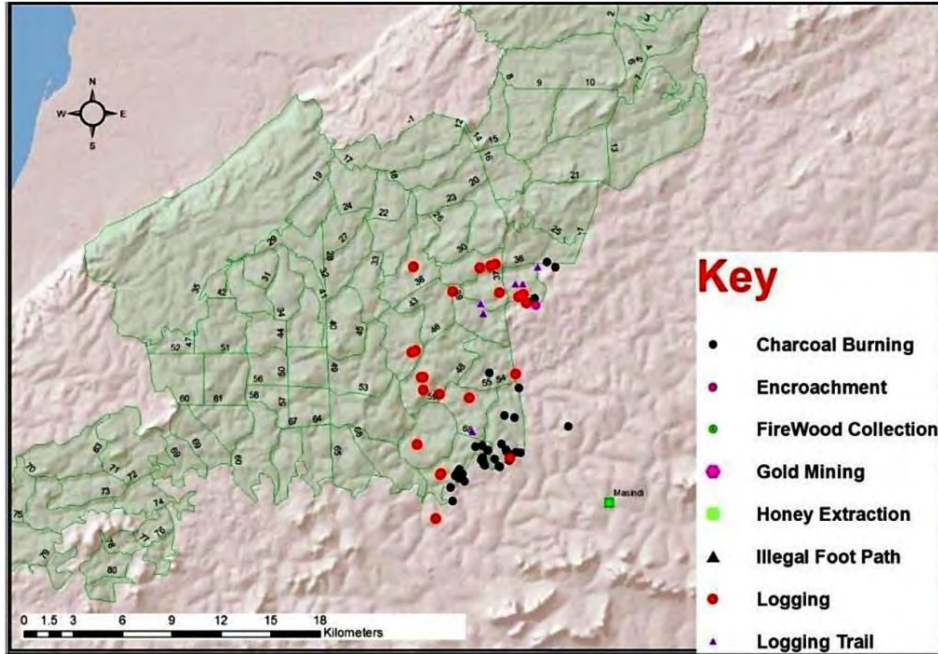
institutes, which include the National Agricultural Research Laboratories, National Crops Resources Research Institute, National Fisheries Resources Research Institute, National Forestry Resources Research Institute, National Livestock Resources Research Institute, National Semi Arid Agricultural Research Institute, and National Coffee Research Institute. NARO has also established research centers in different zones of the country, thereby bringing their services closer to people who need them.

**The Department of Relief, Disaster Preparedness and Management:** This is the lead agency responsible for disaster preparedness and management in Uganda, coordinating risk reduction, prevention, preparedness, mitigation, and response actions on a national scale in consultation with other line ministries, humanitarian and development partners, Local Governments, and the private sector.

**National Council for Science and Technology (UNCST):** UNCST, under the Ministry of Finance Planning and Economic Development, is mandated to facilitate and coordinate the development and implementation of policies and strategies for integrating science and technology into the national development process.

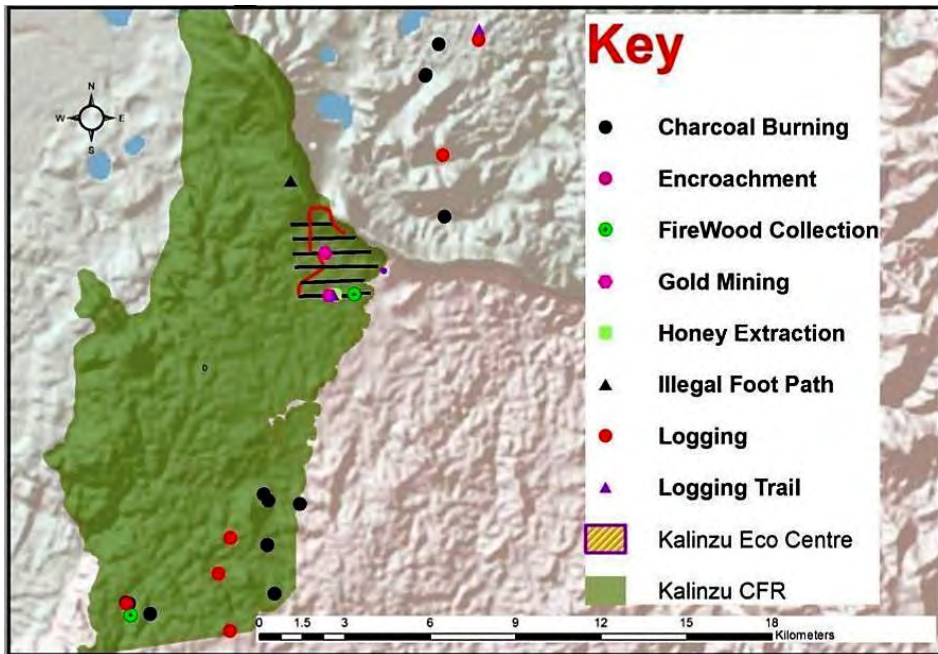
# ANNEX J: ADDITIONAL FIGURES

**Figure 16: Illegal Activities in Budongo CFR**



Source: African Wildlife Foundation (USAID/Uganda Biodiversity Program)

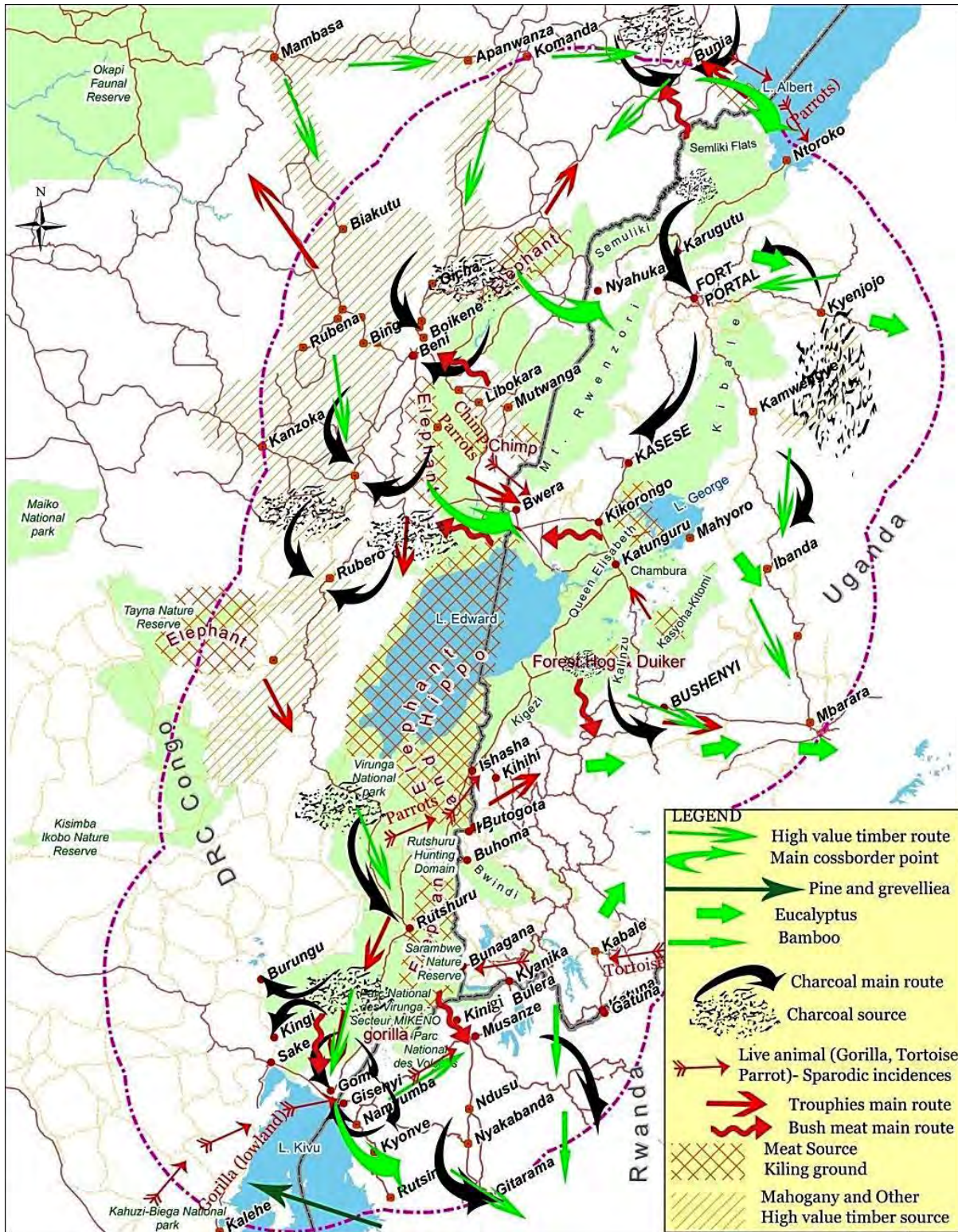
**Figure 17: Illegal Activities in Kalinzu CFR**



Source: African Wildlife Foundation (USAID/Uganda Biodiversity Program)



**Figure 18: Major Routes of Illegal Timber, Charcoal, and Wildlife Trade Across Borders within the Greater Virunga Landscape**



Source: Mapesa, M., Kyampaire, O., Begumana, J., Bemigisha, J., 2013. Extent of Illegal Timber, Charcoal, and Wildlife Trade in the Greater Virunga Landscape. Report prepared for the Wild Wide Fund of Nature, Kampala, Uganda.

## ANNEX K: CLIMATE CHANGE: INDIRECT EFFECTS ON BIODIVERSITY

Rainfall has decreased and become more unreliable and less evenly distributed. Recent years have seen erratic arrivals and endings of rainfall seasons, and individual rainfalls have been heavier and more violent. Floods and landslides are on the rise and are increasing in intensity. Since 2000, extreme rainfall conditions have been regularly experienced in eastern Uganda, which had an increase of approximately 1,500 mm of precipitation in the December to January rainy season. El Niño–Southern Oscillation events have also become shorter and more irregular. These trends are considered drivers, and in some cases, they enhance some of the threats outlined in **Section 6** of this report.

Uganda has formulated a new policy on climate change (MWE, 2015), with emphasis on a climate change-resilient and low-carbon pathway. This is to respond to the rising average temperature of 0.28°C per decade in the country between 1960 and 2010. The changing temperature patterns in Uganda have been linked to prolonged droughts of increasing frequency, especially in the western, northern, and northeastern regions, with the most affected region being Karamoja. Since agriculture may be less productive, farmers may expand agricultural land into natural ecosystems. (Alternatively, they may abandon agriculture and move to urban areas, or they may fall farther into poverty.)

### ECONOMIC IMPACTS

Regional studies (e.g., PACJA, 2009, cited in MWE, 2015) have shown significant impacts of climate change on African economies including Uganda. The estimated cost is equal to the annual loss in GDP of 1.5–3 percent by 2030 under a business-as-usual scenario, and the costs could rise to almost 10 percent of GDP by 2100. The estimated climate change economic impacts on the Lake Victoria region for three sectors is presented in **Table 16** below.

**Table 16: Maximum Change in Value Due to Climate Change Between Now and 2050**

Sector	Maximum change in value (constant thousand \$US)
Crops	-\$1,462,686
Livestock	-\$90,942
Health	-\$10,291,811

Source: Hecht, Kahata & Vincent, 2011, cited in Uganda National Climate Change Policy 2014

For Uganda, the main policy-level concern is the impact of climate change on microeconomic stability, which is illustrated by the decreasing performance of Uganda’s agricultural sector, the mainstay of the economy. This is likely to result in higher food prices, lower domestic revenues, and an increase in the current deficit due to lower export earnings. For example, agriculture growth dropped from 1.5 percent in 2004–05 to 0.4 percent in 2005–06 due to prolonged drought conditions experienced in most parts of the country, which affected both cash- and food-crop production. The likely overall impact is an increase in inflation (due to an increasing fiscal deficit), an increase in external debt, and a depreciation of the Ugandan shilling. Since ENR is not a priority sector, the main implication is that in the event of a fiscal deficit, the sector is bound to realize reduced financial allocations.

## **CLIMATE CHANGE RESILIENCE IN KEY SECTORS OF PRODUCTION AND IMPLICATIONS TO LIVELIHOODS AND INCREMENTAL COSTS TO THE SECTORS**

Like at the micro-economic level, impacts of climate change on livelihoods in Uganda are mostly in the agricultural sector. A USAID vulnerability study (USAID, 2013) focusing on how projected changes in climate will affect important agricultural value chains within Uganda, also established the multiplier effect on livelihoods of those villagers who rely upon these value chains. Stresses associated with climate change manifest where farming households may experience an increase in climate events followed by a gradual erosion of productivity that will eventually result in failed harvests or in cases where severe storms (i.e., events characterized by high winds, hail, and heavy rainfall) may wipe out crops, destroy trees, damage or destroy structures, and induce flooding. The most vulnerable households will suffer most from these impacts (the measure of sensitivity) and are less able to rebound over time (the measure of adaptive capacity). Significant non-climate related stressors—such as declining soil fertility, conflict, land and population pressure—combined with climate stressors, will exacerbate the inability of households and communities to respond to climate-induced changes and events, thus reducing their resilience.

Other key production sectors that tend to be most affected by climate and weather variability are water, energy, and transport. The high frequency of droughts has persisted since 2000, and Uganda particularly suffered in 2004/05, when production of hydroelectricity declined substantially, throwing the country into a power crisis that undermined investment and slowed the country's economic growth. Evidence of the impact of drought on water resources is clear. Any decrease in the water level of Lake Victoria is reflected in the hydroelectricity supplies produced by the two dams—Nalubale and Kiira—located downstream. Declining water levels also affect fisheries resources due to impacts on fish-breeding sites and fish habitat in general.

As the productivity of agriculture, forestry, and fisheries decreases, people increasingly migrate to urban areas and fragile ecosystems. In the 2007–08 fiscal year, climate change damages were equivalent to 4.4 percent of the national budget. The cost of the damage exceeded the 3.3 percent budget allocation for the ENR sector, which is already underfunded. In such events, ENR sectors have challenges accessing funds for incremental costs (additional costs to the sectors for climate change interventions) because climate change indicators that are supposed to quantify the additional costs have not been developed and integrated in the Output Budget Tool (OBT) within the Ministry of Finance. Vulnerability assessments are required in the ENR sector to provide information that may be needed in the climate change indicator development process.

### **CONCLUSION**

There are links between climate change resilience and financial loss in the different sectors that also influence biodiversity conservation, ENR, and related sectors. However, systematic monitoring and assessment of the impacts is required to inform government and partners on incremental costs and strategies for resilience.



# **ANNEX L: UGANDA'S PROPOSED RED LIST OF THREATENED SPECIES**

**Table 17: Proposed National Redlist for Uganda: Evaluated Plant Species**

Proposed National Redlist for Uganda: Evaluated Plant Species													
COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
	Hydrocharitaceae	Lagarosiphon	ilicifolius	LC ver 3.1	VU D2	Bukoba district in Lake Victoria - one of Ssese islands	Small	Aquatic herb in open areas	Small population which is unprotected	Not sure	none	Need to urgently understand status	Confined to a small area on one island in Lake Victoria. Widespread elsewhere but VU in Uganda because of one location and small population - however, if in decline could easily be reclassified as CR (B1+2) so urgent need to understand status.
	Arecaceae	Calamus	deerratus	NE	VU B2ab(i,ii)	Semuliki National Park, Mt. Kei Forest Reserve, Budongo Forest Reserve, Bugoma Forest Reserve, Maramagambo Forest Reserve, Mabira Forest Reserve	5%	Rainforest	Overharvesting and habitat degradation	declining	Protected area - many FR's not well-protected.	regulate harvesting, domestication	AOO of rainforest in protected areas where it occurs is nominally 2053km <sup>2</sup> , however part of these PA's have been seriously degraded, thus its real current AOO is less than 2000km, and degradation continuing.
Leopard Orchid, Monkey Sugarcane, African Ansellia, Mopane Orchid, Tree Orchid	Orchidaceae	Ansellia	africana	VU A2cd+3cd+4cd	VU A2cd	Mt Elgon National Park, Bugoma Forest Reserve, Budongo Forest Reserve, and Matheniko Bukoro Wildlife Reserve (near Moroto town)	At least 5%	Widespread in dry mixed deciduous woodlands, usually near rivers in tree canopy, most often at lower altitudes	Trade and medicinal use across Africa	Declining because of deforestation	Protected areas	Strengthen protection of forest reserves, and conduct surveys. Sensitization of the forest management	Restricted distribution and habitat degradation (Makerere herbarium records indicate that it was recorded in Elgon NP in 1924, and Matheniko near Moroto town in 1968, but likely no longer to occur in these habitats). Due to observed habitat degradation, known harvesting and reduction in AOO, loss of >30% suspected.
	Orchidaceae	Disperis	aphylla	NE	VUD2	Bunyoro (historical record from Budongo Forest Reserve), and Toro	20%	Leaf-litter in dense evergreen forest. 360-1530m	Deforestation and degradation, clearance of leaf mulch for agriculture	Declining	some areas are protected e.g. Kibale NP	Strengthen the protection of forests and survey for current AOO	Miniature orchid, more surveys very much needed. Appears to have reduced distribution and appears to be rarely recorded in more recent times.
	Xanthorrhoeaceae	Aloe	schweinfurthii	LC ver 3.1	VU A2c,d	Budongo Forest Reserve and Matiri Forest Reserve, locations in northwest Uganda	Very small	Bushed grassland and rocky slopes,	Affected by conversion to agriculture, settlement and fire and through medicinal harvesting	Declining	protected areas	Collecting seeds for storage in the seedbank	All Aloes threatened by harvesting for medicinal values due to ignorance about the right species. Also threatened through habitat degradation, especially outside PA's and so a loss of 30% (past and continuing) is suspected.
	Xanthorrhoeaceae	Aloe	tororoana	VU D2	CR B1ab(iii)	Known from four collections from two sites on Tororo Rock in southeastern Uganda, altitudes between 1,350 and 1,890 m asl	100%	Rocky outcrops	The southern subpopulation on Tororo Rock threatened by construction, road-building, mining, urbanisation, cultivation and tourism.	Decline	locally protected by the district authorities	Need to protect rock, collect seeds for the Uganda National Gene bank, Kew Millennium seedbank	Conditions at Tororo Rock have improved somewhat, but we still infer a past and continuing decline in the quality of the habitat (Dr Kabuye assessment) and the EOO smaller than 100km <sup>2</sup> with severely fragmented subpopulations. The most recent collection is from 2000.
	Xanthorrhoeaceae	Aloe	volkensii	LC ver 3.1	VU A2cd	Mt Moroto National Park, Matiri Forest Reserve, small forest remnants on Kampala to Fort Portal road (Mubende area), Labwor Hills and Napak District	Small	Bushed grassland and rocky slopes,	Affected by conversion to agriculture and fire	Declining as a result of agricultural expansion	none	reduce harvesting for medicinal purposes, protection of the populations	Not commonly encountered in the wild and mainly outside PA's so particularly vulnerable. Very rapid habitat clearance is being carried out in all parts of its range. Also specifically harvested for medicinal values. Expert opinion suspects that the rate of habitat conversion means that this species is declining at an equally rapid rate of >30% in three generations
	Compositae	Bothriocline	auriculata	CR B1ab(iii)+2ab(iii)	CR B1+2ab(i,ii,iii,iv)	Mt Elgon National Park	100%	Montane forests and bamboo thickets	Affected by human activities, habitat degradation	Declining	Protected	Continued protection and halt human impacts such as trampling. Occurs in areas	Altitude above 2700m (Only known from 3 localities on Mt Elgon, records from 1918, 1930 and 1997). Extremely limited AOO/EOO and threats continuing.

Proposed National Redlist for Uganda: Evaluated Plant Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
	Compositae	Brachylaela	huillensis	NT ver 2.3	CR D1	Nile Bank Forest Reserve and South Busoga Forest Reserve, Mengo Forests, Murchison Falls National Park	?	Tree in rainforest	Forest cleared for agriculture on Nile bank and South Busoga	Declining	None	vulnerable to landslides Study current AOO and halt forest loss in FRs where this species found to still occur.	The species is believed to be very rare or extinct from the wild. Very small population known to have existed in Nile bank forest reserve. The forest was cleared and replaced by Pine plantation Estimated that there are less than 50 mature individuals left in Uganda as both FR where it was present have been almost completely converted to agriculture
	Compositae	Helichrysum	formosissimum	DD ver 3.1	EN B2ab(ii)	Bwindi Impenetrable National Park, Rwenzori Mt National Park, Echuya Forest Reserve	small	High altitude everlasting flower in alpine habitat 1800-4350m	Small isolated populations at high altitudes - climate change will affect them	Declining	In Parks protected	Survey to determine distribution	Confined to high altitude habitat in small areas of alpine moorland. Restricted range that is shrinking with climate change. Inferred decline in numbers over time as a result. PA total area is 1352km <sup>2</sup> but the area of moorland where this plant persists is only a small fraction of the PA's and is estimated at much less than 500km <sup>2</sup> . Conditions at this site have improved somewhat, but we still infer a past and continuing decline in the quality of the habitat.
	Compositae	Mikania	microptera		EN B1ab(i,ii,iii,iv)	Kibale National Park and Entebbe Municipality	2%	rainforest	habitat change driven by elephants and human activities	Declining	protected areas	Strengthen conservation of the protected area and survey for current AOO/EOO	Restricted distribution. Entebbe habitat is now urbanised and this plant not expected to persist, so may only occur now in Kibale
	Compositae	Mikaniopsis	vitalba	VU B2ab(iii) Ver 2.3	CR B1,B2ab(i,ii,iii,v)	Entebbe (1905,1915), Mubwindi swamp (1989),	Small	Lowland gallery forest, swamp	harvesting for fibers/ropes, and medicinal values	Not sure	Protected in Bwindi	Maintain conservation status of the habitat	Likely to have been eradicated in Entebbe and being harvested for fibres/ropes in remaining area and has not been recently observed so status expected to be critical and the area in which it occurs is less than 2km <sup>2</sup>
	Compositae	Senecio	navugabensis	CR(PE) B2ab(iii) Ver 3.1	CR/RE	Masaka District (Nabugabo)	100%	grassland	agriculture and settlement	Not sure	none	Survey distribution	Only one known location converted to a military base. Probably now extinct and needs urgent survey
	Compositae	Solanecio	gynuroides	VU D2 Ver 3.1	VU D2	1 site only - Ishasha Gorge	100%	riverine forest		Not sure	protected area	Maintain conservation status of the habitat. Survey for current AOO	Restricted distribution within one site less than 5km. Should be CR but no evidence of current threats although it is likely to have lost much of its AOO since it was collected in 1947 and could even be RE
Drum Tree, West African Cordia	Boraginaceae	Cordia	millenii	LC ver 2.3	EN A2ad	Semuliki National Park, Kibale National Park, Bwindi National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Itwara Forest Reserve, Kasyoha Kitomi Forest Reserve, Kalinzu Forest Reserve, Maramagambo Forest Reserve	Small	Rainforest	Cut to provide timber for boats on Lake Albert	Declining drastically	In FR partially protected	Need to limit harvesting licences	Heavily harvested in past 10 years from Budongo and Bugoma for canoes. Estimated 50% decline in population as a result in past 20 years
	Amaranthaceae	Psilotrichum	axilliflorum	VU D2 ver 3.1	VU B1ac(iii)	Queen Elizabeth National Park, Budongo Forest Reserve, Bugungu Wildlife Reserve, Lake Mburo National Park (July 2014, Protase Rwaburindore, Missouri Botanical Garden, Bunyoro (1972)	20%	Known as being a perennial shrub found in dry or flooded primary forest, but in Uganda is commonly found in thickets in woody savanna areas which is likely due to fire frequency	charcoal burning, grazing, fires	Declining	inside and outside protected areas	Survey EOO/AOO, status and abundance	Previously thought to be endemic to DRC but has been recorded in a number of savanna parks in the Albertine Graben. WCS recorded it in Kaiso Tonya in 2015, otherwise recorded from very few locations. Appears to be seriously at risk from excessive burning in the area where it occurs. Likely to be upgraded if more information available.
Waterwheel, Common Aldrovanda	Droseraceae	Aldrovanda	vesiculosa	EN B2ab(iii,v)	EN B2ab(iii,v)	Known from 3 locations according to herbarium data (Mabamba swamp, swamp adjacent L. Ajama close to Kumi tow), Kirumba)	Small	Aquatic herb in wetlands	Wetland encroachment	Declining as a result of encroachment	Not protected	Protect wetlands	Known from only 3 sites which are all threatened from clearance and conversion. Most current record at Mabamba swamp
	Zamiaceae	Encephalartos	equatorialis	CR B1ab(ii,iii,v)+2ab(ii,iii,v); C1	CR B1+2ab(ii,iii,v)	Mayuge District, Busoga sub-region	100	one rocky outcrop	habitat degradation from fires and grazing	Declining as a result of encroachment	Not protected	Ex-situ conservation and seed collection for seedbank. Negotiation with single landowner to conserve species.	Only known location suffering from habitat destruction. Needs negotiation with the single land owner

Proposed National Redlist for Uganda: Evaluated Plant Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
												Investigate cause for restricted population	
	Zamiaceae	Encephalartos	macrostrabilus	EN B1ab(iii,iv,v); C2a(i)	EN B1+2ab(iii,iv,v)	Acholi sub-region, West Nile sub-region, & East Madi Wildlife Reserve	100	wooded grassland on sandy lithosols with rock slopes along seasonal watercourses	habitat degradation from fires and grazing	Declining as a result of encroachment	Not protected	Ex-situ conservation and seed collection for seedbank. Awareness raising of local communities, authorities	Few locations not protected and habitat degradation. Not likely to persist without protection
	Zamiaceae	Encephalartos	septentrionalis	NT ver 3.1	EN B1+2ab(ii,iii)	Acholi sub-region, West Nile sub-region, & East Madi Wildlife Reserve	10	Woodland and riverine forest	Illegal harvesting for horticulture for international trade, burning, habitat destruction due to agricultural expansion and grazing	Declining	Not in protected areas	Ex-situ conservation and seed collection for seedbank. Awareness raising of local communities, authorities	Few locations not protected and habitat degradation
	Zamiaceae	Encephalartos	whitelockii	CR B1ab(ii,iii,v)+2ab(ii,iii,v)	CR B2ab(ii,iii,iv,v)	Mpanga River falls-Kabarole District	100	almost sheer granite faces and on rocky slopes, amongst tall grass in grassland	site development and illegal collection for horticulture	Declining	Not in protected area	Ex-situ conservation and seed collection for seedbank. Awareness raising of local communities, authorities	Single location only, very restricted AOO, EOO and has been threatened by development of hydropower projects on single site where it occurs
	Dipsacaceae	Dipsacus	kigeziensis	NE	DD	Mgahinga National Park, Kigezi District	90%	montane open grassland	habitat degradation	Not sure	protected area	Survey distribution	Restricted distribution. Only one collection in 1924 in Kigezi and unresolved. Revisit its taxonomic status
	Ebenaceae	Diospyros	katendei	CR (PE) B1ab(iii)+2ab(iii)	CR/RE	Kasyoha-Kitomi Forest Reserve	100%	Tropical high forest	only known individual cut down		none	Survey distribution	No longer found in Kasyoha Kitomi, the only known location. Urgently need to understand status and whether in fact RE.
	Lecythidaceae	Brazzeia	longipedicellata	EN B1+2c Ver. 2.3	EN B2ab(iii,v)	Bwindi Impenetrable National Park (Ishasha Gorge), Budongo Forest Reserve	At least 50%	Tree/shrub in forest	Isolated individuals and threats unclear	Presume decline	Somewhat protected in parks, degradation in forest reserves is occurring rapidly	Need a targeted survey to identify AOO, abundance, seed production and germination success.	In very low numbers where it occurs and less than 1000 mature individuals in either Bwindi or Budongo. Recorded only in Bwindi in the most recent surveys. Listed as endangered globally by Makerere University in 1998 and its situation has not improved and numbers believed to have declined. Protected area of forest 791km <sup>2</sup> but actual AOO much lower, certainly less than 500km <sup>2</sup> and could be critical.
	Sapotaceae	Chrysophyllum	albidum	NE	VU A2acd	Semuliki National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kasyoha Kitomi Forest Reserve, Kalinzu Maramagambo Forest Reserve, Mabira Forest Reserve, Sango Bay Forest Reserve, South Busoga Forest Reserve, Luuka District, East Madi Wildlife Reserve, Mbale Municipality	50%	Lowland rainforest and riverine forest	Harvested for Timber, habitat conversion and degradation	Declining drastically, yet most Mature trees lost and don't fruit until 30 cm DBH	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Control harvesting of species and protect core areas. Need index of abundance	Intense harvesting has led to at least a 40% loss of population in forests in Uganda in past 80 years, based on occurrence records and potential AOO. Many of the areas where this plant previously occurred have been totally converted to agriculture or plantations. Most probably EN, but nominally AOO to high to support this.
	Sapotaceae	Chrysophyllum	muerensae	NE	VU A2acd	Semuliki National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kasyoha Kitomi Forest Reserve, Kalinzu Maramagambo Forest Reserve, Mabira Forest Reserve	30%	Rainforest species	Harvested for Timber	Declining drastically, yet most Mature trees lost and don't fruit until 30 cm DBH	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Control harvesting of species	Species has declined greatly due to current heavy harvesting for timber, due to loss of preferred timber trees. Restricted range and low density in AR forests
	Sapotaceae	Chrysophyllum	perpulchrum	NE	VU A2ad; B2b(i,ii,iii,iv)	Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kasyoha Kitomi Forest Reserve, Kalinzu Forest Reserve, Mengo District (Kisitu Forest - Byeya CFR)	30%	Rainforest species	Harvested for Timber	Declining drastically throughout Uganda - most Mature trees lost	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Control harvesting of species	Intense harvesting for timber has led to at least a 30% loss of population in forests in Uganda in past 60 years. Total AOO 1732km <sup>2</sup> although unlikely to occupy all of this area

Proposed National Redlist for Uganda: Evaluated Plant Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
	Sapotaceae	Pouteria	altissima	LC Ver 2.3	LC	Kibale National Park, Bwindi Impenetrable National Park, Semuliki National Park, Rwenzori Mt National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kalinzu Maramagambo Forest Reserve, Kasyoha Kitomi Forest Reserve, Itwara Forest Reserve	10%	Rainforest and lakeshore forest	Harvested for Timber	Declining throughout Uganda	Some protection in parks and forest reserves	monitor the harvesting	Species not targeted as heavily for timber, but harvested whenever encountered and some loss due to clearance, thus, assessed as LC because it is widespread and relatively abundant
Shea Butter Tree	Sapotaceae	Vitellaria	paradoxa	VU A1cd Ver 2.3	VU A2ad	Northern Uganda, Lira and Kitgum Districts	small	Woodland tree	Harvested for fruits to make Shea butter and also for charcoal	Declining as mainly outside protected areas	none	Stop harvesting of species for charcoal and encourage sustainable Shea butter production	Estimated that at least 30% of the trees in northern Uganda have been cleared for charcoal and agriculture in past 30 years
	Leguminosae	Aeschynomene	indica	LC ver 3.1	VU D1	Semuliki National Park and Virunga Volcanoes	Small	Shrub	Very small populations in Uganda	Not sure	protected in parks		While widely distributed and common elsewhere this species is rare in Uganda and only known from two locations - likely fewer than 1000 mature individuals
Afzelia	Leguminosae	Afzelia	africana	VU A1d Ver 2.3	EN B2ab(i,ii,iii,iv)	West Nile sub-region, Kitgum District and Murchison Falls National Park	<5%	wooded grassland across sahelian region	Harvesting for charcoal and carvings in West Nile	Declining in West Nile	Protected in MFNP and possibly Ajai	Control harvesting for carvings and act against unsustainable charcoal production	Species has declined dramatically in West Nile in recent years because of charcoal and carvings for tourist market. Now restricted to three locations with ongoing threats
	Leguminosae	Afzelia	bipindensis	VU A1cd Ver. 2.3	VU B2ab(iii,iv,v)	Semuliki National Park, Bugoma Forest Reserve	<5%	Lowland rainforest species	Harvesting for timber	Probably declining because of harvesting	Protected in Semuliki NP and to some extent in Bugoma	Control harvesting of the species	Species is rarely seen and is harvested for timber - likely to be small population in Uganda with only two sites noted in WCS surveys and no other records. Suspected to be very rare, yet still harvested for timber.
	Leguminosae	Albizia	coriaria	NE	NT	U1 excluding Karamoja, U2, U3 excluding all high alt, & U4	10%	Woodland species and forest edge	Targeted for charcoal and timber	Declining across its range in Uganda	Some protection in FRs and more in Parks	Control harvesting of species, education and awareness raising	Widely distributed, although mature individuals have reduced significantly due to intensive timber and charcoal harvesting - hence NT status
Albizia	Leguminosae	Albizia	ferruginea	VU A1cd Ver. 2.3	EN A2acd	Murchison Falls National Park, Kibale National Park, Semuliki National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kasyoha Kitomi Forest Reserve, Itwara Forest Reserve, Zoka Forest, Mabira Forest Reserve	30%	Rainforest species	Harvested for Timber	Declining where it occurs in Uganda	Some protection in parks	Control harvesting of species	Species is rarely encountered in forests where harvesting has been allowed (e.g. Bugoma where it used to be abundant) and is now rare in Uganda. Suspected rate of decline of more than 50%
	Leguminosae	Cordyla	richardii	VU B1+2c Ver 2.3	VU B2ab(iii,iv)	East Madi Wildlife Reserve, Mt Kadam, Mt Otzi, Timu Forest, Kaabong District	30%	deciduous woodland on rocky hill sites, riverine forests	habitat degradation, agriculture expansion, fires	Presume decline	protected areas	halt habitat degradation and loss, awareness raising for continued protection	habitat degradation, woodland conversion to agriculture
African Blackwood, Mozambique Ebony	Leguminosae	Dalbergia	melanoxylon	NT ver 2.3	VU A2ad	Kidepo Valley National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Maramagambo Forest Reserve, West Nile sub-region	Small	Woodland tree	Harvested for carvings - african black wood and threatened by fire from agriculture	Declining as a result of harvesting and fire	In FR partially protected	Reduce harvesting for carvings and investigate cause of trees dying in MFNP and Bugungu with possibility of gaining better control of fires.	Probably declined by more than 30% because of harvesting for carving and fires outside protected areas in West Nile and northern Uganda. Many trees dying in woodlands in Bugungu and MFNP (probably fire-related)
	Leguminosae	Dialium	excelsum	EN B1+2c Ver 2.3	VU A2acd	Semuliki National Park, Kibale National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kasyoha Kitomi Forest Reserve, Itwara Forest Reserve	10%	rainforest and riversides at 760-900 m asl	Timber harvesting, habitat degradation	Declining	protected areas	Strengthen law enforcement, halt harvesting for timber	Relatively low populations wherever it occurs
	Leguminosae	Erythrophloeum	suaveolens	NE	VU A2ad	Budongo Forest Reserve, Bugoma Forest Reserve, Bunyoro sub-region, Mengo Municipality	Small	Rainforest tree in Uganda, rare where it occurs	Harvested for Timber	Declining drastically throughout Uganda - most Mature trees lost	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Control harvesting of species	Species has declined due to heavy harvesting for timber, leading to at least a 30% loss of population in forests in Uganda in past 60 years
	Leguminosae	Millettia	lacus-alberti	VU B1+2c Ver. 2.3	CR B1+2ab(i,ii,iii,iv)	Waki River in Siba block, Budongo Forest Reserve - only record known	30%	Riverine forest liana	woody liana and cut during timber harvesting	Very rare and small population	none	Survey distribution	Only known from Waki river in Siba block Budongo. Forest degradation from timber harvesting likely leading to declines in this species. Very rarely seen and inferred Critically endangered (Site record by David Nkuutu has



Proposed National Redlist for Uganda: Evaluated Plant Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
													coordinates and a photo)
	Leguminosae	Tamarindus	indica		VU A2acd	Karamoja Region, Busoga sub-region, Bunyoro sub-region, Mengo District, Kabarole District West Nile sub-region, East Madi Wildlife Reserve, Acholi sub-region	2%	Woodland tree rarely encountered	Harvested for charcoal and land conversion	Declining from charcoal industry	Culturally protected	Stop harvesting and encourage cultivation for fruits, carry out surveys to acquire information on trends and abundance and key sites	Species declining from charcoal burning
	Apocynaceae	Holarrhena	floribunda	LC ver 3.1	CR D	Only known from Budongo Forest Reserve and Kaniyo- Pabidi Forest Reserve	Small	Shrub/small tree from forest edge	Small population in Uganda	Presume decline	Should be protected in FRs, but this is a forest edge species and the forests are being degraded, with edge areas most affected.	Urgently survey AOO in Uganda and protect sites where it remains	Only one mature tree recorded from Kaniyo-Pabidi Forest reserve. Very low numbers known in Uganda - could be EN if more mature individuals are found but because little known have got to presume CR as extinction risk very high.
	Apocynaceae	Mondia	whitei	NE	VU A2acd	Kibale National Park, Semuliki National Park, Rwenzori Mt National Park, Bwindi Impenetrable National Park, Mabira Forest Reserve, Budongo Forest Reserve, Bugoma Forest Reserve, Itwara Forest Reserve, Kasyoha Kitomi Forest Reserve, Kalinzu Forest Reserve	10%	rainforest	root harvesting for medicinal purposes and habitat degradation	declining	protected areas	Maintain conservation status of the habitat	
	Apocynaceae	Secamone	racemosa	VU A2c Ver 3.1	LC	Rwenzori Mt National Park, Mgahinga National Park, Kalinzu Forest Reserve, Kasyoha Kitomi Forest Reserve, Echuya Forest Reserve, Budongo Forest Reserve	10%	lowland to montane forests	habitat degradation	Stable	protected area	Maintain conservation status of the habitat	
	Rubiaceae	Fleroyia	stipulosa	VU A1cd Ver 2.3	VU B2ab(ii,iii,iv,v)	Rwenzori Mt National Park, Kalinzu Forest Reserve, Maramagambo Forest Reserve, Mabira Forest Reserve, Kasyoha Kitomi Forest Reserve, Mpanga Forest Reserve, Zika Forest Reserve, Mpigi Forest Reserve, South Busoga Forest Reserve, Zoka Forest Reserve, Namwaasa Forest Reserve, Bwesigoola Forest Reserve, Taala Forest Reserve,	5%	Lowland evergreen forest, swamp forests	timber harvesting, wetland degradation	Declining	inside and outside protected areas	active conservation of wetlands, halt overharvesting for timber, domestication	Wetland edge species, which has been heavily cultivated and good for timber. The AOO is close to 200km <sup>2</sup> , however, many of these forests are almost entirely converted or degraded and this species is unlikely to persist at these sites.
	Rubiaceae	Nauclea	diderrichii	VU A1cd Ver 2.3	VU D2	Semuliki National Park, Kasyoha Kitomi Forest Reserve, Budongo Forest Reserve	>5%	Tropical rainforest	harvesting for timber, habitat degradation	Declining	protected area, but in a utilization zone in Budongo	Should be added to NFA's list of species of high conservation concern	Restricted locations in 3 sites.
	Rubiaceae	Pavetta	ankolensis	NE	EN B2ab(i,ii)	Ankole sub-region	30%	wooded grassland	Grazing, charcoal production, and habitat degradation	Declining	outside protected areas	Survey distribution	Restricted distribution, very low populations, AR endemic. Confirm existence in the area
	Rubiaceae	Pavetta	intermedia	VU B1+2c Ver 2.3	CR B1+2ab(iv)	Kibale National Park (1935/55)	50%	forest	Forest clearing during logging and trail making	Not sure	protected area	Ex-situ conservation and seed collection for seedbank. Survey for current potential AOO	Restricted distribution, last collection in 1955, so likely that this plant is under threat of regional extinction. Resources needed to undertake full targetted survey to locate this species.
	Rubiaceae	Psychotria	minuta	NE	CR D1	Single site-Maramagambo Forest Reserve	10%	rainforest	habitat degradation	Not sure	protected area	Strengthen law enforcement, halt harvesting for timber	Very small and restricted population, only recorded from Maramagambo Forest, although this is well protected.
	Rubiaceae	Sabicea	entebbensis	NE	EN B2ab(i,ii,iii)	Entebbe (Kitubulu Forest), Sango bay (near Katera), Kyagwe (Nakiza Forest), and Bugala-Sesse Islands	100%	Forest edge and associated thickets	Settlement and urban sprawl (in Entebbe), forest clearing	Declining	Not protected	More surveys	Last collection in 1972 from 2-3 km N of Katera and also in 1969 from 1.5 km NE of Nansagazi (Kyagwe). This species has a restricted distribution and has suffered from habitat degradation or conversion in all forests where it



Proposed National Redlist for Uganda: Evaluated Plant Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
													occurs with almost no remaining habitat.
	Lauraceae	Beilschmiedia	ugandensis	VU A2d Ver. 2.3	NT	Mabira Forest Reserve, Albertine Rift forests from Budongo to Kalinzu/Maramagambo and Rwenzori National Park	Small	Rainforest shrub/tree harvested for timber - often in swampy places between 900-1500 metres	Harvested for timber and is now rare -	Declining because of being harvested for timber - only juveniles seen recently in forests	Protected in FRs, better in parks	Stop harvest of species in FRs	Wide distribution inside protected areas. Hamilton recorded it as most abundant tree in Mabira Forest in 1970s but hardly seen now, but common in Bwindi, KK, Kalinzu,
	Lauraceae	Ocotea	kenyensis	VU A1cd Ver 2.3	VU D2	Bwindi Impenetrable National Park	<5%	tropical high forest	habitat degradation	small	protected area	Maintain conservation status of the habitat	
CR (PE)?	Dioscoreaceae	Dioscorea	baya		CR/RE	Mengo Kipayo (1914), Nambigirwa forest near Entebbe 1932, Kajjansi forest 1938)	<5%	forests	Habitat loss - settlement and urban sprawl	Declining possibly to extinction	Not protected	detailed surveys, ex situ conservation, if not extinct	All of the forests where it was formerly recorded are now converted through urban development
	Dioscoreaceae	Dioscorea	praeensis		NT	Bwindi Impenetrable National Park, Kibale National Park, Mgahinga National Park, Bugoma Forest Reserve, Kasyoha Kitomi Forest Reserve, Budongo Forest Reserve, Kalinzu Forest Reserve	10%	rainforest	harvest for food, habitat degradation	Not sure	inside and outside protected areas and	domestication, surveys	
	Annonaceae	Uvariandra	magnificum	EN B1ab(ii,iii,v)+2ab(ii,iii,v) Ver 3.1	VU B2ab(ii,iii,iv,v)	Bwindi Impenetrable National Park, Budongo Forest Reserve, Kasyoha Kitomi Forest Reserve, Maramagambo Forest Reserve, Ssesse Islands	90%	rainforest	habitat degradation, palm establishment in Ssesse Island	declining	inside and outside protected areas	Maintain conservation status of the habitat	Threatened by human activities, especially on Ssesse Islands were most of forest habitat has been cleared or converted.
	Canellaceae	Warburgia	ugandensis	NE	VU A2ad	Kibale National Park, Semuliki National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kalinzu Forest Reserve, Kasyoha Kitomi Forest Reserve, Itwara Forest Reserve, Maramagambo Forest Reserve, Mabira Forest Reserve, South Busoga Forest Reserve, Karamoja sub-region	30%	Rainforest, dry and moist woodlands	Harvested for Timber and medicinal purposes	Declining due to harvesting for timber and medicine benefits	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	intensify domestication	Species declining from harvesting for both timber and from bark harvesting for medicinal purposes
	Clusiaceae	Allanblackia	kimbiliensis		VU D2	Ishasha gorge (Bwindi Impenetrable National Park)	50%	rainforest	Unknown	Not sure	protected area	Maintain conservation status of the habitat	restricted distribution and only in one location
	Euphorbiaceae	Euphorbia	bwamensis	VU B1+2c Ver 2.3	VU D2	Semuliki National Park	50	Cynometra forest	trampling by elephants	Stable	protected area	Need to understand abundance and status. Recommend ex-situ conservation	Known from single forest on border of DRC (Ituri) and Uganda (Semliki). Could be more endangered but needs estimate of abundance and more knowledge regarding its status
	Irvingiaceae	Irvingia	gabonensis	NT ver 2.3	EN A2ad	Semuliki National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Itwara Forest Reserve, Mengo District	Small	Rainforest tree	Harvested for timber leading to reduced numbers	Declining	Semi protected in FRs	Protect core habitat and ensure this species is not harvested	Declined greatly due to harvesting for timber from 1960s. Estimated that there has been about a 70% reduction in this species in Uganda - not harvested much now because very rare
	Passifloraceae	Efulensia	montana		VU B2ab(iii,iv)	Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kalinzu Forest Reserve	50%	rainforest	habitat degradation in FRs and harvesting for fibre	Declining	protected areas	Maintain conservation status of the habitat	Fiber harvesting
	Salicaceae	Casearia	runssoricata	VU B1+2b ver 2.3	VU B2ab(ii,iii,iv,v)	Kibale National Park, Bwindi Impenetrable National Park, Kasyoha Kitomi Forest Reserve, Kalinzu Forest Reserve, Jubiya Forest Reserve, Mpanga Forest Reserve, Sango Bay Forests, Ssesse Islands	About 50%	Tropical High Forest	Risk from effects of logging	Declining	Protected in Kibale and Bwindi National Parks, rest of FRs where it occurs poorly protected	Strengthen conservation measures	Clearance of most of the area of Sango Bay and Ssesse Island Forests and habitat degradation through most of the rest, other than Bwindi and Kibale. Rare occurrence of this tree
	Malvaceae	Cola	congolana	VU B1+2c Ver 2.3	VU B1+2ab(i,iv,v)	Bwamba Valley (historical record for Semuliki National Park), Maramagambo Forest Reserve	100%	Mid altitude	potential risk from climate change, and	very few individuals sighted	Protected areas	survey distribution	restricted distribution

Proposed National Redlist for Uganda: Evaluated Plant Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
									habitat degradation				
	Malvaceae	Hibiscus	greenwayi	VU B2ab(iii) Ver 3.1	CR/RE	Mabira Forest Reserve (woodland)	0-5%	Wooded grassland	Habitat degradation and agricultural expansion	Possibly extinct	Protected in FRs	strengthen forest protection and conduct more surveys	Last and only collection in 1918, habitat conversion to settlements and agriculture. Needs clarification on taxonomy as this name is unresolved (theplantlist.org)
	Melastomataceae	Lijndenia	bequaertii	VU B1+2c Ver 2.3	VU A1c;	Ishasha gorge (Bwindi Impenetrable National Park)	30%	rainforest		Presumed Stable	Protected area	Maintain conservation status of the habitat. Urgently need to survey to identify exact AOO and index of abundance and current status	The previous AOO of this species in Uganda is believed to be much greater and what we have remaining in Ishasha Gorge is a remnant population. However, there is no evidence of continuing decline without further studies. Given that this is a single restricted site, it is likely that this should be CR with enough evidence to support the category. The global assessment is from MUIENR in 1998.
	Thymelaeaceae	Craterosiphon	scandens		VU B2ab(iii,v)	Budongo Forest Reserve, Maramagambo Forest Reserve	10%	rainforest	bark harvested as fiber	Presume decline	protected area	regulate harvesting	First recorded by Eilu in Lidia (1999). Very small and restricted population
	Nymphaeaceae	Nymphaea	nouchali	NE	CR B1+2ab(iii)	Lake Mutanda and Lake Bunyonyi	Very small	Shallow sheltered water at the edge of lakes	Habitat conversion to agriculture, water draining	Presume decline	Wetlands have an Act to ensure their protection but this is not enforced	Protect wetlands, but specifically protect areas where this species is found to persist.	This variety of N. nouchali is only found in Uganda and is restricted to high altitude wetlands, habitat conversion is rapidly threatening the existence of this plant
	Burmanniaceae	Afrothimia	winkleri	CR B2ab(iii)	EN B2ab(iii)	Budongo Forest Reserve, Bugoma Forest Reserve	50%?	A parasitic plant in lowland evergreen forest below 1150m, hosts unknown	Small population and very rare	Not sure	In FR's so somewhat protected	Urgently survey to determine exact AOO and estimate numbers as likely to be CR	Very rarely seen parasitic plant - only two records in Uganda from Budongo and Bugoma forests on forest floor in compartment N11 - AOO potentially slightly greater than 10km <sup>2</sup> as required for CR so estimated as EN here unless this can be reassessed. Only known from 5 localities in Cameroon and Uganda and less than 16 individuals in total; if correct would be CR D.
	Podocarpaceae	Afrocarpus	gracilior	LC ver 3.1	EN B2ab(iii,v)	Napak Forest Reserve (Karamoja sub-region), Mt Elgon National Park	Small	Montane forest tree above 1800m	Harvested for timber	Declining in Eastern Uganda	Limited protection in Mt Elgon	Control harvesting of species	Tree with restricted range in Eastern Uganda. Harvested for timber and declining. Only known from two sites, Mt Elgon and Napak FR
	Podocarpaceae	Afrocarpus	usambarensis	EN A2cd+4acd; B2ab(ii,iii,iv,v)	CR B1ab(i,ii,iii,iv,v)	Sango Bay Forest Reserve	About 10%?	Lowland lake shore forest - confined to Sango Bay in Uganda	Harvesting for timber throughout forest	Declining drastically - most mature individuals harvested	FR where it occurs should be protected but this is poorly respected by authorities as well as communities	Cease harvesting and forest loss in the Sango Bay Area	This species only occurs in Sango Bay region. Sango Bay is nominally listed as being 151km <sup>2</sup> but a lot of the forest has been totally converted to plantations or cleared for agriculture and has the remainder heavily harvested. Almost all mature individuals have been lost, which will lead to slow recruitment.
	Podocarpaceae	Podocarpus	latifolius	LC ver 3.1	VU A2cd	Rwenzori National Park, Bwindi Impenetrable National Park, Mgahinga National Park, Mt Elgon National Park, Echuya Forest Reserve, Sango Bay Forest Reserve (Namalala), Acholi sub-region (Mt. Lomwaga), Entebbe Botanical garden, Masaka District (Kyebe), Mpororo (Kisoro District), Nakawa (NFA offices), Imatong massif, Nambigirwa Forest Reserve	10%	Upland and lowland forest	Harvested for timber where it occurs	Declining outside Protected areas and from illegal harvesting within PAs	Protected in parks and some forest reserves	control harvesting of species and encourage domesticate	Relatively rare where it occurs in the montane forests in Uganda and Mature individuals rare at each location where observed. Although there are a large number of locations listed, many of these forests are in rapid decline due to degradation and clearance and so a loss of more than 30% is suspected. Species declining from timber harvesting
	Cyperaceae	Carex	runssorensis	VU B2ab(iii) Ver 3.1	VU D2	Rwenzori Mt National Park, Mt Muhabura, & Mt Sabinyo (Mgahinga Gorilla National Park)	At least 50%	sedge of high altitude moorlands in boggy areas	Potential risk from climate change	Presumed stable	Protected in parks		Altitude is above 3500. Small restricted populations and might be threatened by Climate change
	Cyperaceae	Carpha	emini	VU D2 Ver 3.1	VU D2	Mt Rwenzori National Park, Mt Muhabura, & Mt Sabinyo (Mgahinga Gorilla National Park)	At least 50%	Found above 3500 in boggy areas	Potential risk from climate change	Presumed stable	Protected in parks		Classified as Vulnerable because of limited extent in Rwenzoris in Uganda and pockets in boggy areas of this species. Affected by tourist trampling on tussocks leading to declining quality of habitat. Altitude is above 3500 and might also be threatened by Climate change

Proposed National Redlist for Uganda: Evaluated Plant Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
	Juncaceae	Luzula	abyssinica	LC Ver 3.1	VU D2	Rwenzori Mt National Park, Mgahinga Gorilla National Park, Mt. Elgon National Park	10%	upland grassland (damp places) above 2000 m	potential risk to climate change	Not sure	protected area	Maintain conservation status of the habitat	Restricted distribution
	Juncaceae	Luzula	mannii	VU D2 Ver 3.1	VU D2	Mt Elgon National Park	10%	upland grassland above 3000m asl	potential risk to climate change	Not sure	Protected area	Maintain conservation status of the habitat, survey to ensure that there is no threat to its persistence	Restricted distribution, single location
	Poaceae	Deschampsia	angusta	VU D2 Ver 3.1	VU D2	Rwenzori Mt National Park	At least 50%	alpine	potential risk from climate change	Presumed stable	protected areas	Maintain conservation status of the habitat	Restricted distribution, single location
	Typhaceae	Typha	domingensis	LC ver 3.1	LC								
	Menispermaceae	Albertisia	exelliana	NE	EN B2ab(ii,iii,iv)	Kibale National Park, Virunga	25%	rainforest	habitat degradation	Not sure	protected area	Need to establish status	Unclear if Virunga mean bwindi or is a single site species in Kibale only
Iroko or African Teak	Moraceae	Milicia	excelsa	NT ver 2.3	EN A2acd	Widely distributed outside protected areas mainly in central, eastern and northern Uganda, and in the forests of Budongo, Bugoma, Murchison Falls National Park, Semliki National Park, Kasyoha Kitomi, Kagombe, Mabira, Keitechura, Itwara	2%	Tropical forest and woodlands	Harvesting for timber	Declining as preferred timber species and will not persist outside of protected areas	Poorly protected but listed as classified timber species - need permit	Protect in Nature reserves in FRs. Control licences for FRs and private land, and leave seed trees	This species has declined drastically over the past 70 years in Uganda due to intensive timber harvesting.
Red Stinkwood	Rosaceae	Prunus	africana	VU A1cd Ver 2.3	VU A2ad;	Kibale National Park, Bwindi Impenetrable National Park, Rwenzori Mt National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kalinzu Forest Reserve, Kasyoha Kitomi Forest Reserve, Itwara Forest Reserve, Maramagambo Forest Reserve, Mt. Murongole, Sango Bay Forest Reserve, (record in Mutai FR), Mpigi forests, cultivated mainly in western Uganda	30%	Rainforest, riverine and woodland	Bark harvested for medicinal values (e.g. treatment of prostate cancer)	Declining due to debarking for medicinal values	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	intensify domestication - provide seeds for private woodlots and provide more enforcement for protection of wild trees	Inferred decline in species due to killing of trees by harvesting bark for medicinal values
Antrocaryon	Anacardiaceae	Antrocaryon	micraster	VU A1cd Ver. 2.3	CR D	Bwindi Impenetrable National Park, Kasyoha Kitomi Forest Reserve (formerly recorded in Budongo Forest Reserve, Kalinzu Forest Reserve, Maramagambo Forest Reserve)	small	Rainforest tree harvested for timber	Harvested for timber	Declining because of being harvested for timber - only juveniles seen recently in forests	Protected Areas	Stop harvest of species in FRs, enrichment planting	Only two individuals >50 cm, 2 individuals 30 -50 cm, and 2 individuals of 20-30 cm dbh in KK and Bwindi. Presume no longer present in all other former locations
	Meliaceae	Entandrophragma	angolense	VU A1cd Ver. 2.3	EN A2acd	Kibale National Park, Semuliki National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kasyoha Kitomi Forest Reserve, Itwara Forest Reserve, Kalinzu Forest Reserve, Mpanga Forest Reserve, Mabira Forest Reserve	<5%	Rainforest species and at forest edges	Harvested for Timber	Declining drastically throughout Uganda - most mature trees lost and doesn't fruit until 40-50 cm DBH	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Control harvesting of species	Species has declined greatly over past 100 years in Uganda; intense harvesting has led to at least a 50% loss of population in forests in western Uganda in past 80 years, one location, Namanve forest completely converted to settlement
Sapele	Meliaceae	Entandrophragma	cylindricum	VU A1cd Ver 2.3	EN A2acd	Kibale National Park, Semuliki National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kasyoha Kitomi Forest Reserve, Itwara Forest Reserve, Kalinzu Forest Reserve	5%	Rainforest species at forest edges also	Harvested for Timber	Declining drastically throughout Uganda - most Mature trees lost and doesn't fruit until 40-50cm DBH	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Control harvesting of species	Species has declined greatly over past 100 years in Uganda; intense harvesting has led to at least a 50% loss of population in forests in western Uganda in past 80 years.
	Meliaceae	Entandrophragma	utile	VU A1cd	EN A2acd	Kibale National Park, Semuliki National	5%	Rainforest species at	Harvested for	Declining	Some protection	Control harvesting of	Species has declined greatly. Intense harvesting has led to

Proposed National Redlist for Uganda: Evaluated Plant Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
	e	phragma		Ver 2.3		Park, Budongo Forest Reserve, Bugoma Forest Reserve, Maramagambo Forest Reserve, Itwara Forest Reserve, Kasyoha Kitomi Forest Reserve, Zoka Forest Reserve, Mabira Forest Reserve		forest edges also	Timber	drastically throughout Uganda - most Mature trees lost and doesn't fruit until 40-50CM DBH	in parks but in FRs rampant harvesting has led to loss of most mature individuals	species	at least a 50% loss of population in forests in western Uganda in past 80 years
Light Bossé, Scented Guarea	Meliaceae	Guarea	cedrata	VU A1c Ver. 2.3	EN A2acd	Semuliki National Park, Kibale National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Lake.Victoria (Damba Island), Kasyoha Kitomi Forest Reserve, Mengo District, Masaka District]	5%	lowland Rainforest	Harvested for Timber	Declining in forests where harvested for timber	Some protection in Parks and forest reserves	Control harvesting of species	Mature individuals rarely encountered in forests where intense harvesting has led to at least a 50% loss of population in forests in western Uganda in past 80 years
African Mahogany, White Mahogany	Meliaceae	Khaya	anthotheca	VU A1c Ver 2.3	EN A2ad	Murchison Falls National Park (Rabongo), Semuliki National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kalinzu Forest Reserve, Zoka Forest Reserve, Wambabya Forest Reserve	5%	Rainforest and riverine tree species	Harvested for Timber	Declining drastically throughout Uganda - most Mature trees lost and doesn't fruit until 40-50CM DBH	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Ban harvesting of species because it's a reserved species for Uganda	Species has declined greatly over past 100 years in Uganda. Intense harvesting has led to at least a 50% loss of population in forests in western Uganda in past 80 years. South Mengo forests, zoka, Kalinzu, and Wambabya suffered heavy degradation
African Mahogany, Benin Mahogany, Large-leaved Mahogany, Senegal Mahogany	Meliaceae	Khaya	grandifolia	VU A1c Ver 2.3	EN A2ad	Acholi sub-region (Kilak Hills), West Nile sub-region (Mt Otzi), & East Madi Wildlife Reserve (Zoka), Bugoma Forest Reserve, Budongo Forest Reserve, Kalinzu Forest Reserve	20%	Rainforest and riverine tree species	Harvested for Timber, firewood, charcoal	Declining drastically where it occurs, Mature trees lost and doesn't fruit until 40-50CM DBH	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Ban harvesting of species because it's a reserved species for Uganda	Species has declined greatly. Intense harvesting has led to at least a 50% loss of population in forests in western Uganda in past 80 years
African Mahogany, Benin Mahogany, Dry Zone Mahogany, Senegal Mahogany	Meliaceae	Khaya	senegalensis	VU A1c Ver 2.3	EN A2ad; B1ab(iii,iv)	Murchison Falls National Park, Acholi sub-region, East Madi Wildlife Reserve (Zoka) & West Nile sub-region	25%	Savanna woodland and riparian	Harvested for Timber	Declining drastically throughout Uganda - most Mature trees lost and doesn't fruit until 40-50CM DBH	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Ban harvesting of species because it's a reserved species for Uganda	Species has declined greatly over past 100 years in Uganda. Intense harvesting has led to at least a 50% loss of population in forests in West Nile, Acholi, and E. Madi in the past 80 years
	Meliaceae	Lepalea	mayombensis	VU A1c ver 2.3	EN B2ab(ii,iv,v)	Kalinzu Forest Reserve, Kasyoha Kitomi Forest Reserve, Bwindi Impenetrable National Park (Ishasha Gorge)	small	Riverine rainforest	Restricted range in Uganda and rare where it occurs. Harvested for timber and construction of logging decks	Probably declining because of harvesting	Protected in Bwindi	Control harvesting of species, collecting seeds	Only known from riverine forest in KKFR and probably Bwindi NP. Harvested where found so probably declining. Also not expected to persist in Kalinzu. Area is less than 500 km2 AOO as result of riverine distribution. Mature individuals rarely encountered in forests
Brown Mahogany, Kilimanjaro Mahogany	Meliaceae	Lovoa	swynnertonii	NT ver 3.1	EN A2acd	Kibale National Park, Semuliki National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kalinzu Forest Reserve, Kasyoha Kitomi Forest Reserve, Itwara Forest Reserve, Mabira Forest Reserve	20%	Rainforest species	Harvested for Timber and fuelwood	Declining drastically, most and mature trees lost	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Ban harvesting of species because it's a reserved species for Uganda	Species has declined greatly over past 100 years in Uganda due to heavy harvesting for timber, stable population only in Kibale NP. Lwamunda forest is heavily degraded, species on the reserve list of Uganda
African Walnut, Congowoo	Meliaceae	Lovoa	trichiloides	VU A1c Ver 2.3	EN A2ad	Kibale National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kalinzu Forest Reserve, Kasyoha Kitomi Forest	20%	Rainforest and lakeshore forests	Harvested for Timber	Declining drastically and most Mature	Some protection in parks but in FRs rampant	Control harvesting of species	Intense harvesting and land use change has led to drastic decline over past 100 years in Uganda, lakeshore forests converted to other land uses

Proposed National Redlist for Uganda: Evaluated Plant Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% global population in Uganda	Habitat preference	Key threats	Population trend in Uganda	Current conservation measures	Recommended conservation measures	Summary rationale
d, Tigerwood						Reserve, Itwara Forest Reserve, Maramagambo Forest Reserve, Lwamunda Forest Reserve (Mengo), Wabitembe Forest Reserve (Masaka)				trees lost	harvesting has led to loss of most mature individuals		
	Meliaceae	Turraeanthus	africana	VU A1cd Ver 2.3	VU A2cd	Kibale National Park, Bwindi Impenetrable National Park, Semuliki National Park, Queen Elizabeth National Park, Itwara Forest Reserve, Kasyoha Kitomi Forest Reserve, Budongo Forest Reserve, Kalinzu Forest Reserve, Bugoma Forest Reserve, Kagombe Forest Reserve, Mafuga Forest Reserve (Kasese District)	10%	Tropical rainforest	harvested for timber and habitat degradation, mainly the FRs	declining	protected areas	Ensure recovery of population before allowing sustainable harvesting	Highly sought after for timber due to reduction in preferred timber species e.g. mahogany
	Rutaceae	Citropsis	articulata		VU A2cd	Kibale National Park, Semuliki National Park, Bwindi Impenetrable National Park, Mabira Forest Reserve, Budongo Forest Reserve, Bugoma Forest Reserve, Itwara Forest Reserve, Kagombe Forest Reserve, Kasyoha Kitomi Forest Reserve, Kalinzu Forest Reserve	5%	rainforest	root and bark harvesting for medicinal purposes	declining	protected areas	Survey distribution and regeneration	Widespread, but threatened by overharvesting. The root is considered to be an aphrodisiac, and the bark is also used as a traditional medicine.
	Rutaceae	Fagaropsis	angolensis	NE	VU A2acd	Budongo, Bugoma, Itwara, Kibale, Semuliki NP, KKFR, Kalinzu, Rabongo (MFNP), Maramagambo, Rwenzori, Mabira	10%	Rainforest species but rare	Harvesting for timber and poles	Declining in forests where harvested for timber and poles	Some protection in Parks and forest reserves	Control harvesting of species	Mature individuals rarely encountered in forests where harvesting has been allowed
	Sapindaceae	Chytranthus	atroviolaceus		EN B1+2ab(iii,iv,v)	Budongo Forest Reserve	2%	Tropical high forest	Habitat degradation	Declining	Protected area	Maintain conservation status of the habitat	restricted distribution, very rare species, and habitat degradation
	Bignoniaceae	Spathodea	campanulata		LC	UI-4		rainforests and woodland	Bark harvested for medicinal	Stable	Culturally protected	Stop ring debarking	Widely spread and establishes easily
	Oleaceae	Olea	welwitschii	NE	VU A2acd	Kibale National Park, Semuliki National Park, Rwenzori Mt National Park, Mt Elgon National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kalinzu Forest Reserve, Kasyoha Kitomi Forest Reserve, Itwara Forest Reserve, Mabira Forest Reserve, Murongole Forest Reserve, Mengo District, Masaka District, Napak, Mubende District (Lwengeye), Gangu Forest (Gomba), Rwizi Forest (Mbarara), Nakizi Forest (Mukono), Minziro Forest Reserve(Sango Bay)	10%	rainforest tree	Harvested for Timber	Declining drastically	Some protection in parks but in FRs rampant harvesting has led to loss of most mature individuals	Control harvesting of species	Species has declined greatly in Uganda due to heavy harvesting for timber, some locations have been heavily degraded. Intense harvesting has led to at least a 30% loss of population in forests in western Uganda in past 80 years

Note: selected elements of the comprehensive listings available with USAID/Uganda. Assessors: B. Kirunda bkirunda@wcs.org; M. Leal mleal@wcs.org; A.J. Plumptre aplumtre@wcs.org; D. Nkuutu dn\_nkuutu@yahoo.com; C. Kabuye ckabuye@cns.mak.ac.ug; S. Prinsloo wprinsloo@wcs.org



**Table 18: Proposed National Redlist for Uganda: Evaluated Mammal Species**

Proposed National Redlist for Uganda: Evaluated Mammal Species													
COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Impala	BOVID AE	Aepyceros	melampus	LC	EN B2b(i,ii,iii,iv)	Lake Mburo National Park, surrounding rangeland in Nyabushozi and Kazo counties	Small percentage - Eastern and southern Africa	Savanna	Poaching, human pressure on habitat within and outside Protected Area, possible disease currently under study?	Decline, but fluctuating	Majority of population within a Protected Area	Need enhanced range management especially within park.	EOO and AOO only 1 location, Lake Mburo is 370km <sup>2</sup> and area outside in rapid decline and does not exceed 500km <sup>2</sup> total. Decline from 1992 with 18,700 to 1999 with 1500, but recovered somewhat to approximately 3500 in 2006 (aerial survey UWA). Note: Populations translocated from Lake Mburo to Katonga Wildlife Reserve in 2013 have not been included.
Lelwel's Hartebeest, Jackson's Hartebeest	BOVID AE	Alcelaphus	buselaphus	EN	NT	>10% Murchison Falls National Park, Kidepo Valley National Park, Pian Upe Wildlife Reserve	Potentially >10% if Lelwels separate species: CAR, Chad, DRC, Southern Sudan, Ethiopia, Kenya, Tanzania, Uganda	Savanna, woodland and open plains	Poaching, may be sensitive to changes in habitat	Decline but appears to be stabilising	Occurs within Protected Areas	Control snaring (bushmeat hunting) within PA system	Only two known sub-populations, AOO 4880. Number of individuals estimated at 18,000 in 1962, declined to 2749 in 1995 and has since recovered to 8108 individuals. Groves and Grubb suggest Lelwel Hartebeest is a separate species, thus even more globally restricted (Sudan DRC, Ethiopia, Uganda). IUCN state global decline of Lelwel's above 50% over 3 generations, so Uganda populations in recovery phase doing relatively well but numbers/locations too low to be complacent
Harvey's/Red Forest Duiker	BOVID AE	Cephalophus	harveyi	LC	NA	Records for Kibale National Park, and Queen Elizabeth National Park believed to be misidentification of C. weynsi.							Two sub-populations reported but otherwise not known to have ever occurred in Uganda and records from Western Uganda and Imatong taken to be a misidentification of C. weynsi. NB Harveys may more properly be considered a sub-species of Natal's, but still listed separately by IUCN global redlist.
White-bellied Duiker	BOVID AE	Cephalophus	leucogaster	LC	NA	Bwindi Impenetrable National Park, Semliki National Park (presumed presence)							Only two known sub-populations. Kingdon thought it a potential to occur in these two sites but no evidence that it has ever been recorded, so it cannot be assessed.
Black-fronted Duiker	BOVID AE	Cephalophus	nigrifrons	LC	VU B2ab(iii)	Bwindi Impenetrable National Park, Mgahinga National Park, Rwenzori Mt National Park, Kasyoha-Kitomi Forest Reserve	Small percentage: South-eastern Nigeria to the Albertine Rift, and in isolated montane forests in East Africa	Swamp forests and alongside watercourses	Habitat degradation and bushmeat hunting	Inferred decline due to rapid habitat loss over parts of range	Part of range protected within National Parks and Forest Reserves, little control of hunting or forest degradation	Address protection of habitat in forest reserves and control bushmeat hunting	Recent camera trapping data shows in all sites named. (Virunga volcanoes 1991 density of 14-20 per km <sup>2</sup> ). AOO is combined area of 4 sites (not all of Rwenzori is suitable forest habitat)
Rwenzori Duiker	BOVID AE	Cephalophus	rubidus	EN B1ab(iii); C2a(ii)	EN B1ab(iii); C2a(ii)	Rwenzori Mt National Park	>50%: Uganda, DRC	Upper montane habitats	Habitat degradation and bushmeat hunting	Presume decline due to lack of sightings	Within a protected area	Establish population size	Only found in 1 location. Presumed presence in DRC otherwise may be endemic to Uganda.
Red-flanked Duiker	BOVID AE	Cephalophus	rufilatus	LC	DD	Bugungu Wildlife Reserve, West Nile sub-region	Small percentage: West and Central Africa to Nile Valley	Savanna woodlands	Habitat degradation and bushmeat hunting	Inferred decline	Only a small part of range in PA	Confirm location in Bugungu and whether persisting in West Nile	No recent occurrence data to allow better classification. Bugungu record from 1990's (Frontier)
Yellow-backed Duiker	BOVID AE	Cephalophus	silvicultor	LC	LC	Bwindi Impenetrable National Park, Rwenzori Mt National Park, Mt Elgon National Park, Maramagambo Forest Reserve, Kasyoha-Kitomi Forest Reserve	Small percentage: Senegal to south-western Sudan south to Zambia, Angola	Moist lowland to montane forests, forest-savanna mosaics and adapts to secondary forest and bushlands	Habitat degradation loss and bushmeat hunting	Inferred decline	Part of range protected within National Parks and Forest Reserves, little control of hunting or forest degradation		Montane forest species sighted relatively frequently in Bwindi
Weyns' Duiker	BOVID AE	Cephalophus	weynsi	LC	LC	Kibale National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Western forests, Mt Elgon	Possible 10%: Burundi, DRC, Kenya, Rwanda, South Sudan, Tanzania, Uganda	Medium-altitude forest	Habitat degradation and bushmeat hunting	Inferred decline as many of forests increasingly degraded	Part of range protected within National Parks and Forest Reserves, little control of hunting or forest degradation	Control snaring (bushmeat hunting) within PA system	Weyns can be considered sub-species of Peters, but here taken as distinct (Grubb and Groves, 2001) . Sighted commonly enough to still be considered LC despite threats in Kibale and Queen Elizabeth (D.R. Mills 2014), although noted to be remarkably rare in some areas e.g. Bwindi (B. Mugerwa)
Topi	BOVID	Damalis	lunatus	LC	LC	Lake Mburo National Park,	Widespread	Savanna	Bushmeat hunting,	Believed stable	Occurs within		



**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
	AE	cus				Queen Elizabeth National Park, Kidepo Valley National Park, Pian-Upe Wildlife Reserve	sub-Saharan Africa		competition with cattle	or increasing	Protected Areas		
Roan Antelope	BOVID AE	Hippotragus	equinus	LC	CR C1+2a(ii)	Pian Upe	Small percentage: West, Central, Eastern and Southern Africa	Tropical and sub-tropical savanna and shrublands	Poaching, possibly sensitive to changes in habitat	Decline	only found in 1 WR with poor protection	Sustained conservation programme with possible reintroduction with increased protection measures in place	Previously found in LMNP and KVNP but now extinct from both these parks. At risk of extinction without urgent conservation measures. Pian Upe (EOO + AOO is 2154km <sup>2</sup> ). A severe drought is considered a potential extinction risk throughout its remaining range. Population total estimated at 70 (estimate from Sport Hunting concession 2014), therefore population size (mature individuals) well below this.
Waterbuck	BOVID AE	Kobus	ellipsiprymnus	LC	LC	Queen Elizabeth National Park, Murchison Falls National Park, Lake Mburo National Park, Kidepo Valley National Park, Kabwoya Wildlife Reserve, Katonga Community Conservation Area	Formerly widespread throughout sub-Saharan Africa	Savanna woodland and forest savanna mosaic near permanent water	Hunted for food and sport	Numbers believed stable or increasing			Considered eliminated in parts of former range in Africa
Ugandan Kob	BOVID AE	Kobus	thomasi	NE	LC	Queen Elizabeth National Park, Murchison Falls National Park, Kabwoya Wildlife Reserve, East Madi Wildlife Reserve, Toro-Semliki Wildlife Reserve	+60% Uganda - also DRC, Southern Sudan	Grasslands and floodplains near water	Bushmeat hunting, habitat loss	Numbers declining outside of protected areas, but increasing within	Within Protected areas		Status listed according to C Groves and P Grubb 2011 revision of antelope taxonomy, so K kob does not occur in Uganda. Majority of range occurs in Uganda
Guenther's Dik-dik	BOVID AE	Madoqua	guentheri	LC	LC	Kidepo Valley National Park, and widely occurring in the North Eastern area	North-east Africa	Dry, hot-arid and semi-arid bushlands	May be hunted	No evidence of decline	Range partially within PA		Widely occurring species in the Karamoja sub region.
Pygmy Antelope	BOVID AE	Neotragus	batesi	LC	EN B2ab(iii)	Semliki National Park, Maramagambo Forest Reserve	Small percentage: South Eastern Nigeria to Western Uganda	Moist lowland rainforest preferring dense undergrowth	Bushmeat hunting, specific habitat requirements and low numbers may increase its vulnerability. Habitat degradation in range	Inferred decline from various pressures and lack of sightings	Within Protected Area system, but not well protected	Carry out further study to establish likely status. Control illegal snaring	Reported record for Semliki, Maragambo, Kalinzu and Kibale by Kingdon early 70s (based on hunters reports) and suspected sighting in 90s. 69 Camera trap records from Maramagambo in 2014 (D.R. Mills), none from Kibale, Budongo, KasyohaKitomi, Bwindi, Rwenzori. AOO of Maramagambo (443km <sup>2</sup> ) puts this species as endangered. Likely decline due to snaring and habitat degradation in Maramagambo Forest Reserve which is not as well protected.
Klipspringer	BOVID AE	Oreotragus	oreotragus	LC	VU B2ab(iii)	Lake Mburo National Park, Kidepo Valley National Park, Karamoja Sub-region	Small percentage: East and southern Africa with populations in Nigeria, DRC, CAR	Rocky and mountainous terrain	Bushmeat hunting, competition with cattle	Presume decline due to lack of sightings	Range partially within PA system but likely to be experiencing pressure outside	Study status in Karamoja	Species known from only two localities in the country and no data on numbers is available, particularly in KVNP where it is rarely observed
Oribi	BOVID AE	Ourebia	ourebi	LC	LC	Queen Elizabeth National Park, Murchison Falls National Park, Lake Mburo National Park, Kibale Valley National Park, East Madi Wildlife Reserve, Kabwoya Wildlife Reserve							
Common Warthog	BOVID AE	Phacochoerus	africanus	LC	LC	Widespread							
Blue Duiker	BOVID AE	Philantomba	monticola	LC	LC	Throughout medium-altitude forest of Uganda	Widely distributed in central, eastern and southern Africa	Primary and secondary forest	Resilient - known to withstand habitat degradation and bushmeat hunting	Presumed stable	Part of range protected within National Parks and Forest Reserves, little control of hunting or forest degradation	Address protection of habitat in forest reserves and control bushmeat hunting	Probably most common duiker in Ugandan forests. However all duikers expected to be reducing due to uncontrolled bushmeat hunting, population pressures and reduction in forest cover throughout Uganda.

Proposed National Redlist for Uganda: Evaluated Mammal Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Mountain Reedbuck	BOVID AE	Redunca	fulvorufa	LC	EN C1+2a(i)	Mt Moroto National Park, Karamoja sub-region (Napak, Aleklek)	Currently very small percentage: Patchy, Eastern Cape Province to southern Botswana, East Africa north to Ethiopia, Cameroon	Montane forest	Habitat destruction, bushmeat hunting	Decline	Occurs within Forest Reserves	Need to drastically improve protection in Forest Reserves where it occurs, estimate current AOO and numbers and review sport hunting concession	Sightings in Napak and Aleklek in mid 1990, Napak 2014, Mt Moroto not since 1970s (Kingdon). Ranking as EN based on presumption of mature individuals less than 2500, given the very few sightings of this antelope. Sport hunting concession operating in Eastern Uganda likely to reduce numbers further
Bohor Reedbuck	BOVID AE	Redunca	redunca	LC	EN C1	Queen Elizabeth National Park, Murchison Falls National Park, Kidepo Valley National Park	North of forest zone from West to East Africa	Floodplain and woodland habitats, preference for long grass near permanent water	Habitat destruction, bushmeat hunting, competition and vegetation change may be contributing to decline	Decline	Occurs within PA's, inadequate protection against hunting	Improve enforcement in Protected Areas. Establish status of population in country and ensure active protection measures	Despite literature presuming this species is regionally extinct (IUCN SSC Antelope Specialist group 2008), surveys in 2010 give a total of 9 reedbuck in the Greater Virunga landscape and elsewhere also very low numbers and declining (estimated 400 in KVNP, Karenga (WCS, 2014)
Common Duiker	BOVID AE	Sylvicapra	grimmia	LC	LC	Widespread							
African Buffalo	BOVID AE	Syncerus	caffer	LC	LC	Widespread							Status could be listed different if the C Groves and P Grubb 2011 revision of antelope taxonomy is accepted
Common Eland	BOVID AE	Taurotragus	oryx	LC	EN C2b	Lake Mburo National Park, Kidepo Valley National Park, Pian Upe Wildlife Reserve	<5%: Eastern and parts of southern Africa	Savanna woodlands	Bushmeat hunting, loss of habitat, fire-induced habitat change	Decline	Protected in NPs		Small restricted populations. Some question about actual numbers due to fluctuating counts: LMNP latest population count estimated at 1400 (UWA 2012). Lamprey estimated LMNP 273 (1995), 88 (1996), 285 (1997), 1442 (1998), 199 (1999), 28 (2002), 606 (2006). KVNP estimated at 28, June 2014 (300 in 1967-72). Previously recorded for Katonga and West Madi, and other areas, now not expected to be present.
Greater Kudu	BOVID AE	Tragelaphus	strepsiceros	LC	CR C1+2a(i); D	Kibale Valley National Park, Eastern Karamoja	Very small percentage: Main range eastern and southern Africa, also occurs in DRC	Mixed scrub and woodlands	Bushmeat hunting, loss of habitat, fire-induced habitat change	Decline	Occurs partially in Pas (KVNP)	Establish current population, introduce species specific conservation measures alongside adequate enforcement	Small restricted populations. Possibly extinct in Djibouti, South Sudan and Sudan. Lamprey 2003 lists KVNP population as numbering about 10 individuals. Aerial surveys throughout its range have not recorded this species (1967, 1982, 1998). Likely to be in very small numbers if still present. Listing based on numbers, but Lamprey also estimates AOO which could also be used.
Lesser Kudu	BOVID AE	Tragelaphus	imberbis	NT	CR C1+2a(i); D	Kibale Valley National Park, Eastern Karamoja	Scattered <5%: Arid areas of North Eastern Africa	Thorn bush in semi-arid areas	Bushmeat hunting, loss of habitat, fire-induced habitat change, particularly threatened where migrate or reside out of Pas	Decline	Occurs partially in Pas (KVNP)	Establish current population, introduce species specific conservation measures alongside adequate enforcement	Small restricted populations. Possibly extinct in Djibouti. Lamprey 2003 lists KVNP population as numbering about 10 individuals as per Greater Kudu, although the population in 1995 is estimated at 400. Aerial surveys throughout its range in Uganda have not recorded this species (1967, 1982, 1998). Likely to be in small numbers if still present. Listing based on numbers, but Lamprey also estimates AOO which could also be used.
Bushbuck	BOVID AE	Tragelaphus	scriptus	LC	LC	Widespread							
Sitatunga	BOVID AE	Tragelaphus	spekii	LC	VU B1b(i)c(i)	Widespread		Swamps, wetlands	Wetland degradation and conversion	Decline inferred from rapid loss and degradation of wetland throughout range	Wetlands protected by law; enforcement completely inadequate	enforce wetland protection and commence conservation programme in sites that have potential for stabilising decline	Listing on account of pressures on suitable habitats and hunting outside protected areas. Sitatunga in Ssesse Islands taken as separate species
Ssesse Island Sitatunga	BOVID AE	Tragelaphus	sylvestris	NE	CR B1ab(v)	Ssesse Islands (Nkosi Island only)	100%	Deepwater swampland	Wetland degradation and	Decline inferred from rapid loss	Wetlands protected by law; enforcement	Protected as a Sitatunga Sanctuary but	Skulls from Ssesse (Nkosi Island) markedly different, but other Islands similar to mainland, therefore if accepted this is a single

Proposed National Redlist for Uganda: Evaluated Mammal Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
									conversion, bushmeat hunting	and degradation of wetland throughout range and known hunting	completely inadequate	enforcement poor	restricted site endemic
Rothschild's Giraffe	GIRAFFIDAE	Giraffa	rothschildi	EN	EN B1ac(iv)	Murchison Falls National Park, Kidepo Valley National Park	>80%: Uganda, smaller reintroduced populations Kenya and Southern Sudan considered likely RE	Savanna systems	Disease and poaching, incidental snares	Population increase currently but previous decline	Ugandan population entirely within Pas	Monitor for disease and other risks (likely to be low genetic diversity) and carry out habitat assessment to confirm AOO	Only 1 completely wild population in Uganda (MFNP). Over 2 generations the population of MFNP has fluctuated from an estimated 575 (1970s) to 5 in 1980 and back to 880 (WCS 2014) including juveniles. Previous wild population in KVNP considered unviable as numbers had dropped to 4 animals by 1991 and despite reintroductions the numbers are now still only 20 with little recruitment. Only introduced populations now occur in Kenya: Lake Nakuru (where numbers still declining) and other fenced sites in Kenya. VU listing as AOO (MFNP north of Nile) 1798km <sup>2</sup> but suitable habitat more limited so should be upgraded and in reality
Hippopotamus	HIPPOPOTAMIDAE	Hippopotamus	amphibius	VU	VU B2b(iii)c(iv)	Widespread though only concentrated in Queen Elizabeth National Park and Murchison Falls National Park	Approx 5%: Throughout sub-Saharan Africa, East Africa as stronghold	Lakes and rivers in savanna zone	Bushmeat hunting, habitat loss	Decline	Reasonable protection within PA's		Reduced populations within PAs (Lake Edward 30,000 in 1960's dropped to 5-6000 by 2014) despite recent limited recovery and likely more rapid reductions elsewhere. Based on size of habitat (lakeshore) estimated as less than 2000km <sup>2</sup>
Giant Forest Hog	SUIDAE	Hylochoerus	meinertzhageni	LC	EN B1ab(iii)	Queen Elizabeth National Park, Kibale National Park	2%: West Africa, banks of Congo River, Albertine Rift and montane forest of Kenya and Ethiopia	Variety of forest types	Bushmeat hunting, predation and habitat degradation	unknown	population in Protected area	Refine AOO	Populations known in Queen Elizabeth and Kibale, previously recorded in other Western Forests but no sightings and presume drastic decline. Density was reported as >10 km <sup>2</sup> in 1999 (QENP).
Bushpig	SUIDAE	Potamochoerus	larvatus	LC	LC	Widespread			Bushmeat hunting				
Red river Hog	SUIDAE	Potamochoerus	porcus	LC	DD	Western Uganda							Opinion still divided on the occurrence of this species in Uganda as field observations may only represent dichromatism, however camera trap records of bush pigs that look like P. porcus have been obtained from Kibale (D.R. Mills 2014), therefore listing of DD appropriate until further verification obtained.
Water Chevrotain	TRAGULIDAE	Hyemoschus	aquaticus	LC	DD	Semliki National Park	West and central African species which may extend to Western Uganda	Lowland rainforest and thickets rarely more than 250m from water	Possibly affected by hunting and river seasonality	Decline suspected due to lack of records	Within Protected Area system	need to establish if this species is actually present in Uganda or whether a vagrant	In Uganda has only been reported for Semliki in 1970s (Kingdon). One known area and no recent known record. If present likely to be EN
Side-striped Jackal	CANIDAE	Canis	adustus	LC	NT	Murchison Falls National Park, Queen Elizabeth National Park, Kibale National Park, Kidepo Valley National Park, Lake Mburo National Park, Bwindi Impenetrable National Park, Mgahinga National Park, Kasyoha-Katomi Forest Reserve, Kalinzu Forest Reserve, Echuya Forest Reserve	Small percentage: Sub-Saharan Africa	Wide range of habitats including farmland, peri-urban	Persecuted for perceived rabies transmission and stock-killing	Presumed decline from lack of sightings	Partially within PA system	Requires assessment in core range areas	Few sightings in normal habitat for species (savanna) but does occur occasionally in camera trap photos in forest; e.g. in forest/grassland mosaics in Kibale concurrently with servals and in farmland near Dura swamp area (D.R. Mills), which is probably an adaptation to prey availability. However, everywhere sparse and possibly less than 2000 mature individuals therefore needs further assessment as could be threatened.
Golden Jackal	CANIDAE	Canis	aureus	LC	DD	Kidepo Valley National Park	North, North-east and East Africa					Establish presence, breeding in Uganda	may occur in Uganda but no certain record known to us. May be an occasional vagrant from Kenya/Southern Sudan. Numbers increasing elsewhere
Black-backed	CANIDAE	Canis	mesomelas	LC	DD	Kidepo Valley National Park, Pian	Small	Savanna		Decline	Range partially within	Establish current status	No recent data available to enable certain evaluation

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Jackal	AE		as			Upe Wildlife Reserve, may be more widely occurring in the North Eastern area	percentage: Disjunct populations in Eastern Africa and Southern Africa			suspected due to lack of records	PA system		
Hunting Dog	CANIDAE	Lycaon	pictus	EN	CR D	Pian Upe Wildlife Reserve and possibly Karamoja to Kidepo Valley National Park	Unknown: Formerly widespread throughout sub-Saharan Africa (now mostly southern or eastern Africa)	Short-grass plains, semi-desert and bushy savanna	In decline throughout range from human eradication and disease	Decline inferred due to knowledge of threats and lack of observations	Range partially includes at least 1 PA	Establish range, instigate protection and disease control programme.	May still range into KVNP and through parts of Karamoja, but only recent confirmed sightings in Pian Upe Wildlife Reserve.
Bat-eared Fox	CANIDAE	Otocyon	megalotis	LC	EN C2a(i)	Matheniko Wildlife Reserve, possibly Kidepo Valley National Park	Very small percentage. Semi-arid regions of eastern and southern Africa	Short grass plains with bare ground	Incidental snares, threats of disease including canine distemper and rabies	Presumed decline	Little protection although Matheniko is a WR	Need improved protection from snaring and study to establish populations, AOO	Very sparsely distributed and rarely seen - presume lower density than Senrengeti Mara ecosystem. Only one geographical region of Uganda. Historical records for Pian Upe and KVNP. Presume a decline, due to likelihood of disease and also due to lack of sightings in previous range. Numbers likely to be very small - occur in isolated pairs. Genetic continuity may also be a problem but range unknown. If numbers known may be upgraded
Cheetah	FELIDAE	Acinonyx	jubatus	VU	CR C1+2a(i); D	Kidepo Valley National Park, Pian Upe Wildlife Reserve, Matheniko-Bokora Wildlife Reserve	1%: East and southern Africa, Sahel region, widespread but sparse	Savanna systems	Genetic isolation, very fragmented, habitat disruption. Loss of prey, hunting pressure	decline	Some of population occurs within Protected Areas but not confined	Improve enforcement in Protected Areas.	Very small population in only one park. Sightings in KVNP by Lamprey et al 2002. Further opportunistic sightings recently in Pian Upe and road between Kabwong and Moroto. Based on these observations, population size inferred to be less than 50 total and as scattered would be less than 50 in each sub-population. Individuals may cross-borders to Sudan and Kenya but as these populations are also in decline, this potential is likely to decrease in future.
African Golden Cat	FELIDAE	Caracal	aurata	VU	EN A2b	Bwindi Impenetrable National Park, Kibale National Park, Mgahinga National Park, Kasyoha Kitomi Forest Reserve, Maramagambo Forest Reserve, Echuya Forest Reserve	Possibly 5%: Restricted to Equatorial Africa	Primary moist equatorial forest	Habitat loss, forest degradation and bushmeat hunting (reduces prey available and is bycatch in Uganda confirmed from pictures and skeletons)	Dynamic occupancy modelling shows declines in Bwindi over 5 years (2010-2015), presume similar trend at all sites (possible exception of Kibale)	Populations in Protected areas	Further surveys to establish occurrence and indices of populations (particularly in the small forest reserves and to verify on Elgon)	Only occasional camera trap photos have been recorded for Uganda in a few forest reserves. Data on populations largely lacking, but evidence of decline confirmed in Bwindi (B. Mugerwa, 2015) and few camera trap records noted in Maramagambo (D.R. Mills). Recent taxonomic review has placed in same genus as Caracal. Combined AOO less 1919km, but population estimates suggest upgrading. Population less threatened in Kibale despite snaring, possibly due to absence of leopards (D.R. Mills 2014). A forest/farmland overlap survey showed they do not leave the forest edge, even to travel down swamp/bush valleys. Uganda is probably one of the range states where the population has declined the most due to extensive forest clearing in the past and now largely confined to PA's. ANY change in poaching/logging levels or enforcement (will or capacity) could easily extirpate populations from the small refuges in which they currently persist.
Caracal	FELIDAE	Caracal	caracal	LC	DD	Kidepo Valley National Park	Widely distributed through Africa and Asia	Various - Semi-desert, savanna to woodland but preference for lower rainfall and degree of cover	Persecution, habitat degradation	Presume decline due to lack of sightings			Now considered closely allied with African Golden Cat. Little known about its range and population
African Wild Cat	FELIDAE	Felis	silvestris	LC	DD	Murchison Falls National Park, possibly more widespread	Northern, Eastern and Southern Africa	tolerate wide variety of habitat except closed forest	Hybridisation with domestic cats said to be reason for decline	Presume decline as lack of sightings	Species occurs in Protected area	Review status	Records only for one area in Uganda (MFNP), and no recent records of occurrence are available. None have been recorded in Kibale, surrounding farmland or Maramagambo despite extensive camera trapping (D.R. Mills).
Serval	FELIDAE	Leptailu	serval	LC	NT	Widespread	Small	Well-watered	Wetland habitat	Inferred decline.	Partially within PA	Review status	Regular sightings reported but still very little known of numbers

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
	E	rus					percentage: Sub-Saharan Africa	savanna long-grass and reedbeds or other riparian types, high canopy closed forest, recorded up to alpine moorlands	loss and degradation and burning, both leading to scarcity of prey. (percieved depredation behaviour), bushmeat hunting also reduces prey base	If found to be strongly linked with Papyrus swamp then likely to be more at risk due to rapid conversion	system		and range. Likely to be declining, possibly rapidly. Their populations may be linked to Uganda's extensive papyrus/swamp network and would be affected by clearance as with sitatunga. 20 captures recorded in 3 months along the Dura/Njuguta swamps in Kanyawara community through Kiko tea plantation. There are also quite a few in the grassland/forest mosaic areas of Kibale (D.R. Mills).
Lion	FELIDAE	Panthera	leo	VU	CR C1+2a(i)	Queen Elizabeth National Park, Murchison Falls National Park, Kidepo Valley National Park (very small numbers also in Toro-Semliki WR)	2-3%: East and southern Africa, Sahel region	Savanna systems	Poisoning, snaring driven by increasing population pressure, loss of prey,	declining	Populations mostly resident within Protected Areas	Enforce anti-poaching and park boundary integrity	Small fragmented populations in 4 parks totalling 424 (Carnivore Action Plan 2010-2020) and declining numbers since, estimate of mature individuals based on monitored prides in areas show at least 50% are immature (lgobal population estimate about 20,000).
Leopard	FELIDAE	Panthera	pardus	NT	VU C1+2(i)	WIDE SPREAD throughout Uganda	Unknown: Sub-saharan Africa	Savanna & Forest	Human-wildlife conflict, hunting, habitat loss,	Expected decline	Landscape species not confined to Pas, but reasonably protected within Pas	Improved enforcement in Pas and national study to determine population size	May need careful examination; although widely occurring, numbers and observations are scarce. Increased reports on leopard incidences with local community (inferred due to both increasing population in AOO and decreasing natural habitat and prey species in AOO). Population size in any Park presumed less than 200, occurrence outside PAs presumed to be very rare. Inferred maximum population size less than 10,000, but may be less than 2500, therefore requires study nationally. Have been completely extirpated from Kibale and Bwindi (D.R Mills). Causes unknown and needs urgent assessment as may also have occured elsewhere and would point to very significant persecution.
Marsh Mongoose	HERPOTIDAE	Atilax	paludinosus	LC	LC	Widespread							
Jackson's Mongoose	HERPOTIDAE	Bdeogale	jacksoni	NT	DD	Murchison Falls National Park, Mt Elgon National Park	Kenya, Uganda, Tanzania					Review status and confirm records for MFNP and whether the species is present in Mt Elgon	Kingdon et al 2013 map this species as extending its range into Uganda in The Mt Elgon NP area, and it is known from other East African massifs. Two recent camera trap photos from MFNP are attributed to this species as they look like nothing else among the small sized carnivores and would represent the first known occurrence in Uganda beyond Mt Elgon. Not enough information to evaluate
Alexander's Cusimanse	HERPOTIDAE	Crossarchus	alexandri	LC	VU B2ab(iii)	Mt Elgon National Park, Kibale National Park, Budongo Forest Reserve	DRC and Uganda, possibly CAR	Forest	Habitat loss, forest degradation	Presumed decline	Within Protected Area system, but not well protected especially in Mt Elgon	Review AOO and increase protection for Elgon populations	Combined AOO of 1636km <sup>2</sup> if this species presumed not found elsewhere
Savanna Mongoose	HERPOTIDAE	Dologale	dybowskii	DD	LC	Murchison Falls National Park, Thicketed shores of Lake Albert							Urgently need quantitative analysis as only MFNP numbers increasing and elsewhere lack of success poorly understand.
Dwarf Mongoose	HERPOTIDAE	Helogale	parvula	LC	LC	Lake Mburo National Park, Kidepo Valley National Park							
Egyptian Mongoose	HERPOTIDAE	Herpestes	ichneumon	LC	LC	Widespread							
Slender Mongoose	HERPOTIDAE	Herpestes	sanguineus	LC	LC	Widespread							
White-tailed Mongoose	HERPOTIDAE	Ichneumia	albicauda	LC	LC	Widespread							
Banded Mongoose	HERPOTIDAE	Mungos	mungo	LC	LC	Widespread							
Spotted Hyena	HYAENIDAE	Crocuta	crocuta	LC	CR C1	Queen Elizabeth National Park, Murchison Falls National Park,	<2%: Sub-Saharan Africa	Wide range, savanna,	Deliberate persecution,	Decline though reasons poorly	Within Protected Area system	Need better implementation of	Estimated total populations 324 - 211 QENP, 38 MFNP, 75 KVNP (Large Carnivore Action Plan 2010) with very few elsewhere,



Proposed National Redlist for Uganda: Evaluated Mammal Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
						Lake Mburo National Park, Kidepo Valley National Park		woodland except desert, forest	Poisoning, predator competition, disease	understood		action plan and protection	assume at least 40% juvenile) and numbers known to still be declining
Striped Hyaena	HYAENIDAE	Hyaena	hyaena	NT	CR C2a(i,ii)	Kidepo Valley National Park	3%: Northern and east Africa, Arabian Peninsula, Asia	Savanna systems	Deliberate persecution, Poisoning, predator competition, disease	Decline	Within a protected area	Urgent protection needed.	Likely to be far less than 250 mature individuals as no recent observations known, and no records in carnivore action plan 2010-2020. In decline to point of extinction in other parts of range.
Aardwolf	HYAENIDAE	Proteles	cristatus	LC	DD	Kidepo Valley National Park	Disjunct populations in East, North-eastern and Southern Africa	Open grassy plains - Distribution dependant on Trinervitermes termites their principle food	Possible persecution, habitat quality (especially where termite presence affected)	inferred decline	Within a protected area		Only known from one location in the country, known to be sparsely distributed and uncommon but no estimates of numbers.
African Clawless Otter	MUSTELIDAE	Aonyx	capensis	NT	VU B2ab(iv)	Lake Mburo National Park, Queen Elizabeth National Park	Likely very small: Sub-Saharan Africa except Congo Basin where replaced by Congo Clawless Otter	Marshes, and rivers	Habitat and wetland degradation, water quality, competition for fisheries	Inferred decline	Within Protected Area system	Assess rate of decline and threats, locations to assess possible success fo conservation programmes	Sympatric with Congo Clawless Otter in Uganda. Range limited and AOO within this extremely restricted. No studies available to determine numbers
Congo Clawless Otter	MUSTELIDAE	Aonyx	congica	NT	DD	Lake Mburo National Park, Kibale National Park	Rainforests of Congo Basin from Cameroon to Uganda, Rwanda, Burundi	Rainforests and lowland swamps, forest rivers	Habitat and wetland degradation, water quality, competition for fisheries	Inferred decline	Within Protected Area system	Assess rate of decline and threats, locations to assess possible success fo conservation programmes	Noted as very rare throughout range. 13 independent captures noted mainly along the boundry of Kibale near Rwembata swamp with one along the Dura swamp in farmland (D.R. Mills), but otehrwise status in Uganda unknown.
Striped Polecat/Zorilla	MUSTELIDAE	Ictonyx	striatus	LC	LC	Western Uganda	Sub-Saharan Africa	Wide habitat tolerance but generally absent from forest	Threats unknown	Unknown	Range partially within PA system		Rarely observed but presumed LC
African Spot-necked Otter	MUSTELIDAE	Hydrictis	maculicollis	NT	EN C1	Widespread	Possibly 3-5%: Sub-Saharan Africa	Widespread in aquatic habitats in open clear water	Persecuted as it comes into conflict with fishermen, siltation and pollution affect the species and reduce its food source	Decline	None	Education of fishermen, enforce catchment protection, to improve clarity and quality of water in core habitat	Believed to be less than 2,500 mature individuals although recorded as widespread, but suspected to be reducing in numbers throughout range. Rarely seen and no global estimate
Honey Badger, Rattell	MUSTELIDAE	Mellivora	capensis	LC	NT	Western UGANDA, including Kibale National Park, Murchison Falls National Park, Bwindi Impenetrable National Park	Unknown: Sub-Saharan Africa	Variety of habitats and opportunistic carnivores, scavengers	Directly persecuted and also through indiscriminate poisoning. Potential ocnflict with commercial bee keepers	Decline	Range partially within PA system	Surveys needed to understand population sizes and dynamics	Rare throughout range
East African Striped Weasel	MUSTELIDAE	Poecilogale	albinucha	LC	LC	Lake Mburo National Park, Queen Elizabeth National Park, Murchison Falls National Park							



**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
East African Civet	VIVERRIDAE	Civettictis	civetta	LC	LC	Widespread							
Small-spotted Genet	VIVERRIDAE	Genetta	genetta	LC	LC	Kibale National Park, Murchison Falls National Park, Kidepo Valley National Park							
Servaline Genet	VIVERRIDAE	Genetta	servalina	LC	LC	Widespread but forest dependent		Forest dependent					In Uganda appears to be forest-dependent at least around Kibale, with only 1 capture in farmland (D.R. Mills) so may need to review status as possibly less remaining habitat than presumed.
Rusty Spotted Genet	VIVERRIDAE	Genetta	tigrina	LC	LC	Lake Mburo National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Murchison Falls National Park, Kidepo Valley National Park, Kibale National Park		Savanna bush and grassland, farmland					Not confined to PA's but found in surrounding suitable habitat.
Giant Forest Genet	VIVERRIDAE	Genetta	victoriae	LC	DD	Semliki National Park, Queen Elizabeth National Park	DRC, Uganda	Lowland and medium-altitude forest	Unknown	Unknown	Probably within PA system		Status in Uganda is unclear - species nearly endemic to DRC. More current occurrence data is needed to conclusively assess this species
African Palm Civet	VIVERRIDAE	Nandinia	binotata	LC	LC	Bwindi Impenetrable National Park, Kibale National Park, Queen Elizabeth National Park, Hoima District (Buhuuka)							
Southern Tree Hyrax	PROCAVIIDAE	Dendrohyrax	arboreus	LC	LC	Lake Mburo National Park, Mgahinga National Park, Queen Elizabeth National Park, Mabira Forest Reserve, Budongo Forest Reserve							
Western Tree Hyrax	PROCAVIIDAE	Dendrohyrax	dorsalis	LC	DD	Unknown	West and Central Africa to Northern Uganda	Lowland moist forest to moist savanna, also montane habitats to 3500m					No information available, but literature cites as occurring in Uganda
Yellow-spotted Rock Hyrax	PROCAVIIDAE	Heterohyrax	brucei	LC	LC	Kidepo Valley National Park and Karamoja sub-region							
Common Rock Hyrax	PROCAVIIDAE	Procavia	capensis	LC	LC	Kidepo Valley National Park and Karamoja sub-region	Africa, Arabian Peninsula	drier, rocky areas					No information
East African Rock Hyrax	PROCAVIIDAE	Procavia	johnstoni	LC	NA	Kidepo Valley National Park and Karamoja sub-region							Considered by IUCN as sub-species of P. capensis
Stuhlmann's Golden Mole	CHRYSOCHLORIDAE	Chrysochloris	stuhlmanni	LC	LC	Rwenzori Mt National Park, Kibale National Park, Bwindi Impenetrable National Park, (inc. Kayonza), Mgahinga National Park, Kigezi Highlands							
Four-toed Hedgehog	ERINACEIDAE	Atelerix	albiventris	LC	LC	Widespread							
Long-tailed Musk Shrew	SORICIDAE	Crocidera	dolichura	LC	LC	Bwindi Impenetrable National Park, Rwenzori Mt National Park, Zika Forest Reserve (Entebbe), River Mayanja (Wakiso District), Butiaba (Lake Albert)							
Mount Elgon Musk Shrew	SORICIDAE	Crocidera	elgonius	LC	LC	Rwenzori Mt National Park, Butiaba (Lake Albert), Bukakata (Masaka District), Kitgum, Buusu (Wakiso District)							Presume also Mt Elgon?

Proposed National Redlist for Uganda: Evaluated Mammal Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Tiny Musk Shrew	SORICIDAE	Crocidera	fuscumirina	LC	LC	Rwenzori Mt National Park, Semliki National Park (Ntandi), Hoima District, Tooro (Kabarole District), Kampala, Nabumali (Mbale District)							
Hildegard's Musk Shrew	SORICIDAE	Crocidera	hildegardae	LC	LC	Rwenzori National Park, Kibale National Park, Kalinzu Forest Reserve, Malabigambo Forest Reserve, Kigezi District, Kabanyolo and Katalemwa in Wakiso District							
Jackson's Musk Shrew	SORICIDAE	Crocidera	jacksoni	LC	LC	Butiaba, Murchison Falls National Park, Mt Moroto National Park, Amdat (Nakupiripirit District)							
Butiaba Musk Shrew, Butiaba Naked-tailed Shrew	SORICIDAE	Crocidera	littoralis	LC	NT	Bugungu Wildlife Reserve, Butiaba (Masindi District)	Unknown: Cameroon, CAR, Republic of Congo, DRC, Uganda, Kenya	Sub-tropical or tropical moist lowland forest	Habitat degradation, burning	Unknown	None, Bugungu WR poorly protected	Survey to determine status and EOO	Could be restricted range in Uganda as only known from the North-western shores of Lake Albert between Butiaba and the Victoria Nile (mainly Bugungu WR). Appears fairly common in this location but EOO and abundance/status uncertain
Dramatic Shrew, Ludia's Shrew	SORICIDAE	Crocidera	ludia	LC	DD	Bundibugyo District	DRC, CAR	Restricted to lowland rainforests. It inhabits isolated gallery forest patches in savanna.	Habitat degradation, scarcity of habitat	Unknown	Unknown	Survey to determine status and EOO	IUCN does not list for Uganda and only 2 known Ugandan specimens from 'Bundibugyo' at the Field Museum of Natural History Chicago, so current status in Uganda is unclear.
Greater Grey-brown Musk Shrew	SORICIDAE	Crocidera	luna	LC	LC	Kibale National Park, Rwenzori mt National Park, Kabanyolo (Wakiso District), Entebbe							
Tana River Musk Shrew	SORICIDAE	Crocidera	macarthuri	LC	DD	Mt Moroto National Park	Kenya, Somalia	Dry Acacia savanna	Habitat loss, burning	Unknown	Unknown	Survey to determine status and EOO	First known Ugandan record reported in Thorn & Kerbis 2009 Small mammals of Uganda
Northern Swamp Musk Shrew, Gracile Naked-tailed Shrew, Dark Shrew	SORICIDAE	Crocidera	maurisca	LC	VU D2	Bwindi Impenetrable National Park (Mubwindi and Ngoto Swamps), Echuya Forest Reserve, Entebbe Municipality	Possibly 80%: DRC, Burundi, Uganda.	Montane sedge swamps of Albertine Rift	Unknown	Presumed stable	Swamps reasonably protected in PA system	Determine abundance and status/potential threats	Only recorded with certainty in 6 locations, 1 in Burundi, 1 in DRC, rest in Uganda. Type locality Entebbe but not recorded since and possibly not collected there (Kingdon et al 2013), Exceedingly rare but potentially common in restricted favoured habitat.
Eastern Montane Musk Shrew	SORICIDAE	Crocidera	montis	LC	LC	Rwenzori National Park, Mt Elgon National Park (in Kapchorwa District)							
Kampala Musk Shrew, Uganda Large-toothed Shrew	SORICIDAE	Crocidera	mutesae	DD	DD	Kampala	CAR, DRC, Uganda	Unknown	Unknown			Survey to determine status and habitat requirements	Mophotype described from Kampala (Kingdon et al 2013). Kampala is the type locality but no recent surveys conducted in the Kampala area to assess whether species is still present and in what numbers
Dwarf Musk Shrew	SORICIDAE	Crocidera	nanilla	LC	LC	Rwenzori National Park, Southern Shore of Lake Edward							
Matschie's Musk Shrew	SORICIDAE	Crocidera	nigrofusca	LC	LC	Rwenzori National Park, Kibale National Park (Mpanga River), Mabira Forest Reserve, Malabigambo Forest Reserve, Bundibugyo District, Butiaba (Masindi District)							

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Ruwenzori Musk Shrew, Niobe's Shrew	SORICIDAE	Crocidura	niobe	NT	VU D2	Rwenzori National Park, Mgahinga National Park (Mhavura Peak), Bwindi Impenetrable National Park (Itama River)	Unknown: DRC, Uganda, Burundi, potentially Rwanda	Montane Tropical Moist Forest 2000-3000m	Habitat integrity	Unknown	Within Protected areas	Survey to determine status and habitat requirements	This species has a very restricted range in the few locations where it is known to occur, however the Montane forest areas of the areas where it is found are not very much affected by human activities. More information is needed on potential threats and habitat requirements.
Northern Giant Musk Shrew, Olivier's Shrew	SORICIDAE	Crocidura	olivieri	LC	LC	Widespread	Widespread African species						
Small-footed Musk Shrew	SORICIDAE	Crocidura	parvipes	LC	LC	Murchison Falls National Park, Rwenzori Mt National Park, Kidepo Valley National Park, Budongo Forest Reserve, Masindi District							
Roosevelt's Musk Shrew	SORICIDAE	Crocidura	roosevelti	LC	LC	Rwenzori Mt National Park, Queen Elizabeth National Park, West Nile Sub-region (Rhino Camp)							
Ugandan Forest Musk Shrew, Ugandan Lowland Shrew	SORICIDAE	Crocidura	selina	DD	EN B2ab(iii)	Mabira Forest Reserve (type locality), Zika Forest Reserve, Mpigi Forest (including Mpanga)	Possible 100% Uganda	Tropical moist forests and swamps	Forest loss and fragmentation	Inferred decline	All these forests are subject to serious degradation	Survey to establish AOO in Uganda. Enquire as to status of Kyulu record.	Recheck this species. IUCN lists as present in only 3 forests in Uganda (does Robert have more records?) and that the records from Kyulu Hills in Kenya are possibly not this species and therefore is endemic and likely to be VU globally. AOO from 3 forests nominally 597km <sup>2</sup> but in fact much less due to degradation and continuing decline expected due to habitat loss in most of remaining forest areas
Southern Woodland Musk Shrew, Tumultuous Shrew	SORICIDAE	Crocidura	turba	LC	LC	Presumed widespread	Widespread Central, East and parts of Southern Africa	low-mid elevation tropical moist forest					
Ruwenzori Mouse-shrew, Montane Mouse-shrew	SORICIDAE	Myosorex	blarina	EN	EN B1ab(v)	Rwenzori Mt. National Park	%0%: DRC, Uganda	Montane forest 1800-4000m <sup>2</sup>	Forest degradation at lower altitudes	Decline	Within a reasonably protected area	Investigate status and causes of decline	Known from only one Protected area. Uncommon and appears to be in decline though reasons not understood as forest relatively well-protected. EOO in Uganda 996km <sup>2</sup>
East African Montane Shrew, Greater Large-headed Shrew	SORICIDAE	Paracrocidura	maxima	NT	VU B2ab(i,ii)	Bwindi Impenetrable National Park, Rwenzori Mt National Park	30%: Albertine Rift - DRC, Uganda, Rwanda, Burundi.	Montane tropical moist forest	Believed to be declining due to habitat degradation	Presumed decline	Within Protected Area system	Establish status in Uganda	AOO 1317km <sup>2</sup> . Rare throughout range and declining due to habitat loss. Uganda forests likely to be best protected of range.
Osgood's Montane Shrew, Rwenzori Shrew	SORICIDAE	Ruwenzorisorex	suncoideus	VU	VU D2	Rwenzori Mt National Park, possibly Bwindi Impenetrable National Park	30%: Albertine Rift - DRC, Uganda, Rwanda, Burundi.	Damp and dense mossy vegetation in montane primary tropical moist forest. It appear to be a specialised semi-aquatic species that has been captured from shallow streams.		Unknown	Within a protected area		Known only from one protected area in Uganda. Uganda likely to be best-protected part of range, but degradation still has occurred. Extremely rare throughout range

Proposed National Redlist for Uganda: Evaluated Mammal Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Hero Shrew	SORICIDAE	Scutisorix	somereni	LC	LC	Bwindi Impenetrable National Park, Mabira Forest Reserve, Mpigi Forest Reserve (including Mpanga), Budongo Forest Reserve, Kalinzu Forest Reserve, Kyetume (Mukono District)		800-2350m					
Least Long-tailed Forest Shrew	SORICIDAE	Sylvisorex	granti	LC	LC	Rwenzori Mt National Park, Bwindi Impenetrable National Park, Mt Elgon National Park (Kapchorwa)							
Pygmy Forest Shrew, Johnston's Forest Shrew	SORICIDAE	Sylvisorex	johnstoni	LC	LC	Budongo Forest Reserve, Kigezi Forest Reserve, Malabigambo Forest Reserve, Mabira Forest Reserve					Budongo only relatively well-protected forest in range		
Long-tailed Forest Shrew, Moon Forest Shrew	SORICIDAE	Sylvisorex	lunaris	VU	VU B2ab(iii); D2	Rwenzori Mt National Park, Bwindi Impenetrable National Park, Mgahinga National Park	20%: Albertine Rift Mountains - DRC, Uganda, Rwanda, Burundi	Primary montane tropical moist forest 1785-4500m	Forest loss and degradation	Species said to be common but declining	Range within reasonably protected National Parks	Survey to determine status and protect habitat	Only three known locations in Uganda. Combined AOO is 1020km <sup>2</sup> .
Climbing Forest Shrew	SORICIDAE	Sylvisorex	megalura	LC	LC	Mgahinga National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Lake Nabugabo, Mbale District, West Nile Sub-region							
Dwarf Forest Shrew, Vulcano Shrew	SORICIDAE	Sylvisorex	vulcanorum	NT	VU D2	Rwenzori National Park, Mgahinga National Park	Albertine Rift - DRC, Uganda, Rwanda, Burundi. ~30% Uganda	variety of montane habitats including tropical moist forest, swamps and areas dominated by bamboo vegetation 1780-3000m	Forest loss and degradation on lower slopes	Species presumed declining	Range within reasonably protected National Parks	Survey to determine status and protect habitat	Only two documented locations in Uganda, combined AOO under 1000km <sup>2</sup>
Ruwenzori Otter Shrew	TENRECIDAE	Micropotamogale	ruwenzori	NT	VU D2	Rwenzori Mt National Park	50%: Uganda, DRC.	Streams in rainforest zone 800-900 m, montane forest up to 2,200 m or gallery forest surrounded by secondary savanna (elephant grass) 1,000-1,200 m. Digs tunnels and constructs hay or grass sleeping chambers within them.	Susceptible fish traps, loss of habitat - tends to disappear with human presence	Unknown	Range within reasonably protected National Park	Survey to determine presence/status	Only found Lake Kivu, Rwenzori Mt and west of Lake Edward (DRC). No certain record, directed research needed to confirm occurrence
Giant Otter Shrew	TENRECIDAE	Potamogale	velox	LC	LC	Semuliki National Park, Rwenzori Mt National Park, Bwindi Impenetrable National Park							

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
						('Kayonza'), Kibale National Park (Dura River), Kalinzu Forest Reserve							
Cape Hare	LEPORIDAE	Lepus	capensis	LC	LC	Widespread							Taxonomy needs sorting out - likely <i>L. capensis</i> only South Africa and East Africa could have distinct species.
Savanna Hare, African Savanna Hare	LEPORIDAE	Lepus	microtis	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Mt Elgon National Park, Karamoja subregion, Nakasongola District							
Central African Grass Rabbit, Bunyoro Rabbit	LEPORIDAE	Poelagus	marjorita	LC	VU B1 ab(i,ii)	Western Region (Bunyoro= Buliisa, Hoima, Kibaale, Masindi, Kiryandongo Districts)	<20%: Uganda, Sudan, CAR, DRC,	Moist savanna grassland, woodlands with rocky outcrops, and less prominently in forested areas	Uncertain - possibly burning, hunting, otherwise rapid habitat conversion (agriculture) outside of PA's	Inferred decline	Partially within PA system	Define AOO and current status	Whole country population restricted in Bunyoro areas in and out of PA's. EOO 18,578km <sup>2</sup>
African Long-tongued Fruit Bat	MACROGLOSSINAE	Megalopsis	woermanni	LC	LC	Bwindi Impenetrable National Park (Buhoma), Mabira Forest Reserve, Mpanga Forest Reserve, Budongo Forest Reserve, Entebbe (likely historical record), Maramagambo Forest Reserve, Hoima District (Mabaale)							
Short-palated Fruit Bat	PTEROPODIDAE	Casinycteris	argynnis	LC	EN B1 +2ab(iii,iv)	Mabira Forest Reserve	Presume 10%: Cameroon, CAR, DRC, Uganda	Lowland tropical moist forest and swamp forest	Deforestation or habitat degradation and persecution	Inferred decline	Within a protected area	Establish rate of decline and causes	Only one known population
Straw-coloured Fruit Bat	PTEROPODINAE	Eidolon	helvum	NT	NT	Widespread	Small: Wideranging Africa and Arabian peninsula	Wide range of habitats	Roosting habits put them in line for wide scale persecution and extermination and some hunting for bush meat.	Decline	None	Establish protected roosts	Global estimate of nearly 30% decline due to hunting/persecution. A well-known colony in Kampala (Uganda) declined in numbers over a forty-year period from ca. 250,000 animals to 40,000 in 2007 (Monadjem et al. 2007). Show extreme roost fidelity and roost in colonies of up to millions of individuals.
Little Epauletted Fruit Bat	PTEROPODINAE	Epomoporus	labiatus	LC	LC	Widespread							
Pygmy Epauletted Fruit Bat	PTEROPODINAE	Epomoporus	minimus	LC	LC	Karamoja Resion (Amdat)							Maybe more wide spread. Need to confirm that individuals have not been wrongly idnetified as <i>E. labiatus</i>
Wahlberg's Epauletted Fruit Bat	PTEROPODINAE	Epomoporus	wahlbergi	LC	LC	Mt Elgon National Park, Kyambura Wildlife Reserve, Sironko District (Buluganya)							
Franquet's Fruit Bat	PTEROPODINAE	Epomops	franqueti	LC	LC	Widespread							
Hammer-headed Fruit Bat	PTEROPODINAE	Hypsignathus	monstrousus	LC	LC	Widespread							
Dwarf Epauletted Fruit Bat	PTEROPODINAE	Micropteropterus	pusillus	LC	LC	Widespread							
Little	PTEROPODINAE	Myonycteris	torquata	LC	LC	Semuliki National Park, Budongo							

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Collared Fruit Bat	PODINAE	eris				Forest Reserve, Kalinzu Forest Reserve, Semliki Wildlife Reserve							
Egyptian Fruit Bat	PTEROPODINAE	Rousettus	aegyptiacus	LC	LC	Widespread							
Bocage's Fruit Bat	PTEROPODINAE	Rousettus	angolensis	LC	LC	Widespread							
African Long-haired Fruit Bat	PTEROPODINAE	Rousettus	lanosus	LC	LC	Rwenzori National Park, Bwindi Imepenetrable National Park (Kayonza), Mt Elgon National Park, Echuya Forest Reserve, Kabarole District (Fort Portal)							The Mt. Elgon individuals have recently through Molecular biology techniques shown not to be R lanosus but R aegyptiacus
Short-snouted Elephant Shrew, Short-snouted Sengi	MACROSCELIDIDAE	Elephantulus	brachyrhynchus	LC	DD	South Western Uganda, Murchison Falls National Park	Central, East to Southern Africa						No sufficient recent data to enable satisfactory assessment
Dusky-footed Elephant Shrew, Dusky-footed Sengi	MACROSCELIDIDAE	Elephantulus	fuscipes	DD	DD	Murchison Falls National Park, Luwero District, Nakasongola District	South Sudan, DRC, Uganda	Savanna or woodland					No sufficient recent data to enable satisfactory assessment. Nine locations only throughout African range
Rufous Elephant Shrew, Rufous Sengi	MACROSCELIDIDAE	Elephantulus	rufescens	LC	DD	Kidepo Valley National Park, Karamoja sub-region	Eastern Africa	Dry woodlands and grassland					No sufficient recent data to enable satisfactory assessment
Chequered Elephant Shrew	MACROSCELIDIDAE	Rhynchocyon	cirnei	NT	DD	Mabira Forest Reserve, Budongo Forest Reserve	DRC, Malawi, Mozambique, Zambia, Tanzania, Uganda	montane and lowland forests, closed-canopy woodlands, and riparian thickets where the substrate is usually covered with dense leaf litter.					No sufficient recent data to enable satisfactory assessment
African Sheath-tailed Bat	EMBALONURIDAE	Coleura	afra	LC	LC	Tororo District (Sukulu Hills), Teso Sub-region, Karamoja Sub-region							Fertiliser plants in Sukulu Hills likely to threaten habitat
Pel's Pouched Bat	EMBALONURIDAE	Saccolaimus	pelei	LC	DD	Semuliki National Park, Rwenzori Mt National Park, Budongo Forest Reserve, Kampala Municipality	Equatorial forest of West and Central Africa						Reported in Thorn and Kerbis (2009) citing Kingdon 1974
Mauritian Tomb Bat	EMBALONURIDAE	Taphozous	mauritanus	LC	LC	Scattered across Uganda - Murchison Falls National Park, Queen Elizabeth National Park, Tororo District, Kampala Municipality	Subsaharan Africa and neighboring Islands	Caves and cavities in open country, or even roof spaces - adaptable	Roost disruption and disturbance	Presumed stable	Partial as present in PAs	Surveys needed to understand population sizes and dynamics	Cave and cavity roosting bats, large numbers observed in QENP (around 30 in single roost), lower numbers observed elsewhere. Established presence and recent sightings although still susceptible to roost site destruction or alteration
Naked-rumped	EMBALONURIDAE	Taphozous	nudiventris	LC	DD	Locations unknown	North Africa south to	Arid and semi-arid zones					Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements



**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Tomb Bat	IDAE						Tanzania and west to Turkey, India						could see large population destroyed by roost site destruction or alteration. No recent records for occurrence of the species to permit accurate assessment
Egyptian Tomb Bat	EMBALONURIDAE	Taphozous	perforatus	LC	VU D2	Tororo District, Moroto District (Aleklek)	Small: North to Eastern Africa	Caves in savanna systems (open woodland) avoiding forests	Roost disruption and disturbance	Presumed decline	None	Monitoring to identify location and protection of roosting sites	New sightings for Uganda 1990s in caves in Tororo. More recent sighting in Aleklek (2006). No other records for Uganda. Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration. Lime quarrying and considerable other mining activities in Tororo likely to affect habitat.
Aba Leaf-nosed Bat, Aba Roundleaf Bat	HIPPOSIDERIDAE	Hipposideros	abae	LC	VU D2	Semuliki National Park, Kalinzu Forest Reserve	Possibly 5%: Guinea savanna zone from Guinea-Bissau to Uganda	Savanna, destroyed rainforest (not closed canopy). Roosts in caves	Roost disruption and disturbance	Presumed decline	Range partially within PA system	Establish protected roosts	Cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration. No recent records for occurrence of the species. Sparse distribution throughout range
Sundevall's Leaf-nosed Bat	HIPPOSIDERIDAE	Hipposideros	caffer	LC	NT	Semuliki National Park, Kibale National Park, Mabira Forest Reserve, Kalinzu Forest Reserve, Budongo Forest Reserve	Small: Wide ranging species from south west arabian peninsula including Yemen across most of subsaharan Africa.	Caves and cavities within forest habitat	Affected by forest loss, but roosts within dry wood preferentially selected as fuel source	Decline	Range within PA system	Control of fuelwood extraction.	IUCN notes that this species is absent from central forested regions of Africa, however there is a confusion with H. ruber and likely to be present throughout. Cave and cavity roosting bats, occurring in smaller colonies, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
Greater Cyclops Leaf-nosed Bat, Greater Roundleaf Bat	HIPPOSIDERIDAE	Hipposideros	camerunensis	DD	DD	Semuliki National Park, Budongo Forest Reserve	Cameroon, DRC, Kenya	Presumed forest	Unknown	Unknown	Locations listed are within PA's	Establish veracity of record	IUCN global listing does not cite presence in Uganda, but states that there could be 3 different species. No recent data available to allow assessment
Cyclops Leaf-nosed Bat, Cyclops Round-leaf Bat	HIPPOSIDERIDAE	Hipposideros	cyclops	LC	VU C1	Kibale National Park, Semuliki National Park, Mabira Forest Reserve, Kalinzu-Maramagambo Forest Reserve, Budongo Forest Reserve	West to Eastern Africa	Forest, forest-savanna mosaic. Cavities within forest habitat (preference of hollow tree trunks in dense forest)	Affected by forest loss, but roosts within dry wood preferentially selected as fuel source	Decline	Range within PA system	Control of fuelwood extraction	Only known from Semliki until early 1990s. Only observed roosting in tree cavities in small colonies, which are more susceptible to extraction or natural loss. Inferring low population size from scarcity of roost site within AOO, at less than 10,000.
Sooty roundleaf Bat	HIPPOSIDERIDAE	Hipposideros	fuliginosus	LC	EN B1+2ab(iii)	Kalinzu Forest Reserve	5%: West to central Africa - Uganda as Eastern limit	Associated with primary tropical lowland moist Forest - roosts in cavities	Affected by forest loss, but roosts within dry wood preferentially selected as fuel source and affected by burning in mosaic habitats	Decline	Range within PA system	Need to establish EOO and AOO. Focus protection including control of fuelwood extraction in these areas.	Roosts not observed in Uganda, likely to be in small colonies, susceptible to extraction or natural loss of preferred roosts presumed to be hollow trees. Kalinzu may have the only viable population of this species based on capture results in the Mid-1990s.
Noack's Leaf-nosed Bat	HIPPOSIDERIDAE	Hipposideros	ruber	LC	LC	Widespread	West to Eastern Africa and parts of southern Africa	Non-specific, roosts in caves, cavities and roof spaces	Disturbance of roosts, fumigation	Stable	Range within PA system		Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
Persian Trident Bat	HIPPOSIDERIDAE	Trienops	persicus	LC	CR B2ab(ii,iii,iv)	Moyo District	Very small: Africa, Arabian Peninsula, South Asia	Riparian habitats in low-lying woodland and savanna. Prefers	Roost site destruction, fire management	Presumed decline from lack of sightings and likelihood of	None	Surveys to map occurrence and establish if the historical roost is still	Only a single known roost first reported by Hayman and Hill (1971) referred to in Thorn and Kerbis (2009). Roost not visited in more recent years to confirm continued existence.

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
								roosts in small trees and shrubs (or caves)		threats eradicating roosts		in place	
Heart-nosed Bat	MEGADERMATIDAE	Cardioderma	cor	LC	DD	Karamoja Sub-region	East African species from Sudan, Eritrea to Tanzania						Thorn & Kerbis 2009) mention it for MFNP but no recent records known
Yellow-winged Bat	MEGADERMATIDAE	Lavia	frons	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, Bugungu Wildlife Reserve, Karuma Wildlife Reserve, Buliisa District (Buhuuka)							
Duke of Abruzzi's Free-tailed Bat	MOLOSSIDAE	Chaerophon	aloyisiabaudiae	LC	VU D2	Rwenzori Mt National Park, Budongo Forest Reserve, Kabarole District (Toro)	5%: Patchy distribution in West and Central Africa	Lowland tropical moist and dry forest, dry savanna and more marginally from moist savanna. Suspected to roosts in hollow trees.	Roost site destruction, fire management	Presumed decline from lack of sightings	Range within PA system	Confirm current AOO and status	May occur in other places in Uganda, but so far only known from a few locations in Uganda and no recent observations have been recorded.
Ansorge's Free-tailed Bat, Ansorge's Wrinkle-lipped Bat	MOLOSSIDAE	Chaerophon	ansorgei	LC	DD	Budongo Forest Reserve, Masindi District	Widespread sub-Saharan Africa	Associated with dry woodland savanna. Roost sites include rock crevices, caves and abandoned mines.	Roost site destruction, fire management	Presumed decline from lack of sightings	Range partially within PA	Confirm presence	No Known recent records for this species, likely occurs in only part of Budongo and potentially Bugungu Wildlife Reserve given habitat preference. i
Gland-tailed Free-tailed Bat, Gland-tailed Wrinkle-lipped Bat	MOLOSSIDAE	Chaerophon	bemmeleni	LC	DD	Budongo Forest Reserve, Kampala Municipality	Patchy distribution in West, Central to East Africa						No Known recent records for this species
Spotted Free-tailed Bat	MOLOSSIDAE	Chaerophon	bivittata	LC	LC	Mt Elgon National Park, Moroto District, Busia District							
Chapin's Free-tailed Bat, Long-crested Free-tailed Bat	MOLOSSIDAE	Chaerophon	chapini	LC	DD	Budongo Forest Reserve	Widely distributed through sub-Saharan Africa	Savanna habitats and river valleys. It appears to be associated with intact woodland that is occasionally disturbed (e.g. Mopane damaged by elephants).	Roost site destruction, fire management	Unknown	Range appears to be within PA	Confirm presence	There is only a single known specimen in the collection of the Royal Ontario Museum Toronto taken from Budongo (first reported Hayman & Hill 1971). May be RE or CR
Lappet-eared Free-tailed Bat	MOLOSSIDAE	Chaerophon	major	LC	LC	Queen Elizabeth National Park, Murchison Falls National Park, Semliki Wildlife Reserve, Ngamba Island, Entebbe Municipality, Ngora District (Eastern Region)							Locally widespread occupying buildings
Little Free-	MOLOSSIDAE	Chaerophon	pumila	LC	LC	Widespread							Locally widespread occupying many buildings

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
tailed Bat	SIDAE	hon											
Peter's Free-tailed Bat, Sierra Leone Mops Bat	MOLOSIDAE	Mops	brachypterus	LC	VU B2ab(iii); D2	Budongo Forest Reserve, Bugala Islands	Small: Widely distributed through sub-Saharan Africa	Tropical lowland forest, roosting in trees, buildings, caves, etc	Disturbance of roosts and fumigation, habitat destruction on Bugala Island	Presumed decline from lack of sightings	Range partially includes at least 1 PA	Confirm presence in Budongo	Tree, Cave and cavity roosting bats concentrate in large numbers, specialized roosting makes vulnerable. Only known from the few localities based on the literature, No recent records for occurrence of the species to permit more accurate assessment. AOO of forest habitat nominally 745km <sup>2</sup> but due to destruction/clearance of forest on Bugala Island is much less
Angolan Free-tailed Bat	MOLOSIDAE	Mops	condylurus	LC	LC	Widespread	Widely distributed through sub-Saharan Africa	Savanna and woodland, caves, cavities and roof spaces	Disturbance of roosts and fumigation	Presumed stable	Partial as present in PA's		Known roosts at the top of Murchison Falls in MFNP. Cave and cavity roosting bats concentrate in large numbers, specialized roosting makes them vulnerable.
Congo Free-tailed Bat, Medje Mops Bat	MOLOSIDAE	Mops	congicus	LC	EN B2ab(iii)	Budongo Forest Reserve	Possibly 20%: Southern Cameroon, DRC, Uganda	Mature tropical lowland moist forest. Colonies roost in hollow trees.	Roost disruption and disturbance	Presume decline as lack of sightings	Range appears to be within PA	Confirm presence in Budongo	May roost in large numbers which makes them vulnerable to mass extinctions. Only known from the few localities based on the literature, No recent sightings to permit accurate assessment. Potential AOO is 470km <sup>2</sup> (forested area of Budongo)
Mongalla Free-tailed Bat, Mongalia Mops Bat	MOLOSIDAE	Mops	demonstrator	LC	VU D2	Gulu District, Moyo District, Wambabya Forest Reserve	Small: Patchy distribution in West, Central to East Africa	Open and dry savanna and Saharan grasslands. May roost in fissures and cracks of tree trunks (including <i>Vitex doniana</i> [Freeman 1981]) and large branches of savanna trees.	Roost site destruction, fire management	Presumed decline from lack of sightings and likelihood of threats eradicating roosts	Little protection although Wambabya is a FR	Confirm presence in Wambabya	Only rarely recorded throughout range and found singly or in very small groups of up to 12 individuals. Wambabya Forest almost entirely degraded. Numbers expected to be very low.
Midas' Giant Free-tailed Bat, Midas Mops Bat	MOLOSIDAE	Mops	midas	LC	VU D2	Budongo Forest Reserve, Wakiso District (Buddo)	Small: West to East and Southern Africa, Madagascar and Arabian Peninsula	open aerial species of woodland and lowland savanna, prefers roosting in total darkness in tree hollows or rock crevices	Known to be hunted and persecuted through range	Presumed decline from lack of sightings and likelihood of threats eradicating roosts	Range appears to be within PA	Confirm presence in Budongo	Only two localities in the literature. Rare throughout range. No recent records are available.
Dwarf Free-tailed Bat, Dwarf Mops Bat	MOLOSIDAE	Mops	nanulus	LC	LC	Budongo Forest Reserve, Kampala Municipality (Kikaaya), Wakiso District (Buddo, Bussu)	Patchy distribution in West, Central to East Africa	Tropical lowland forest habitats. Roosts in small numbers in tree cracks or within man made structures such as thatched houses and sheds	Roost disruption and disturbance	Numbers appear stable	Range partially includes at least 1 PA	Confirm current AOO and status	Frequency of sightings appears to support LC status at present
Railer Free-tailed Bat	MOLOSIDAE	Mops	thersites	LC	LC	Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugala Island, Wakiso District (Buddo, Kabanyolo), Kampala Municipality							
Trevor's Free-tailed Bat	MOLOSIDAE	Mops	trevori	DD	EN B2b(iii)c(ii)	Semuliki National Park, Budongo Forest Reserve, Wakiso District (Bussu)	Possibly 5%: Patchy records West and Central Africa	Recorded in lowland forest, and may be a forest-savanna mosaic specialist.	Affected by forest loss, but roosts within dry wood preferentially selected as fuel	Inferred decline	Range partially within PA system	Confirm presence in Budongo and Semuliki	No recent records available throughout range, likely to have suffered drastic decline

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
								Colonies roost in hollow trees in small numbers.	source and could be affected by fire				
Bini Free-tailed Bat	MOLOSIDAE	Myotis	whitleyi	LC	DD	Entebbe Municipality, Wakiso District (Bussu)	Patchy distribution in West and Central Africa	Tropical moist lowland forest, but possibly marginally occurs in modified habitats.	Almost total conversion of forests where this species was formerly found	Decline	None	Survey in previous sites to confirm presence and commence conservation	Generally considered to be a rare species. Roosts singly or in small numbers. No recent records available. Likely either CR or RE
Martienssen's Free-tailed Bat, Large-eared Free-tailed Bat	MOLOSIDAE	Otomops	martienseni	NT	VU B2ab(iii)	Bwindi Impenetrable National Park (Ruhija), Budongo Forest Reserve	Small: Patchy distribution in much of Sub-Saharan Africa	Wide range of habitats from montane tropical to semi-arid roosting in caves and hollows	Roost disruption and disturbance	Presumed decline from lack of sightings	Range within PA system, reasonably protected	Survey to determine presence/status	Significant decline globally especially East Africa. Cave and cavity roosting bats concentrate in large numbers, specialized roosting makes them vulnerable. No recent records available so presume decline despite no obvious threats in Parks. AOO 791km but very rare so would warrant higher status
Egyptian Free-tailed Bat	MOLOSIDAE	Tadarida	aegyptiaca	LC	LC	Karamoja sub region							
Bate's Slit-faced Bat	NYCTERIDAE	Nycteris	arge	LC	LC	Murchison Falls National Park, Kibale National Park, Semliki National Park (Ntandi), Budongo Forest Reserve	West to central Africa - Uganda as Eastern limit	Forest and woodlands, lake fringing vegetation	Habitat loss and degradation	Stable	Partial as present in Pas		Roost in shrubs in small numbers (3-4), Established presence and recent records within range.
Hairy Slit-faced Bat	NYCTERIDAE	Nycteris	hispidus	LC	LC	Queen Elizabeth National Park (Katwe), Murchison Falls National Park, Rwenzori Mt National Park, Bwindi Impenetrable National Park, Mabira Forest Reserve, Kasese District, Sese Islands,							
Large-eared Slit-faced Bat	NYCTERIDAE	Nycteris	macrotis	LC	LC	Murchison Falls National Park, Sango Bay Forest Reserve, Zoka Forest Reserve, Mabira Forest Reserve, Karamoja Sub-region	West to Eastern Africa and parts of southern Africa	Caves in savanna and woodland	Roost disruption and disturbance	Stable	Partial as present in Pas		Cave roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
Dwarf Slit-faced Bat	NYCTERIDAE	Nycteris	nana	LC	LC	Kibale National Park, Semuliki National Park, Kalinzu Forest Reserve, Mabira Forest Reserve, Bugoma Forest Reserve, Karamoja Sub-region	West, central and eastern Africa	Cavities and herbaceous vegetation in tropical moist forests	Habitat loss and degradation	Stable	Partial as largely present in Forest Reserves	Need better understanding of EOO	Old records from Bwamba, recent records do not include Bwamba. Forms small colonies. AOO less than 2000km2 based on known records, but no evidence of decline or susceptibility to threats
Egyptian Slit-faced Bat	NYCTERIDAE	Nycteris	thebaica	LC	LC	Budongo Forest Reserve, Karamoja Sub-region, Moyo District, Kisoro District, Entebbe Municipality, Eastern (Busia, Mbale, Sukulu-Tororo)							conspecific with N. macrotis. Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
Halcyon Horseshoe Bat	RHINOLOPHIDAE	Rhinolophus	alcyone	LC	LC	Budongo Forest Reserve, Mabira Forest Reserve, Kalinzu Forest Reserve, Kabeyi Cave (Eastern Uganda)	West to central Africa - Uganda as Eastern limit	Cavities in tropical moist forests	Affected by forest loss, but roosts within dry wood preferentially selected as fuel source	Decline inferred, primarily due to forest loss	Partial as largely present in Forest Reserves	Need to establish EOO and AOO. Focus protection including control of fuelwood extraction in these areas.	Thorn and Kerbis 2009 only records presence in Budongo FR. But records from 1990s show presence also in Kibale and Mabira FRs. Cavity roosting bats, in small numbers, but because of the specialized roosting requirements could see populations destroyed by selective extraction of dry wood
Arabian Horseshoe Bat	RHINOLOPHIDAE	Rhinolophus	clivus	LC	LC	Mt Elgon National Park, Soroti District, Karamoja Sub-region, Moyo District							Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
East African Horseshoe	RHINOLOPHIDAE	Rhinolophus	eloquens	LC	LC	Bwindi Impenetrable National Park (Ruhija), Malabigambo							Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements

Proposed National Redlist for Uganda: Evaluated Mammal Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Bat	DAE					Forest Reserve, Budongo Forest Reserve, Busoga District, Kabeyi (Eastern Uganda), Entebbe Municipality, Wakiso District (Bussu)							could see large population destroyed by roost site destruction or alteration
Rueppell's Horseshoe Bat	RHINOLOPHIDAE	Rhinolophus	fumigatus	LC	LC	Sango Bay Forest Reserve, Arua District, Karamoja Sub-region, Sipi Falls (nr Mt Elgon), Entebbe Municipality							Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
Hildebrandt's Horseshoe Bat	RHINOLOPHIDAE	Rhinolophus	hildebrandtii	LC	LC	Widespread - Eastern Uganda, Northern Uganda & Western Uganda							Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
Lander's Horseshoe Bat	RHINOLOPHIDAE	Rhinolophus	landeri	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Kidepo Vally National Park, Karamoja Sub-region (Kabong, Moroto)							Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
Rwenzori Horseshoe Bat	RHINOLOPHIDAE	Rhinolophus	ruwenzorii	VU	DD	Rwenzori Mt National Park, Bwindi Impenetrable National Park	30%: Albertine Rift endemic, Uganda, DRC, Rwanda only	Cavities (including mine shafts) and caves in montane forest	Habitat loss and degradation, roost disturbance	Presumed decline from lack of sightings and likelihood of threats eradicating roosts	Wholly in PAs	Need better understanding of AOO and roost preferences	Assumed to be cave roosting but little known about this species. Very few sightings, specimens. Likely to be in very limited locations within EOO and status unknown
Cape Serotine	VESPERTILIONIDAE	Eptesicus	capensis	LC	LC	Murchison Falls National Park, Masindi District, Isingiro District, Mukono District (Bukalasa), Wakiso District (Katalemwa, Budo)							
Rendall's Serotine	VESPERTILIONIDAE	Eptesicus	rendalli	LC	LC	Murchison Falls National Park, Budongo Forest Reserve, Bugala Island, Hoima District (Buhuka)							
Somali Serotine	VESPERTILIONIDAE	Eptesicus	somalicus	LC	LC	Murchison Falls National Park, Budongo Forest Reserve, Arua District, Masindi District, Wakiso District (Budo, Katalemwa), Karamoja Sub-region							
White-winged Serotine	VESPERTILIONIDAE	Eptesicus	tenuipinnis	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Semuliki National Park, Budongo Forest Reserve, Butiaba (Lake Albert)							
Silvered Butterfly Bat	VESPERTILIONIDAE	Glauconycteris	argentata	LC	DD	Bwindi Impenetrable National Park, Budongo Forest Reserve	Widespread Central and East Africa	Lowland tropical moist forest and moist savanna habitats. It has been recorded roosting in vegetation. Not known if it can tolerate secondary or degraded forest	Forest loss and degradation	inferred decline from habitat requirements	Within reasonably protected areas	Confirm current AOO and status	Very rarely recorded species. Current status not known



**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Bibundi Butterfly Bat	VESPERTILIONIDAE	Glauconycteris	egeria	DD	DD	Budongo Forest Reserve	Only Cameroon, CAR and Uganda	Has been collected in dense secondary forest	Forest degradation				Only Known from 1 forest in Uganda. Recent records are available (Koopman 1993) but roosts have not been found
White-winged Butterfly Bat, Glen's Wattle Bat	VESPERTILIONIDAE	Glauconycteris	gleni	DD	DD	Malabigambo Forest Reserve	Cameroon, Uganda	Lowland tropical moist forest, in small colonies	Forest loss and degradation	Inferred decline	None; Malabigambo poorly protected	Confirm presence and instigate conservation measures if found	This forest has suffered from severe degradation and conversion. Species might not persist.
Allen's Butterfly Bat, Allen's Spotted Bat	VESPERTILIONIDAE	Glauconycteris	humeralis	DD	LC	Bwindi Impenetrable National Park, Kibale National Park, Budongo Forest Reserve, Entebbe Municipality	DRC, Uganda, possibly Kenya	Lowland tropical moist forest. Presumed to roost within hollow trees and dense vegetation					
Variiegated Butterfly Bat	VESPERTILIONIDAE	Glauconycteris	variegata	LC	LC	Murchison Falls National Park, Karuma Wildlife Reserve, Budongo Forest Reserve, Lake Nabugabo, Wakiso District (Budo) Masaka District (Bukakata), Entebbe Municipality							
Copper Woolly Bat	VESPERTILIONIDAE	Kerivoula	cuprosa	DD	DD	Kibale National Park, Bugoma Forest Reserve	Scattered records from West and Central Africa	Moist lowland rainforest, tropical dry forest, and swamp forest.	Threats unknown	Unknown			Species appears rare throughout range. Not otherwise reported for Uganda
De Winton's Long-eared Bat	VESPERTILIONIDAE	Laephotis	wintoni	LC	EN B I ab(iii)	Karamoja Sub-region (Nakiloro)	5%: Eastern Africa	Cavities in dry savanna woodlands	Habitat destruction, fire	Inferred decline	None	Need to establish status of population, range and potential for protection	Only known locality for Uganda from 2004. On account of occurrence in the semi arid Karamoja area, increasing tree stand loss for fuel wood and construction material due to the now increasing sedentary community in area. Old trees with hollows being cut away
Moloney's Flat-headed Bat	VESPERTILIONIDAE	Mimetillus	moloneyi	LC	LC	Kibale National Park, Murchison Falls National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Moyo District							
Lesser Long-fingered Bat	VESPERTILIONIDAE	Miniopterus	fraterculus	LC	DD	Busia District	Central, East to Southern Africa	Wide range of habitats. Roosts in caves, overhangs, disused mines, railway tunnels and similar habitats					Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration. Record indicated, but otherwise not listed for Uganda
Greater Long-fingered Bat	VESPERTILIONIDAE	Miniopterus	inflatus	LC	LC	Rwenzori Mt National Park, Bwindi Impenetrable National Park, Busia District, Tororo District							Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
	VESPERTILIONIDAE	Miniopterus	natalensis	LC	LC	Busia District, Kabei Cave (Eastern Uganda), Zoka Forest Reserve							Cave and cavity roosting bats, where they may concentrate in large numbers, but because of the specialized roosting requirements could see large population destroyed by roost site destruction or alteration
Rufous Mouse-eared	VESPERTILION	Myotis	bocagei	LC	LC	Bwindi Impenetrable National Park (Buhoma), Budongo Forest							



Proposed National Redlist for Uganda: Evaluated Mammal Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Bat	IDAE					Reserve, Ssese Islands, Entebbe Municipality, Kampala Municipality, Fort Portal Municipality, Moyo District							
Cape Hairy Bat, Temminck's Mouse-eared Bat	VESPERTILIONIDAE	Myotis	tricolor	LC	DD	Sipi Falls- Chema cave	Patchy distribution in much of Sub-Saharan Africa	Known to roost in caves and abandoned mines					Single location presence needs to be confirmed
Welwitsch's Bat	VESPERTILIONIDAE	Myotis	welwitschii	LC	LC	Murchison Falls National Park, Rwenzori Mt National Park, Budongo Forest Reserve							
Schlieffen's Bat	VESPERTILIONIDAE	Nycticeinops	schlieffenii	LC	LC	Zoka Forest Reserve, Soroti District							
Broad-headed Pipistrelle	VESPERTILIONIDAE	Pipistrellus	crassulus	LC	DD	Semuliki National Park, Budongo Forest Reserve	Widespread but rarely recorded through West to East Africa	Montane and lowland tropical moist forest, and lowland tropical dry forest.					No recent recordings
Eisentraut's Pipistrelle	VESPERTILIONIDAE	Pipistrellus	eisentrauti	DD	DD	Kalinzu Forest Reserve, Budongo Forest Reserve	Cameroon, possibly Kenya, DRC, Uganda and Somalia	Montane and lowland tropical moist forest, and possibly from tropical dry forest					No recent recordings
	VESPERTILIONIDAE	Pipistrellus	guineensis	LC	LC	Murchison Falls National Park, Nakapiripirit District (Amdat), Soroti District							
Savanna Pipistrelle, Samburu Pipistrelle	VESPERTILIONIDAE	Neoromicia	helios	DD	CR B2ab(iii)	Hoima District (Buhamba)	Everywhere rare, could be significant: East Africa	Unknown, presume forest	Habitat degradation and conversion.	infer decline due to habitat loss	None - not in protected area	urgent study to ascertain status of very rare bat	Very little known about this bat, and appears to be everywhere rare. Could easily be confused with P. nanus which it resembles. We have a recent specimen from Buhamba so presume single location in remnant forests of Albertine Rift
	VESPERTILIONIDAE	Pipistrellus	hisperidus	LC	LC	Murchison Falls National Park, Bwindi Impenetrable National Park, Mt Elgon National Park, Budongo Forest Reserve, Echuya Forest Reserve							IUCN page notes, this species was separated from P. kuhli by Kock (2001) and that further surveys were needed to determine range of the two species.
Pygmy Pipistrelle	VESPERTILIONIDAE	Pipistrellus	nanulus	LC	LC	Queen Elizabeth National Park, Budongo Forest Reserve, Kampala Municipality, Wakiso District (Katalemwa, Kabanyolo)							
Banana Bat	VESPERTILIONIDAE	Pipistrellus	nanus	LC	LC	Kibale National Park, Bwindi Impenetrable National Park, Murchison Falls National Park, Rwenzori Mt National Park, Queen Elizabeth National Park, Budongo Forest Reserve, Ssese Islands, Kigezi Wildlife Reserve, Kampala Municipality							
Rueppell's Bat	VESPERTILIONIDAE	Pipistrellus	rueppellii	LC	LC	QENP, Lake Edward, Entebbe, Ssese Islands, Masaka, Buhuka							
Rusty Bat	VESPERTILIONIDAE	Pipistrellus	rusticus	LC	LC	Budongo, Karamoja-Nakilororo							

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
	IDAE												
Light-winged Lesser House Bat	VESPERTILIONIDAE	Scotoecus	albofuscus	DD	DD	Moyo District	Patchy distribution in West, Central to East Africa	Woodlands and dry savanna	Unknown	Unknown	None	Survey to understand current status	Single site known in Uganda for this rare species
Thomas' Lesser House Bat	VESPERTILIONIDAE	Scotoecus	hindei	LC	LC	Murchison Falls National Park, Karamoja Sub-region, Mbale District (Nabumali), Hoima District (Buhuka), Kampala Municipality							
Dark-winged Lesser House Bat	VESPERTILIONIDAE	Scotoecus	hirundo	LC	LC	Queen Elizabeth National Park, Budongo Forest Reserve, Bukasa Island, Wakiso District (Kabanyoro)							
African Yellow House Bat	VESPERTILIONIDAE	Scotophilus	dinganii	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Budongo Forest Reserve, Soroti District, Karamoja Sub-region, Gulu District, Moyo District							
Northern Lesser House Bat, White-bellied Yellow Bat	VESPERTILIONIDAE	Scotophilus	leucogaster	LC	VU D2	Mt Kei Forest Reserve, Zoka Forest Reserve	Small: West, Central and Eastern Africa	Dry and moist savanna habitats	Unknown, presumed habitat degradation and loss	Unknown	Little protection although within PA system	Survey to better understand AOO and status	Little is known about the ecology and threats to this bat but its distribution in Uganda is limited to two small forests neither of which is well protected.
African Giant House Bat	VESPERTILIONIDAE	Scotophilus	nigrita	LC	LC	Budongo Forest Reserve, Zoka Forest Reserve, Moyo District (Metu)							
Forest Brown House Bat	VESPERTILIONIDAE	Scotophilus	nux	LC	LC	Bwindi Impenetrable National Park, Kibale National Park, Budongo Forest Reserve							
Plains Zebra	EQUIDAE	Equus	quagga	EN A2ac; C2a(i)	NT	Lake Mburo National Park, Ankole Ranches, Kidepo Valley National Park, Pian Upe Wildlife Reserve, Kobebe (Moroto District)	2%: East to Southern Africa	All habitats up to 4300m	Habitat loss through fencing, competition, disease	Increasing	Reasonably well-protected within PA system	Establish correct numbers in Lake Mburo National Park	Kidepo, Karenga total individuals 425 (WCS 2014), Lake Mburo 11000 in 2010 (UWA) but concern that these figures may be high. Some expectation that fencing of ranches around Lake Mburo could lead to reduced numbers
Square-lipped/White Rhinoceros	RHINOCEROTIDAE	Ceratotherium	simum	NT	RE								
Black Rhinoceros	RHINOCEROTIDAE	Diceros	bicornis	CR	RE								
Long-tailed Pangolin, Black-bellied Pangolin	MANIDAE	Phataginus	tetractyla	VU (A4d)	EN B2ab(iii,v)	Semliki National Park	Small: West and Central Africa	Forest	Hunting for bush meat and trade in parts	Decline	Range within protected areas, poor protection against hunting	Control international poaching and cease legal trade	This species is only known to occur in Semliki. Pressures as for all Pangolins with international trade in very high numbers
Tree Pangolin, White-bellied Pangolin	MANIDAE	Phataginus	tricuspis	VU (A4d)	VU A2d	Bwindi Impenetrable National Park, Queen Elizabeth National Park, Mabira Forest Reserve, Budongo Forest Reserve, Kibale National Park	Small: West, Central and Eastern Africa	Forest and woodland	Hunting for bush meat and trade in parts	Maybe declining	Range within protected areas, poor protection against hunting	Control international poaching and cease legal trade	Species may occur in other forest reserves of Uganda. Regardless of this, it is targeted for bushmeat and international trade in animal parts and declining rapidly
Giant Pangolin, Giant Ground	MANIDAE	Smutsia	gigantea	VU (A4d)	VU A2d	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, Lake Albert, Migadde (Gayaza)	Unknown: West and Central Africa	Savanna	Hunting for bush meat and trade in parts	Declining rapidly	Range within protected areas, poor protection against hunting	Control international poaching and cease legal trade	The Migadde Observation in the Mid-1990s would suggest the species was probably widespread in the country. It now very likely only survives in good populations within the Protected areas. International trade in very high numbers is giving cause for concern.

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Pangolin						District), Kibale National Park							(reported 1,000,000 USH reward per animal in 2012)
Ground Pangolin, Temminck's Ground Pangolin	MANIDAE	Smutsia	temminckii	VU (A4d)	VU A2d	Murchison Falls National Park, Kidepo Valley National Park	Small: Sub-Saharan Africa	Savanna	Hunting for bush meat and trade in parts	Declining rapidly	Range within protected areas, poor protection against hunting	Control international poaching and cease legal trade	It now very likely only survives in good populations within the Protected areas. International trade in very high numbers is giving cause for concern.
Vervet Monkey	CERCOPITHECIDAE	Cercopithecus	aethiops	LC	LC	Widely occurring							
Schmidt's Red-tailed Monkey	CERCOPITHECIDAE	Cercopithecus	ascanius	LC	LC	Widely occurring Bwindi Impenetrable National Park, Kibale National Park, Mabira Forest, Kalinzu-Maramagambo Forest Reserve, Malabigambo Forest Reserve							
Lhoest's Monkey	CERCOPITHECIDAE	Cercopithecus	lhoesti	VU	NT	Bwindi Impenetrable National Park, Kibale National Park, Queen Elizabeth National Park, Rwenzori Mt National Park, Kasyoha-Kitomi Forest Reserve	>10%: Burundi, DRC, Uganda, Rwanda	Lowland, sub-montane and montane forest	Habitat loss and degradation, conflict (crop-raiding)	Decline	Populations occur in Protected areas	Establish current population status	Only in a few localities in the country, but whilst numbers are reducing core areas still have reasonable protection
Blue Monkey	CERCOPITHECIDAE	Cercopithecus	mitis	LC	LC	Kibale National Park, Bwindi Impenetrable National Park, Rwenzori Mt National Park, Mt Elgon National Park, Budongo Forest Reserve, Mgahinga Forest Reserve							
De Brazza's Monkey	CERCOPITHECIDAE	Cercopithecus	neglectus	LC	VU D2	Semliiki National Park, Mt Elgon National Park	10% Uganda: Central to East Africa	Forest	Habitat loss and degradation	Decline inferred, primarily due to forest loss	Range within Protected areas, Elgon forests heavily degraded	Establish current population status in Semliki and protect this core area	2 locations only and Elgon under pressure
Angolan Colobus	CERCOPITHECIDAE	Colobus	angolensis	LC	VU D2	Rwenzori National Park, Sango Bay forests	<10%: Central to East Africa	Forest	Habitat loss and degradation	Decline, primarily due to forest loss	Range within PA system but Sango Bay forests largely converted/degraded	Establish current population status in Rwenzori and protect this core area	2 locations and Sango Bay under severe pressure
Guereza Colobus, black and white colobus	CERCOPITHECIDAE	Colobus	guereza	LC	LC	Widespread throughout National Parks in Uganda							
Patas Monkey	CERCOPITHECIDAE	Erythrocebus	patas	LC	LC	Murchison Falls National Park, Karamoja sub region, Zoka Forest Reserve, Mt Kei Forest Reserve							
Uganda Mangabey	CERCOPITHECIDAE	Lophocebus	ugandai	LC	VU A2c	Kibale National Park, Bugoma Forest Reserve, Mabira Forest Reserve, Mpanga Forest Reserve, Sango Bay Forest Reserve, Mukono District (Bujuko), Wakiso District (Bukasa)	100%	Forest	Habitat loss and degradation	infer decline due to habitat loss	Range partially within PA system, many forests rapidly being degraded or converted	Establish conservation of endemic species and control habitat loss in core areas	Recent paper (2007) puts the species in Uganda as a separate species distinct from the grey-cheeked Mangabey
Olive Baboon	CERCOPITHECIDAE	Papio	anubis	LC	LC	Widely occurring							
Uganda Bay Colobus	CERCOPITHECIDAE	Procolobus	tephrosceles	EN	EN B1 ab(iii)	Kibale National Park	>60%: Uganda, Tanzania	Forest	Hunting by chimpanzees reducing	Inferred decline	Range within PA system, reasonably protected	Ensure each of populations is stable and monitor	Single site so EOO very limited. Habitat degradation within forests gives plausible threat of decline. Population size 30,000 in 5 separate populations. Extinct from some of Tanzanian range with

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
									numbers.			reductions	Kibale largest population
Dwarf Galago	GALAGONIDAE	Galago	demidoff	LC	LC	Lake Mburo National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Kibale National Park							No uptodate occurrence and population data available
Matschie's Galago, Spectacled Lesser Galago	GALAGONIDAE	Galago	matschiei	LC	DD	Kibale National Park, Bwindi Impenetrable National Park, Mpanga Forest Reserve, possibly Budongo Forest Reserve	Albertine Rift, Uganda, DRC	Primary and secondary tropical lowland and submontane forest; especially where Parinari excelsa is the dominant tree	Habitat loss and degradation	Declining	Range within PA system, some poorly protected from degradation	Decline not well understood, study current status	No up to date occurrence and population data available
Senegal Galago	GALAGONIDAE	Galago	senegalensis	LC	LC	Lake Mburo National Park, Queen Elizabeth National Park, Murchison Falls National Park, Kidepo Valley National Park							No uptodate occurrence and population data available
Thomas's Galago	GALAGONIDAE	Galagoides	thomasi	LC	DD	Bwindi Impenetrable National Park, Kibale National Park, Budongo Forest Reserve	West and Central Africa	Dense high montane forest. Avoids grasslands	Threatened by habitat loss as tends to be on forest margins	Inferred decline	Range within PA's	Exact habitat preference to be investigated to ensure protections	No uptodate occurrence and population data available
Potto	LORIDAE	Perodicticus	potto	LC	LC	Kibale National Park, Bwindi Impenetrable National Park, Queen Elizabeth National Park, Mabira Forest Reserve							
Mountain Gorilla	PONGIDAE	Gorilla	gorilla	EN(A4abcd)	EN D	Mgahinga Gorilla National Park, Bwindi Impenetrable National Park	45% (only Rwanda Uganda and DRC)	Montane forest 1600 - 4500m	International trade in live animals (infants) and body parts, incidental snaring. Habitat fragmentation from roads, Disease	Increasing	Ugandan population well protected	Continue monitoring population, exposure to disease, cross-border movements	Permanent population in Bwindi, Mgahinga fluctuates and currently no resident population. Affected by cross border movements. Total population estimated at 400 (2011, UWA), population size likely to be +/- 50%. Population increasing, population estimated at 150 in 1982, 300 in 1990 (total population) so mature individuals less than 250.
Common Chimpanzee	PONGIDAE	Pan	troglydotes	EN	EN A4c	Found in nearly all Albertine Rift forest (except Echuya)	2-3%: Pan-tropical Africa	Forest and woodlands	Incidental snares, hunting infants, conflict with humans, forest loss.	Decline primarily due to forest loss	Range partially within Protected Area system	Better protection of forest and woodland habitats outside PA's and control of indiscriminate snaring	Survival largely tied to maintaining adequate extent of preferred habitats. Wide ranging landscape species, needs maintenance of corridors for genetic mixing, populations within any one forest block not considered to be viable. Total population estimate of 5000 in 2002, but some remnant populations only as forest outside PA's rapidly lost. Forest blocks show 50% reduction in forest cover over 3 generations (150 years)
African Elephant	ELEPHANTIDAE	Loxodonta	africana	VU	CR A4a	Murchison Falls National Park, Queen Elizabeth National Park, Kibale National Park, Kidepo Valley National Park, Bwindi Impenetrable National Park, Semuliki National Park, Toro-Semliki Wildlife Reserve	1%: Sub-Saharan Africa	All habitats	Snares, international trade, conflict with humans	Have been stable for a few years but massive reductions within last 3 generations and decline expected to increase again	Range partially within Protected Area system		Much reduced populations now largely confined in the Protected areas where numbers are a fraction of those of 40-50 years ago. Very small numbers outside of the 3 major parks and poaching pressures for ivory continue and are expected to increase in Uganda in the future in line with other countries
Beecroft's Flying Squirrel	ANOMALURIDAE	Anomalurus	beecrofti	LC	NT	Semuliki National Park, Kibale National Park	Small: West and Central Africa						Would presume LC in absence of threats but only in two PA's so if numbers low could be at risk as population size not known
Lord Derby's Flying Squirrel	ANOMALURIDAE	Anomalurus	derbianus	LC	LC	Bwindi Impenetrable National Park, Mt Elgon National Park, Budongo Forest Reserve,							

Proposed National Redlist for Uganda: Evaluated Mammal Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
						Entebbe Municipality, Kabarole District, Kibale National Park							
African Dwarf Flying Squirrel, Pygmy Scaly-tailed Flying Squirrel	ANOMALURIDAE	Idiurus	zenkeri	LC	NT	Semuliki National Park, Budongo Forest Reserve	Small: Central Africa	Lowland and montane tropical moist forest	Habitat loss and degradation	Presume stable	Range within PA system, reasonably protected	Need to establish status of population, range and potential for protection	Would presume LC in absence of threats but only in two PA's so if numbers low could be at risk as population size not known
White-toothed Mole-rat	BATHYERGIDAE	Cryptomys	ochraceocinereus	LC	LC	Kacheri, Karamoja, Lira, Lango, Teso, Arua							
Savanna Pouched Rat	CRICETIDAE	Cricetomys	emini	LC	LC	Wide spread in country							
Forest Pouched Rat	CRICETIDAE	Cricetomys	gambianus	LC	LC	Widely occurring in Ugandan forests inc. Mabira Forest Reserve, Budongo Forest Reserve, Kibale Forest Reserve							
Delany's Mouse	CRICETIDAE	Delanymys	brooksi	VU	CR B1ab(ii,iii,v)	South Western; Echuya Forest Reserve	20%: Albertine Rift endemic DRC, Uganda, Rwanda, Burundi but very confined	High altitude swamp 1700-2400m	Habitat loss and degradation	Decline	Range partially within PA, poorly protected	Establish abundance and status	Very rare throughout range and known to be in decline
Montane Climbing Mouse	CRICETIDAE	Dendromys	insignis	LC	LC								More recent data required
Rwenzori Climbing Mouse, Kivu African Climbing Mouse	CRICETIDAE	Dendromys	kivu	LC	VU D2	Rwenzori Mt National Park	10-15%: Albertine Rift endemic DRC, Uganda, Rwanda, Burundi but very confined	Grassland and disturbed habitat in moist dense vegetation 1300-4000m	Habitat degradation	Presume stable	Range within PA, reasonably protected	Establish abundance and status	Only a single locality known for the species in the country. More recent data required
Grey Climbing Mouse	CRICETIDAE	Dendromys	melanotis	LC	LC	Nabumali, Butiaba, Hoima, KVNP, Karamoja, West Nile							More recent data required
Brant's Climbing Mouse	CRICETIDAE	Dendromys	mesomelas	LC	LC	Echuya Swamp, Kumba, Kigezi, Mubuku Valley							More recent data required
Chestnut Climbing Mouse	CRICETIDAE	Dendromys	mystacalis	LC	LC	Budadiri Camp, Bugisu; Hoima, Kajuia, Masindi. Bunyoro; Kamchuru, Karamoja; Buligi, Mubende; Sebei Camp, Sebei; Bubukwanga, Bugoye, Bumatta, Bummaddu, Bundibugyo, Bunclimali, Fort Portal, Humya, Kyabombo,							More recent data required
Congo Forest Mouse	CRICETIDAE	Deomys	ferrugineus	LC	LC	Semliki National Park, Bugoma Forest Reserve, Budongo Forest Reserve, Mabira Forest Reserve							
Crested Rat	CRICETIDAE	Lophiomys	imhausi	LC	VU D2	Mt Moroto National Park	5%: Eastern Africa	Variety of habitats	Unknown, presumed habitat degradation and loss	Unknown	Range appears to be within PA	Review status to understand EOO (whether it occurs beyond Moroto), abundance	Only in one geographical region of the country. No recent specimens seen, only record is that in Delany (1975)

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Barbour's Vlei Rat	CRICETIDAE	Otomys	barbouri	EN	EN BI+2ab(iii)(ii,iv)	Mt. Elgon	<50%: Uganda, Kenya	Alpine heaths above 3300m	Burning causes wide fluctuations in numbers, habitat degradation	Decline, fluctuating	Range within PA	Control fire management regime and uncontrolled fires	Only known from Mt Elgon where tourism is eroding habitat as well as uncontrolled and regular burning.
Montane Groove-toothed Rat, Dent's Vlei Rat	CRICETIDAE	Otomys	denti	LC	LC	Mabira Forest, Echuya Swamp and Forest, Kibale Forest, Mubuku Valley							
Tropical Groove-toothed Rat	CRICETIDAE	Otomys	tropicalis	LC	LC	Widely occurring							We take this to be equivalent to <i>Otomys irroratus</i> in Delany 1975 as this name ( <i>O irroratus</i> ) is confined to South African forms
Northern Groove-toothed Rat	CRICETIDAE	Otomys	typus	LC	VU D2	Rwenzori NP, Elgon NP	10-20%: Ethiopia, Kenya, Uganda, Tanzania, Malawi	Montane grasslands and alpine heath	Possible loss of habitat extent and/or quality, burning, grazing, trampling (tourism)	Unknown but probably decline	Known Populations are in Protected areas	Establish status	Species known from only two localities
East African Pouched Mouse Pouched Mouse	CRICETIDAE	Saccostomus	mearnsi	LC	VU D2	Karamoja, Kapchorwa	5-10%: Ethiopia, Kenya, Somalia, Uganda, Tanzania	Dry savanna grassland systems	Habitat degradation, burning, grazing	Inferred decline	None	Establish AOO	Delany (1975) lists <i>Saccostomus campestris</i> as occurring in Uganda, but Kingdon <i>et al.</i> (2013) show <i>campestris</i> as a Southern African form and <i>mearnsi</i> as the eastern African form. We adopt this taxonomy.
Pygmy Fat Mouse	CRICETIDAE	Steatomys	parvus	LC	LC	Karamoja Sub region							
Boehm's Gerbil	GERBILIDAE	Gerbilliscus	boehmi	LC	LC	Burumba, Lake Nakivali, Ankole							
Savanna Woodland Gerbil	GERBILIDAE	Gerbilliscus	leucogaster	LC	DD	Unknown	East and Southern Africa	Bushland and grassland	Unknown	Unknown	Unknown		Reservoir species for Bubonic plague. No location data available
Black-tailed Gerbil	GERBILIDAE	Gerbilliscus	nigricauda	LC	LC	Amudat, Lotome, Nakiloro - Karamoja sub-region							
Fringe-tailed Gerbil	GERBILIDAE	Gerbilliscus	robustus	LC	DD	Unknown	Central to East Africa	Savanna, open grassland, arable	Unknown	Unknown	Unknown		No location data available
Northern Savanna Gerbil	GERBILIDAE	Gerbilliscus	valida	LC	LC	Atiak, Awack, Gulu, Kitgum, Acholi, Kalinzu, Maramagambo							
Emin's Gerbil	GERBILIDAE	Taterillus	emini	LC	LC	Mt Kei Fr, Zoka Fr, Acholi, Karamoja, Teso, West Nile							
African Brush-tailed Porcupine	HYSTRICIDAE	Atherurus	africanus	LC	LC	Murchison Falls National Park, Bwindi Impenetrable Park, Mabira Fr, Kalinzu Fr, Maramagambo Fr, Sango Bay Fr							
South African Porcupine	HYSTRICIDAE	Hystrix	africaeustralis	LC	LC	Mgahinga, Possibly wide spread in Kigezi							Only available report is from Delany 1975
Crested Porcupine	HYSTRICIDAE	Hystrix	cristata	LC	LC	Widely occurring							
Sahel Spiny Mouse	MURIDAE	Acomys	cineraceus	LC	LC	Drier areas of Northern Uganda							
Grey Spiny Mouse	MURIDAE	Acomys	percivali	LC	LC	Kotido, Lopiliongor, Namalu, Karamoja							
Pygmy Spiny	MURIDAE	Acomys	wilsoni	LC	LC	Amudat, Kachere, Kananrok,							



**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Mouse	AE					Lorengiki, Lotome, Manimani, Moroto Forest, Nabilatuk							
Northern Bush Rat	MURID AE	Aethomys	hindei	LC	LC	Acholi, Bukedi, Bunyoro, Busoga, Buganda, Karamoja, Masaka, Mubende							
Kaiser's Bush Rat	MURID AE	Aethomys	kaiseri	LC	LC	Mbarara, Ishasha, QENP, Mgahinga, Rakai, Tooro							
Nile Grass Rat	MURID AE	Arvicantis	niloticus	LC	LC	Kamapala area, MFNP, QENP, LMNP, Sango Savannas, Karamoja Subregion, Mt Kei Fr, Zoka Fr							Widely occurring in grassland ecosystems
Velvet Rat, African Wading Rat	MURID AE	Colomys	goslingi	LC	NT	Semuliki National Park, Bwindi Impenetrable National Park, Echuya Forest Reserve	Possibly 1-2%: Central Africa	Rainforest and forest-savanna mosaic	Loss in quality and extent of preferred habitat	May be stable	Known to currently occur within protected areas	Assess abundance	Forest interior species with narrow habitat preferences near water courses or swamp forest could be susceptible to forest degradation
Shaggy Marsh Rat	MURID AE	Dasymys	incomtus	LC	LC	Sese Islands, Acholi region, Ankole, Bekedi, Bunyoro, Kigezi, Madi, Masaka, Teso, Tooro							
Montane Marsh Rat, Montane Shaggy Rat	MURID AE	Dasymys	montanus	EN	EN B1ab(iii)	Rwenzori Mt National Park	Presumed 100% Uganda	Montane tropical forest, montane grassland and wetlands 2600-3800m.	Habitat degradation	Presumed decline from lack of sightings	Range within PA system, reasonably protected	Assess status and abundance	According to Kingdon <i>et al</i> 2013, the species is endemic to Rwenzori Mts, specimens only known from the Ugandan side but may occur on the Congo side. Has a very small geographic distribution but with the high altitude habitats where it occurs relatively un affected by human activities. Assumed very small numbers
Common Thicket Rat	MURID AE	Grammomys	dolichurus	LC	LC	MFNP, Mabira Fr, Sango Bay Forests, Bukakata Forests, Sese Island forests,		Widely occurring in forest edge, Woodland, bushland and post cultivation habitats					
Montane Thicket Rat, Forest Thicket Rat	MURID AE	Grammomys	dryas	NT	VU D2	Rwenzori Mt National Park, Bwindi Impenetrable National Park	30%: Albertine Rift endemic DRC, Uganda, Burundi but very confined	Montane tropical moist forests - not in disturbed or modified habitats	Unknown	Presumed decline from lack of sightings	Range within PA, reasonably protected	Assess status and abundance	Endemic to the Albertine Rift region of Africa. Occurs in very small numbers
Osgood's Thicket Rat, Ruwenzori Thicket Rat	MURID AE	Grammomys	ibeanus	LC	DD	Mt Elgon, possibly Mt Otzi Forest Reserve	Scattered localities East Africa from South Sudan to Zambia, Malawi						Kingdon <i>et al</i> 2013, mention records of the species from various localities emphasizing Mt Elgon, but with a map suggesting it may extend from the Imatongs of South Sudan into Mt Otzi in Uganda.
Macmillan's Thicket Rat	MURID AE	Grammomys	macmillani	LC	DD	Possibly extends into Northern Uganda	Central to East Africa	forests, riverine forest, forest edges, swamps and grasslands with trees					Kingdon <i>et al</i> 2013 map it as a having a geographical distribution into Northern Uganda. We have no materials to confirm this
Arboreal Thicket Rat	MURID AE	Grammomys	rutilans	LC	LC	Bugoma Fr, Mayanja Fr, Zika Fr,							
Ruwenzori Striped Mouse	MURID AE	Hybomys	lunaris	VU	VU D2	Rwenzori Mt National Park	~50% : DRC, Uganda.	Tropical montane forest 1830-2400m	Unknown but restricted range makes vulnerable to threats	Presume stable	Range within PA, reasonably protected	Assess status and abundance	Endemic to the Albertine rift region, where it is retracted to Rwenzori Mts
Peters' Striped Mouse	MURID AE	Hybomys	univittatus	LC	LC	Mabira Fr, Budongo Fr, Kalinzu, Maramagambo, Katshoya Kitomi, Kiballe NP		Forest					
Large Wood Mouse	MURID AE	Hylomyscus	aeta	LC	LC	Western Uganda Forests		Forest					

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
East African Montane Wood Mouse	MURIDAE	Hylomyscus	denniae	LC	LC	Rwenzori NP, Bwindi IMP, Mgahinga, Echuya		Montane forest					
Stella Wood Mouse	MURIDAE	Hylomyscus	stella	LC	LC	Mabira Fr Kibale NP, Kalinzu Maramagambo FR, Sango Bay Frs, Bukakata Frs		Low to mid altitude forest					
Barbary Striped Grass Rat	MURIDAE	Lemniscomys	barbarus	LC	LC	Acholi, MFNP, Kaiso, Kidepo, Karamoja, Teso, West Nile							
Obscure Striped Grass Rat	MURIDAE	Lemniscomys	macculuss	LC	LC	Acholi, Bugisu, East Mengo, Kidepo, Mubende, QENP, West Nile							
Common Striped Grass Rat	MURIDAE	Lemniscomys	striatus	LC	LC	Kampala area, QENP, LMNP, MFNP, Sango Bay and Nabugabo Grasslands, Karamoja area		Savanna and grassland systems					
Eastern Brush-furred Rat	MURIDAE	Lophuromys	flavopunctatus	LC	LC	Kampala area, Sango Bay and Nabugabo forests, Kibale NP, Mabira Fr, Kalinzu Maramagambo Frs, Jkatshoya kitomi		Widely occurring in forests and moist savannas					
Common Brush-furred Rat	MURIDAE	Lophuromys	sikapusi	LC	LC	Kampala area, Sango Bay and Nabugabo forests, Kibale NP, Mabira Fr, Kalinzu Maramagambo Frs, Jkatshoya kitomi		Widely occurring in savannas and forest edge					
Woosnam's Brush-furred Rat	MURIDAE	Lophuromys	woosnami	LC	LC	Rwenzori MNP, Bwindi INP, Katshoha Kitomi		High elevation forest					
Long-footed Rat	MURIDAE	Malacomys	longipes	LC	LC	Mabira Fr, Kalinzu Fr, Maramagambo Fr, Malabigambo Fr, Kibale NP, Semuliki Fr, Itwara Fr		Widely occurring in low and mid elevation forests with a preference for water courses and swamp in the forest					
Northern Savanna Multimammate Rat	MURIDAE	Mastomys	natalensis	LC	LC	Kampala area, MFNP, QENP, LMNP, Zoka, Mt Kei Fr, Karamoja su region, West Nile							Wilson & Reeder (2005) and Kingdon <i>et al</i> 2013 regard this a synonym of natalensis. Kingdon <i>et al</i> (2013) in addition map the distribution as very wide in sub-saharan Africa.
Western Rift Pygmy Mouse	MURIDAE	Mus	bufo	LC	LC	Rwenzori MNP, Bwindi INP, Katshoha Kitomi		High elevation forest					
Ethiopian Pygmy Mouse, Mahomet Mouse	MURIDAE	Mus	mahomet	LC	DD	Unknown	Kenya, Ethiopia, Eritrea, Uganda	Montane forests, scrublands and grasslands 1500-3400m	Unknown	Unknown	Unknown		More recent data needed and location records
Common House Mouse	MURIDAE	Mus	musculus	LC	LC	Widely occurring in Human habitattion							
Peters' Pygmy Mouse	MURIDAE	Mus	setulosus	LC	DD	Unknown	West and Central Africa		Unknown	Unknown	Unknown		More recent data needed and location records
Mount Elgon Pygmy	MURIDAE	Mus	sorella	LC	DD	Unknown	DRC, Tanzania, Kenya, Uganda	Open clearings in lowland and	Unknown	Unknown	Unknown		More recent data needed and location records

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Mouse								montane forest, and also within savanna areas					
Grey-bellied Pygmy Mouse	MURIDAE	Mus	triton	LC	LC	Western Uganda savanna systems		Grassland					
Three-toed Grass Rat	MURIDAE	Mylomys	dybowskii	LC	LC	North of Maramagambo Forest, Bugisu, Bukedi, Mabira Fr							
African Meadow Rat	MURIDAE	Myomys	fumatus	LC	LC	Northern Uganda		Savanna systems					
Rusty-nosed Rat	MURIDAE	Oenomys	hypoxanthus	LC	LC	Mabira Fr, Malabigambo Fr, Kalinzu Fr, Maramagambo Fr, Kiblae Np, Semuliki Fr		Forest					
Common Creek Rat, Creek Groove-toothed Swamp Rat	MURIDAE	Pelomys	fallax	LC	DD	Ankole, Kigezi	Central to Southern Africa	Cultivated lands					
Papyrus Rat	MURIDAE	Pelomys	hopkinsi	DD	LC	Kigezi - Rwamachuchu, Wetlands fringing Lake Victoria and Lake Albert		Areas of wetland and seasonal inundation fringing the lakes					
Lake Victoria Rat, Issel's Groove-toothed Swamp Rat	MURIDAE	Pelomys	isseli	DD	CR B1ab(ii,iii,iv)	Ssesse and Koome Islands	100%	Abandoned farmland, it has not been recorded from natural grassland or forest.	Habitat destruction, fire, resumed agriculture	Decline	No protection	Improved wetland conservation and survey Area of Occupancy	Only known extent of occurrence are the Ugandan Lake Victoria Islands a fair amount of which have been converted for palm oil growing. The remaining AOO is estimated to be less than 100km <sup>2</sup> , the area of occupancy within this is currently unknown but declining. Need to calculate total EOO based on Ssesse island area.
De Graaff's Praomys	MURIDAE	Praomys	degraaffi	VU	EN B2ab(iii)	Bwindi Impenetrable National Park, Echuya Forest Reserve	>50%: Albertine Rift in Burundi, Rwanda, Uganda	Undisturbed moist montane forest 1900-2600	Habitat loss and degradation	Decline	Range appears to be within PA	Define AOO within Bwindi and ensure conservation	High altitude Montane Forest including thick bamboo stands and dense herbaceous growth. Can be locally abundant. AOO 356km <sup>2</sup> . Suitable habitat mostly cleared in Rwanda so Ugandan population crucial
Jackson's Soft-furred Rat	MURIDAE	Praomys	jacksoni	LC	LC	Mabira Fr, Kibale NP, Budongo Fr, Kalinzu Fr, Maramagambo Fr, Malabigambo Fr, Ssesse Island Forests		Forest					
Black Rat	MURIDAE	Rattus	rattus	LC	LC	Widely occurring		Widely occurring					
Four-striped Grass Mouse	MURIDAE	Rhabdomys	pumilio	LC	VU B1ab(iii)	Mt Elgon National Park	Small: Sub-Saharan Africa	Montane grassland, swamp and afroalpine habitats	Fire	Decline	Mt Elgon is a Protected National Park		Mount Elgon has the only Ugandan population, any suitable habitats outside the Parks boundary will already have been lost to agriculture and pressure occurs within the Park (elsewhere abundant).
Long-tailed Forest Rat	MURIDAE	Stochomys	longicaudatus	LC	LC	Semuliki National Park, Bwindi Impenetrable National Park		A rain forest Murid					
Kemp's Forest Rat	MURIDAE	Thamnomys	kempi	VU	LC	South Western Uganda							
Montane Forest Rat, Charming Thicket Rat	MURIDAE	Thamnomys	venustus	VU	DD	Rwenzori Mt National Park, Kigezi District	30%: DRC, Uganda	Thickets in montane primary and secondary forest 1800-3000m	Conversion, habitat degradation	Decline	Range partially within a reasonably protected PA	Survey to understand AOO, status esp Kigezi	Not recorded recently, poorly protected outside of Rwenzori and likely to be declining rapidly
Rudd's Mouse	MURIDAE	Uranomys	ruddi	LC	LC	Bugisu, Bukedi, Acholi, Mubende Districts							

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Broad-headed Mouse	MURIDAE	Zelotomys	hildegardae	LC	LC	Ankole District, Crater area Kabarole District, West Nile sub-region							
African Common Dormouse	MYODONTOMIDAE	Graphiurus	murinus	LC	LC	Kibale National Park, Murchison Falls National Park, Kalinzu Forest Reserve, Mabira Forest Reserve		Forest, savanna and agricultural areas					
Uganda Mole-rat	RHIZOMYIDAE	Tachyoryctes	ankoliae	LC	LC	South West Uganda							
Mount Elgon Mole-rat	RHIZOMYIDAE	Tachyoryctes	ruddi	LC	LC	Mt Elgon National Park, South West Uganda							
Rueppell's Mole-rat	RHIZOMYIDAE	Tachyoryctes	splendens	LC	LC	South west Uganda, Busoga to eastern Uganda							
Thomas' Tree Squirrel	SCIURIDAE	Funisciurus	anerythrus	LC	LC	Bwindi Impenetrable National Park, Kibale National Park, Bugoma Forest Reserve, Mabira Forest Reserve							
Carruthers' Mountain Tree Squirrel	SCIURIDAE	Funisciurus	carruthersi	LC	LC	Rwenzori Mt National Park, Bwindi Impenetrable National Park, Kalinzu Forest Reserve							
Cuvier's Fire-footed Squirrel	SCIURIDAE	Funisciurus	pyrrhopus	LC	LC	Bwindi Impenetrable National Park, Kibale National Park, Bugoma Forest Reserve, Mabira Forest Reserve							
Gambian Sun Squirrel	SCIURIDAE	Heliosciurus	gambianus	LC	LC	Mt Elgon National Park, Acholi, Busoga, Karamoja, Teso Districts, West Nile sub-region							
Red-legged Sun Squirrel	SCIURIDAE	Heliosciurus	rufobrachium	LC	LC	Kibale National Park, Semliki National Park, Bunyoro, Masaka Districts							
Montane Sun Squirrel, Rwenzori Sun Squirrel	SCIURIDAE	Heliosciurus	ruwenzorii	LC	VU D2	Rwenzori Mt National Park, Bwindi Impenetrable National Park	DRC, Uganda, Rwanda, Burundi	Montane forest habitats 1600-3000m	Mining for coltane, conversion to agriculture and resource extraction	May be declining	Within Protected Area system		Known occurrence limited to only two localities in the country. Few specimens collected. Presume slow decline
Alexander's Bush Squirrel	SCIURIDAE	Paraxerus	alexandri	LC	LC	Semliki National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Mabira Forest Reserve, Entebbe Municipality							
Boehm's Bush Squirrel	SCIURIDAE	Paraxerus	boehmi	LC	LC	Rwenzori Mt National Park, Semliki National Park (Mpanga), Mabira Forest Reserve, Kalinzu Forest Reserve, Bugoma Forest Reserve, Budongo Forest Reserve							
Giant Forest Squirrel	SCIURIDAE	Protoxerus	stangeri	LC	LC	Kibale National Park, Mabira Forest Reserve, Budongo Forest Reserve, Malabigambo Forest Reserve, Nabugabo Area Forests		Forests					

**Proposed National Redlist for Uganda: Evaluated Mammal Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	SUMMARY RATIONALE
Geoffrey's Ground Squirrel	SCIURIDAE	Xerus	erythropus	LC	LC	Wide spread throughout Uganda		Savanna and cultivated areas at low to mid elevation					
Unstriped Ground Squirrel	SCIURIDAE	Xerus	rutilus	LC	LC	Northern Uganda		Savanna and cultivated areas at low to mid elevation					
Lesser Cane Rat	THRYONOMYIDAE	Thryonomys	gregorianus	LC	LC	Widely occurring		Marsh areas and cultivated areas at low to mid elevation					
Common Cane Rat	THRYONOMYIDAE	Thryonomys	swinderianus	LC	LC	Widely occurring		Savanna and cultivated areas at low to mid elevation					
Ant Bear/ Aardvark	ORYZOMYIDAE	Oryzomys	opimus	LC	LC								

Note: selected elements of the comprehensive listings available with USAID/Uganda. Assessors: Dr Robert Kityo [kityrob@gmail.com](mailto:kityrob@gmail.com); Sarah Prinsloo [sprinsloo@wcs.org](mailto:sprinsloo@wcs.org); Sam Ayebare [sayebare@wcs.org](mailto:sayebare@wcs.org); Dr Andrew Plumtre [aplumtre@wcs.org](mailto:aplumtre@wcs.org); Aggrey Rwetsiba [aggrey.rwetsiba@ugandawildlife.org](mailto:aggrey.rwetsiba@ugandawildlife.org); Waswa Sadic [waswasadic@gmail.com](mailto:waswasadic@gmail.com); Solomon Sebuliba [nsaxon99@gmail.com](mailto:nsaxon99@gmail.com); Herbert Tushabe [htushabe@gmail.com](mailto:htushabe@gmail.com). Reviewers: Dr Julian Peterhans Kerbis [jkerbis@fieldmuseum.org](mailto:jkerbis@fieldmuseum.org); David R. Mills [africanleopard@gmail.com](mailto:africanleopard@gmail.com); Badru Mugerwa [mugerwa@itfc.org](mailto:mugerwa@itfc.org); Fred Wanyama [fred.wanyama@ugandawildlife.org](mailto:fred.wanyama@ugandawildlife.org); Tom Butynski [TButynski@aol.com](mailto:TButynski@aol.com)

**Table 19: Proposed National Redlist for Uganda: Evaluated Reptile Species**

Proposed National Redlist for Uganda: Evaluated Reptile Species													
COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Helmeted Terrapin, Marsh terrapin	PELOMEDUSIDAE	Pelomedusa	subrufa	NE	LC	Murchison Falls National Park, Toro-Semliki Wildlife Reserve, Shores of L. Victoria	Central- southern Africa						Not listed for Uganda but appears to be reasonably widespread.
Adanson's Hinged Terrapin	PELOMEDUSIDAE	Pelusios	adansonii	NE	CR B1ab(ii,iii)	Shores of Lake Albert, adjoining streams and wetlands	Sudanian phytochorium belt, West African to Ethiopia	Lakeshores, streams and wetlands, not open water (hidden in vegetation)	Conversion of wetlands, grazing, fires	Inferred decline	None	Need to study and protect breeding sites urgently as well as education to local population	Spawls reports that no definite records from East Africa. However Behangana 2014 reports it from West Nile area, encountered only a few times. Appears to be found only outside protected areas and thus not well studied ie West Nile on Lake Albert shorelines- need further study to confirm range - however if only in West Nile is CR due to confined AOO/EOO
Zaire Hinged Terrapin	PELOMEDUSIDAE	Pelusios	chapini	NE	CR B1ab(ii,iii)	Murchison Falls National Park, Kabwoya Wildlife Reserve (along Lake Albert shoreline)	DRC, CAR, Gabon, Cameroon.	Wetlands adjacent to rivers and lakes	Conversion of wetlands, grazing, fires	Inferred decline due to habitat loss outside Protected Areas in AOO	None	Need to study and protect breeding sites urgently as well as education to local population	Type locality is Kasenyi, Lake Albert. Not previously known in Uganda, but found in recent studies - needs confirmation. If EOO only Lake Albert shoreline in Uganda would be much less than 100km <sup>2</sup> , therefore CR
Forest Hinged Terrapin	PELOMEDUSIDAE	Pelusios	gabonensis	NE	DD	Semuliki National Park (Spawls et al. 2006)	Guinea-Congolian species (sp is Congo Basin). Uganda as Eastern limit	swamps, streams and rivers in forest. Adults prefer larger rivers, juveniles quiet waters.	hard to catch, so unknown	Presume decline due to lack of recent records	in PA (Semliki NP)	Confirm presence	Cited as present in DRC but distribution map does not endorse this. Therefore presence in Uganda may be questioned. Record for Semliki forest streams from unknown source and date and needs confirmation. May be better listed as DD
Hewitt's Hinged Terrapin	PELOMEDUSIDAE	Pelusios	rhodesianus	LC	NT	Lake Victoria	Angola, Namibia, Botswana, Zimbabwe, Mozambique, CAR, Tanzania, Uganda,	weedy shallow dams and back waters	Presume habitat degradation and wetland clearance, possibly water quality	Presume decline due to lack of recent records	None	Undertake DNA analysis and confirm extent of EOO	Donald G. Broadley, Richard C. Boycott, 1992 list this species for Western Uganda generally, not seen recently so needs to be confirmed. This could be a cryptic species which needs DNA analysis of specimens called P. subrufa and P. niger williamsii
William's Hinged Terrapin, Williams African Mud Turtle	PELOMEDUSIDAE	Pelusios	williamsi	NE	LC	Semuliki National Park, Queen Elizabeth National Park, Karuma Wildlife Reserve, Toro-Semliki Wildlife Reserve, Kabwoya Wildlife Reserve, Kaiso Tonya Community Wildlife Conservation Area							
Leopard Tortoise	TESTUDINIDAE	Geochelone	pardalis	NE	NT	N.E Uganda. Not recorded in Central and Western Uganda.	East and Southern Africa except South Africa	Medium altitude savanna and grassland	Trade, hunting by humans, conversion of habitat to farmland	Decline		none	
Bell's Hinge-back Tortoise	TESTUDINIDAE	Kinixys	belliana	NE	NT	North East to West Uganda (Spawls et 2006); Murchison Falls National Park, Karuma Wildlife Reserve, Budongo Forest Reserve, Kabwoya Wildlife Reserve		Dry to moist Savanna and Coastal thicket, from sea level to near 2000m	Trade, hunting by humans, conversion of habitat to farmland	Decline	some populations in Pas		
Serrated Hinge-back Tortoise	TESTUDINIDAE	Kinixys	erosa	DD	DD	Budongo Forest Reserve, possibly Bugoma Forest Reserve	West and central Africa, eastern limit as Uganda	Unknown but apparent records from mid-altitude tropical high forest	Habitat degradation and loss	Presume decline due to lack of recent records	Range within PA, habitat poorly protected	Concerted effort to understand AOO of species if present	Record from Budongo from unknown source and needs confirmation. Uncommon tortoise was found in Bugoma, Feb 2015, potentially



Proposed National Redlist for Uganda: Evaluated Reptile Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
													this species but needs further analysis (no specimen, photographic records).
African Soft-shelled Turtle	TRIONYCHIDAE	Trionyx	triunguis	CR (mediterranean sub-population only assessed)	CR C2a(i,ii)+D	Shores of Lake Albert, Victoria Nile Below the falls	Widely distributed Arabian peninsula, mediterranean coastline and Africa	Fresh water, breeding in sandy banks	Albertine sub-population under severe threat as harvested for consumption, including egg hunting (belief in medicinal value of meat).	Declining to point of extinction	None	Need to study and protect breeding sites urgently as well as education to local population	Previously known from Lake Turkana in Kenya but now believed extinct. Actual sighting on rocks below the falls. Plastrons and live sightings from Buhuka flats shores of L. Albert.
Nile Crocodile	CROCODYLIDAE	Crocodylus	niloticus	LC	NT	Murchison Falls National Park, Kabwoya Wildlife Reserve, Queen Elizabeth National Park	Widespread in Africa	Rivers and pools in Central and Western Uganda	Hunting, population pressure, conflict with people	Decline	Range partially within PA system	Establish current abundance and rate of decline	Project collecting eggs should be monitored to ensure numbers are not impacted in Murchison Falls National Park. May be NT
West African crocodile	CROCODYLIDAE	Crocodylus	suchus	NE	CR B1ab(i,ii,iii,iv)	Along rivers in Kidepo Valley National Park, Easterly range limit	Mauritania, Benin, Nigeria, Niger, Cameroon, Chad, CAR, Equatorial Guine, Senegal, Mali, Guinea, Gambia, Bukin Faso, Ghana, Togo, Ivory Coast, DRC, Congo, Uganda	Rivers and water pools in semi arid countryside of Karamoja	Habitat destruction and hunting	Decline	Partly protected in PA	Bogezi C did a comprehensive survey of this species in Kidepo valley. Needs further study outside the PA and protection	Type locality: Niger. Last known Nile population is in the Kidepo valley.
Broad-snouted Crocodile	CROCODYLIDAE	Osteolemus	tetraspis	VU	DD	Kasyoha-Kitomi Forest Reserve, Toro-Semliki Wildlife Reserve, Lake George	Guinea-Congolian species (ssps in Congo Basin). Uganda as Eastern limit	Presumed habitat of pools, small lakes and shady areas on streams adjacent or within forests	Unknown	Unknown	None	Currently poorly understood	Recorded for the second time in Uganda in 1993 by Frontiers along R. Wasa and Wango in Toro-Semliki WR (Stubblefield, 1993), this species originally recorded in 1972 from a specimen of about 1.8m long in a pit near L. George (Guggisberg, A.W. 1972). The presence of this species needs further confirmation.
Common Tree Agama, Blue-throated Agama	AGAMIDAE	Acanthocercus	atricollis	LC	LC	Rwenzori Mountains National Park, Bwindi Impenetrable National Park, Murchison Falls National Park, Kibale National Park, Karuma Wildlife Reserve, Toro-Semliki Wildlife Reserve, Kyambura Wildlife Reserve	Eritrea south through East Africa to southern Africa						Open savanna, predominantly arboreal
Kenya Rock Agama	AGAMIDAE	Agama	lionotus	NE	LC	Murchison Falls National Park, Budongo Forest Reserve, Karuma Wildlife Reserve, Kabwoya Wildlife Reserve, Kabwoya Wildlife Reserve, Kaiso Tonya Community Wildlife Conservation Area	West and central, not to DRC						The Reptile Database states that Agama lionotus is now considered a distinct species (Kenya Rock Agama) found in Tanzania, Uganda, Kenya, Ethiopia and that A. agama is only found in West Africa - change this reference
Flapneck Chameleon	CHAMAELONIDAE	Chamaeleo	dilepis	LC	DD	Unknown	East and Southern Africa	Woody and bushy grasslands, adaptable	International trade	Unknown			No location information, The Reptile Database states occurs in Uganda.
Smooth chameleon	CHAMAELONIDAE	Chamaeleo	lavigatus	LC	LC	Widespread in Uganda -Western and Northern Uganda, East around Mt Elgon, Lake Victoria basin	Central and East Africa	moist savanna from 1000 - 1500m in East Africa - and possibly below. Found in low lying herbs, shrubs and hedges.	None known.	Stable	none	none	

Proposed National Redlist for Uganda: Evaluated Reptile Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Senegal Chameleon	CHAMAEL EONIDAE	Chamaeleo	senegalensis	LC	NA	Unknown	West-central but not as far East as DRC						C. senegalensis is West and Central African. The East African species is C. laevigatus. Delete from list
Sternfeld's Forest Chameleon, Ituri Chameleon	CHAMAEL EONIDAE	Kinyongia	adolffriederici	LC	EN B1ab(i,ii)	Kibale National Park, Bwindi Impenetrable National Park	Malawi, Mozambique, Republic of South Africa,	Forest and Woodland, between 1000 and 2000m	Trade for exotic pet markets	Unknown, presume decline	Within PAs but hunting not well controlled	Restrict trade	Recent assessment EOO = 879 sk km. DRC populations are not well-defined. Record for Bwindi confirmed Greenbaum et al 2014. Kibale record unconfirmed. Not commonly encountered in Uganda
High-casqued Forest Chameleon	CHAMAEL EONIDAE	Kinyongia	carpenteri	NT	EN B1ab(v)	Only known from Rwenzori Mountains National Park at 2000m	Zimbabwe, Kenya, Zambia	Afrotropical forests of DRC and Uganda in high canopy of large trees. Does not utilise converted agricultural landscapes	Habitat conversion, Trade for exotic pet markets	Decline	Partially within PA	Restrict trade	Type locality Mt Rwenzori above 2000m. Tolley K and Plumtree A Authors 2014 redlist entry
Disc-snouted Forest Chameleon, Strange-horned Chameleon	CHAMAEL EONIDAE	Kinyongia	xenorhina	NE	VU D2	Rwenzori Mountains only both sides of border	DRC, Uganda						Perviously known as Bradypodion xenorhinum. No information on abundance, threat and habitat, so need to review urgently to ensure adequately classified, otherwise list as DD
Spectral Pigmy Chameleon, Cameroon Stumptail Chameleon	CHAMAEL EONIDAE	Rhampholeon	spectrum	LC	DD		West and Central Africa	Evergreen and semi-evergreen wet forests (Akani et al. 2001). This species prefers to perch on small herbaceous plants and woody stems	Affected by habitat loss and fragmentation and international trade				IUCN does not list for Uganda and no location records found
Side-striped Chameleon	CHAMAEL EONIDAE	Trioceros	bitaeniatus	NE	NT	Karuma Wildlife Reserve, Kabwoya Wildlife Reserve	Ethiopia, Kenya, Sudan, Uganda, Tanzania, DRC						Apparently only recent records for this species - keep as NT until can determine true extent of EOO/AOO and potential status - however, appears locally common
Montane Side-striped Chameleon	CHAMAEL EONIDAE	Trioceros	elliotti	NE	LC	Rwenzori Mountains National Park, Kibale National Park, Bwindi Impenetrable National Park, Echuya Forest Reserve	Burundi, Kenya, South Sudan, Rwanda, Tanzania, Uganda, DRC						
Gracile Chameleon	CHAMAEL EONIDAE	Trioceros	gracilis	NE	LC	Murchison Falls National Park, Karuma Wildlife Reserve, Toro-Semliki Wildlife Reserve, Kabwoya Wildlife Reserve, Kiso Tonya Community Wildlife Reserve							
High-casqued Forest Chameleon, Helmeted Chameleon	CHAMAEL EONIDAE	Trioceros	hoehnelii	LC	NT	Mt Elgon National Park	Kenya, Uganda	High altitude, cool temperate zones utilising multiple vegetation types as perch sites, from grasses to shrubs, dense bushes and trees. May tolerate anthropogenic habitats, and sometimes abundant in agricultural landscapes. Also ericaceous heathland habitats					Locally common and adaptable, yet single site and no recent studies to know if there are any threats
Rwenzori	CHAMAEL EONIDAE	Trioceros	johnstoni	LC	LC	Rwenzori Mountains National Park,	Restricted to	Sub-montane to	Loss of forest	Unknown			Only two locations known in country, yet

**Proposed National Redlist for Uganda: Evaluated Reptile Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Three-horned Chameleon, Johnstone's Chameleon	EONIDAE	os				Bwindi Impenetrable National Park	Albertine Rift (DRC, Uganda, Rwanda, Burundi)	montane 1000-2500m	outside PA's, bush burning, international trade				no evidence of decline at present. Review
Smooth Chameleon	CHAMAEL EONIDAE	Trioceros	laevigatus	NE	EN B1 ab(iii)	Murchison Falls National Park, Bugungu Wildlife Reserve	Central and East Africa		Extensive burning throughout savanna of EOO, conversion outside PA and degradation	Inferred decline	Within PA but burning not well controlled	Initiate fire management	IUCN lists as Chamaeleo laevigatus.
Ruwenzori Side-striped Chameleon, Rwenzori Bearded Chameleon	CHAMAEL EONIDAE	Trioceros	rudis	LC	NT	Ruwenzori Mountains National Park, Bwindi Impenetrable National Park	Albertine Rift Endemic - Burundi, DRC, Rwanda, Uganda	Low bushes and shrubs in relatively open habitats, in a transitional zones between bamboo forest and montane heath, as well as grassland and reedbeds and near severely degraded forest edge in exotic trees	International trade and clearance for agriculture	Possible decline	Range within reasonably protected PA's		Now considered a complex of species, with possibly only Rwenzori Mt population belonging to the species T. rudis. May be locally abundant
Ituri Forest Chameleon	CHAMAEL EONIDAE	Trioceros	ituriensis	LC	EN B1 ab(iv)	Semuliki National Park, Kibale National Park	Widespread in DRC	presumably occurs in montane, sub-montane and lowland forest but nothing is known of its ability to tolerate habitat modification		Unknown, presume decline	none	Further study recommended particularly within Kibale and Semliki forests	EOO for Kibale and Semliki = 873 sq km. The Ugandan population is easterly margin of the range. It needs to be studied
White-lipped Herald Snake	COLUBRIDAE	Crotaphopeltis	hotamboei	NE	LC	Murchison Falls National Park, Rwenzori Mountains National Park, Queen Elizabeth National Park, Budongo Forest Reserve, Bugungu Wildlife Reserve, Toro-Semliki Wildlife Reserve	Sub-Saharan Africa, but not yet Angola, DRC, Sudan	African savanna living species - wetlands not necessarily connected with open waterbodies	Burning, intensive grazing	Presume stable	Partially PA protected		Type locality Africa. Known distribution in Uganda from Albertine Rift. Recent records available. Not commonly met as nocturnal feeding on frogs
Cape Snake-lizard	CORDYLIDAE	Chamaesaura	anguina	NE	NT	South West Uganda, Ssese Islands and Lake Victoria shoreline (Spawls et al 2006), Kibale National Park, Sango Bay Grasslands	Republic of South Africa, Swaziland, Angola, Kenya, Tanzania, S Mozambique, E/S Democratic Republic of the Congo (Zaire), Uganda	High grassland of E. African plateaux from about 1200-3000m		Unknown	some populations in Pas		
Dickerson's Forest Gecko	GEKKONIDAE	Cnemaspis	dickersoni	NE	VU D2	Kibale National Park, presumed Semliki National Park	East Africa, including Ethiopia and Sudan and west to DRC	Presumed low-mid altitude forest	Habitat degradation and loss	Unknown	Range within PA, habitat reasonably protected	Confirm extent of EOO	Type locality Medje and Ituri, DRC. If confirmed only to occur in Kibale, this species would be upgraded to EN due to EOO, but potential presence in Semliki should be assessed as this would be its likely range.
Mt Elgon Forest Gecko	GEKKONIDAE	Cnemaspis	elgonensis	NE	DD	Rwenzori Mt National Park, Sipi Falls (Elgon)	+/-50%. Endemic highlands of Uganda and Kenya	Unknown but altitude above 2000m	Unknown, presume habitat degradation	Stable	Range within PA, only partially well protected (Rwenzori)	Confirm presence in both locations	Found only in Kenya and Uganda, named after type locality. Record Kenya Lotters et al 2007. Records Uganda unknown dates
Brook's House	GEKKONIDAE	Hemidactylus	brookii	NE	LC	Murchison Falls National Park, Kibale National Park, Queen Elizabeth National							

**Proposed National Redlist for Uganda: Evaluated Reptile Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Gecko						Park, Karuma Wildlife Reserve, Toro-Semliki Wildlife Reserve, Kyambura Wildlife Reserve, Kabwoya Wildlife Reserve, Kaiso Tonya Community Wildlife Conservation Area							
Tropical House Gecko	GEKKONIDAE	Hemidactylus	mabouia	NE	LC	Murchison Falls National Park, Kibale National Park, Kabwoya Wildlife Reserve							
Baobab Gecko	GEKKONIDAE	Hemidactylus	platycephalus	NE	DD	Kyambura Wildlife Reserve	Eastern coastline of Africa from Ethiopia down to Mozambique	Coastal and islands	Unknown	Unknown	Range within PA, habitat reasonably protected	Confirm extent of EOO	Needs confirmation of Kyambura specimen - habitat sounds correct but far from known range
	GEKKONIDAE	Hemidactylus	richardsonii	NE	DD	Unknown	Cameroon, DRC, Gabon, CAR		Unknown	Stable	Unknown	Confirm presence and EOO	No record listed for Uganda. May need to remove from list
Chevron-throated Dwarf Gecko	GEKKONIDAE	Lygodactylus	gutturialis	NE	LC	Murchison Falls National Park, Semuliki National Park, Kyambura Wildlife Reserve, Kabwoya Wildlife Reserve							
Fischer's Thick-toed Gecko	GEKKONIDAE	Pachydactylus	laevigatus	NE	DD	Unknown	South Africa, Angola, Namibia			Unknown		Confirm presence	No record listed for Uganda. Southern Africa species, may need to delete from list
Yellow-throated Plated Lizard	GERRHOSAUROIDAE	Gerrhosaurus	flavigularis	NE	VU B1 ab(iii)	Karamoja Region	Eastern Africa (Sudan to Namibia) not Uganda or DRC	rocky outcrops for basking and retreats into cracks in rock. woodland, high grassland, moist and dry savanna	Hunted for food, burning	Presume decline	None	Protection to Mt. Moroto areas and fire management regime	Record from Nakiloro, (foot of Mt Moroto) Karamoja - Databank Survey 1996. Record would strictly allow a category of EN, but suspect more widespread within suitable habitat.
Tawny Plated-lizard	GERRHOSAUROIDAE	Gerrhosaurus	major	NE	LC	Murchison Falls National Park, Kabwoya Wildlife Reserve, Kaiso Tonya Community Wildlife Conservation Area							
Black-lined Plated-lizard	GERRHOSAUROIDAE	Gerrhosaurus	nigrolineatus	NE	NT	Single Uganda record south west of Kampala; Confirm Karamoja (Kidepo National Park) records	Gabon, W/S Democratic Republic of the Congo (Zaire), Angola, Namibia, Tanzania, Botswana,	Moist and Dry Savanna, Coastal bush and grassland - from sea level to about 1600m	unknown	Unknown			Need further surveys/investigations
Multi-scaled Forest Lizard	LACERTIDAE	Adolfus	africanus	NE	LC	Kibale National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve							
Alpine-meadow Lizard	LACERTIDAE	Adolfus	alleni	NT	VU B1 ab(iii)	Mt Elgon National Park	Kenya (Kyelangani Hills, Mt Kenya, Abedare Mts), Uganda	Forest and shrublands (meadows) above 2700m	Habitat conversion, agriculture, grazing	Inferred decline	Range partially within PA	Confirm EOO	VU according to Reptile Database. Notes say present in other Uganda Mts (Greenbaum et al 2011), but do not specify (could be Eastern mts?). Listing therefore presumes EOO larger than Mt Elgon and may need revising otherwise AOO less than 500km <sup>2</sup> (Elgon forest area = 400km <sup>2</sup> )
Jackson's Forest Lizard	LACERTIDAE	Adolfus	jacksoni	NE	LC	Rwenzori Mountains National Park, Bwindi Impenetrable National Park, Echuya Forest Reserve							
Sparse-scaled Forest Lizard	LACERTIDAE	Congolacerta	vauereselli	LC	LC	Ruwenzori Mountains National Park, Kibale National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve	Western Uganda, Western Tanzania, Burundi, Rwanda, central and Eastern DRC	Medium-High altitude forest species	Unknown, presume habitat degradation	Presume stable	Part of range within reasonably protected Pas		Type locality, Kagera west of L. Victoria (Tanzania). LC according to Reptile Database
Speke's Sand-lizard	LACERTIDAE	Heliobolus	spekii	NE	CR B1 ab(iii)	Amudat District (Karamoja Region)	Southern Kenya, Tanzania, Somalia,	Steppe and sandy banks/cliffs	Habitat conversion,	Inferred decline due to habitat loss	None - known range outside Pas in	need to study exact EOO	Type locality Taita Hills. National biodiversity databank records this species

**Proposed National Redlist for Uganda: Evaluated Reptile Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
							South Sudan and South Ethiopia.		agriculture, grazing		Uganda		during its studies of 1996 (Behangana) - previously unrecorded for Uganda. Classification based on known EOO and AOO (sandy dry riverbeds) in Uganda.
Serrate-toed Tree-lizard/ Saw-tailed lizard	LACERTIDAE	Holaspis	guentheri	NE	VU B2ab(iii)	Kibale National Park, Budongo Forest Reserve	West -central Africa, Eastern limit Western Uganda and Tanzania	Forest species	Habitat degradation and loss	Presumed decline due to lack of recent records	Range falls within Pas	Confirm if still present	No recent records for Uganda. Records for Kibale and Budongo unknown source. May need to upgrade if threats/habitat understood
Boulenger's Scrub-lizard/ Uganda Savanna Lizard	LACERTIDAE	Nucras	boulengeri	NE	EN B2ab(iii)	Busoga Sub-Region	Uganda, Kenya, Tanzania and Zambia	Savanna scrub, woodland and wooded grassland	Habitat conversion - most of presumed EOO under intensive agriculture	Inferred decline, although appears to be adaptable to fallow or disturbed land	None - known range outside PAs in Uganda	Further study to determine EOO	Type locality Busoga, Lubwa Village. Recent photographic evidence from Soroti but EOO still unknown but could be a very constricted area, as historical and recent records within 100km area and could therefore be CR. Photo evidence by W. Lukwago 2015
Anchieta's Serpentine Skink	SCINCIDAE	Eumecia	anchietae	NE	DD	Unknown	Angola, southern DRC, Kenya, Tanzania, Zambia	Unknown	Unknown	Unknown		Study anticipated AOO to establish presence	Type locality Huilela Plateau, Angola. Presumed likely presence in Uganda, but no records found in literature
Uganda Five-toed Skink	SCINCIDAE	Leptosia	aloyisiabaudiea	LC	NT	Ajai and Katongo Wildlife Reserves, Kabarole District, Wobulenzi (Luweero District), Mityana District and savanna near Kampala	Central Africa from Nigeria to Uganda and southern Sudan (Sudanian phytocorium belt?)	Riverine woodland and swamp	Habitat conversion - most of presumed EOO under intensive agriculture	Inferred decline	None - most of known population outside Protected Areas	More surveys in areas where previously encountered to confirm current distribution needed	Distribution maps also show for Lake Albert, Type locality Mityana.
Rwanda Five-toed Skink	SCINCIDAE	Leptosia	graueri	NE	LC	Rwenzori Mountains National Park, Bwindi Impenetrable National Park	Albertine Rift endemic - Uganda, Rwanda, Burundi, DRC						
Kivu Four-toed Skink	SCINCIDAE	Leptosia	hackarsi	NE	VU D2	Bwindi Impenetrable National Park	Uganda, DRC	Swamps within forest	Deforestation, degradation	Presume stable	Within reasonably protected PA	Study status - need to understand potential threats	Type locality Kamatembe, DRC. Number of records from Bwindi confirm presence
Rwenzori Four-toed Skink	SCINCIDAE	Leptosia	meleagris	VU	VU D2	Mubuku Valley in Rwenzori Mountains National Park	Uganda DRC	High altitude wet forest 2100-2700m	Habitat loss and degradation	Despite being in PA little is known about this species and it could easily be lost with degradation in the forest where it occurs due to continued biofuel and other resource extraction	Within reasonably protected PA	Establish threats and status	Single site in Uganda
Fireskink, Red And Black Writhing Skink	SCINCIDAE	Lygosoma	fernandi	NE	LC	Murchison Falls National Park, Kibale National Park, Bwindi Impenetrable National Park	West Africa						Reptile database does not list for Uganda, but seem to have reliable records.
Sundevall's Writhing Skink	SCINCIDAE	Lygosoma	sundevalli	LC	NT	Murchison Falls National Park, Toro-Semliki Wildlife Reserve	East and Southern Africa	Dry or moist savanna, semi-desert, medium to high altitude woodland. It is commonly found under rocks in loose soil and sand and under logs	Expected to be affected by intensive fire throughout range	Inferred decline	Within PAs but burning not well controlled	Establish status and abundance. Initiate fire management	
Peters' Writhing-skink	SCINCIDAE	Mochlus	afer	NE	DD	Southwest Mt Elgon National Park, Mt Kadam (Nakapiripirit District), Lake Victoria shores (Jinja), Lake Albert	Somalia, Kenya, Tanzania, Uganda, Ethiopia, Zambia,	Open savanna rangelands	Burning, intensive grazing	Presume stable	Part of range within PAs, but not protected against	Control burning and grazing regimes	Type locality in Mozambique Islands. Uncommonly found in Uganda. Taxonomy may be confused. Populations of



Proposed National Redlist for Uganda: Evaluated Reptile Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
						shores (Butiaba, Kaiso Tonya, Kabwoya, MFNP)	Mozambique, DRC, CAR				the key threats		Murchison Falls NP, Bugungu and Kabwoya could also be this species. Listing DD until this is confirmed.
Short-necked Skink	SCINCIDAE	Trachylepis	brevicollis	NE	VU B1ab(iii)	Eastern Uganda North west, west and south of Mt Elgon	Eastern Africa, north to Saudi, Oman and Yemen	Low altitude moist and dry savanna woodland, semi desert and coastal thicket	High rate of habitat conversion to agriculture and rice paddies	Presume decline	None	Further study could show AOO more restricted	No recent records - very rarely encountered. With further study could be more endangered - need to define EOO/AOO
Alpine-meadow Skink	SCINCIDAE	Trachylepis	irregularis	NT	EN B2ab(iii)	Mt Elgon National Park	Kenya, Uganda	Alpine meadows	Burning	Presume decline due to lack of recent records	Range within PA, habitat poorly protected from threats	Needs further study to confirm presence in Ugandan side of Mt Elgon	Uncommon even in prime habitat. Found in Abedares, Mt Kenya, Mt Elgon.
Speckle-lipped Skink	SCINCIDAE	Trachylepis	maculilabris	NE	LC	Murchison Falls National Park, Kibale National Park, Semuliki Wildlife Reserve, Kyambura Wildlife Reserve, Kabwoya Wildlife Reserve, Kaiso Tonya Community Wildlife Conservation Area							
Grass-top Skink, Long-tailed Skink	SCINCIDAE	Trachylepis	megalura	NE	NT	Murchison Falls National Park, Kibale National Park, Bwindi Impenetrable National Park, Sango Bay Forest Reserve, North Uganda (Pelembek)	Ethiopia, Uganda, Kenya, Tanzania, Mozambique, Somalia, Rwanda, Burundi, E/S Democratic Republic of the Congo (Zaire), Angola, Sudan (L. Chirio, pers. comm.), Zambia,	High altitude grassland and open grassy savanna (Rangelands)	Fire, conversion of traditional rangelands	Presume decline	None	Fire management, maintenance of rangelands	Traditionally used by cattlekeepers in the past to clean lice ( Western Uganda). Rarely encountered and need to study current AOO which may be more restricted.
Taita Mabuya	SCINCIDAE	Trachylepis	perrotetii	NE	DD	Unknown	West Africa, Sahelian north to Mauritania and Mali west to Sudan and Uganda	Unknown	Unknown	Unknown		Needs serious study to confirm its location/presence in Uganda	No records for Uganda known, but distribution maps for Reptile Database show presence in Uganda. No habitat preference stated. May need to delete from list
Rainbow Skink, Five-lined Mabuya	SCINCIDAE	Trachylepis	quinquetaeniata	NE	VU B2ab(iii)	Karuma Wildlife Reserve, Kabwoya Wildlife Reserve	West, Central and parts of North Africa	Habitat degradation, burning	Expected to be affected by intensive fire throughout range	Inferred decline	Within PAs but burning, grazing and degradation not well controlled	Understand abundance and AOO	Restricted range in Uganda in areas not well-controlled and threats not understood. AOO 807km <sup>2</sup> . Need to address status of this species.
Common Striped Skink	SCINCIDAE	Trachylepis	striata	NE	LC	Bwindi Impenetrable National Park, Rwenzori Mountains National Park, Kibale National Park, Murchison Falls National Park, Budongo Forest Reserve, Toro-Semliki Wildlife Reserve, Kyambura Wildlife Reserve,							
Variable Skink	SCINCIDAE	Trachylepis	varia	NE	DD	Uncertain	Eastern Africa, from Gulf of Aden to Mozambique and below DRC to west Africa and south but not South Africa	Unknown	Unknown	Unknown			Hard to distinguish this species from T. machulibris and T. quinquetaeniata. Presence in Uganda not certain and needs confirmation. From available specimens need to undertake DNA analysis.
Southeastern Savanna Monitor	VARANIDAE	Varanus	albigularis	NE	VU B1+2ab(iii)	Karamoja Region (Nakapiripit, Iriri, Amudat, Moroto, N.E Kidepo Valley National Park; Spawls et al 2006)	Eastern and southern Africa	Savanna woodland, not associated with water	Fire, habitat destruction	Presume decline	none	Fire management and further study	Known from old records - no recent records reported. EOO of North-Eastern Uganda sub-region taken as less than 20,000km <sup>2</sup> - need to check
Western Savanna	VARANIDAE	Varanus	exanthematicus	LC	LC	Murchison Falls National Park, Semuliki National Park, Toro-Semliki Wildlife							



Proposed National Redlist for Uganda: Evaluated Reptile Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Monitor						Reserve, Kabwoya Wildlife Reserve, Kaiso Tonya Community Wildlife Conservation Area							
Nile Monitor	VARANIDAE	Varanus	niloticus	NE	LC	Murchison Falls National Park, Budongo Forest Reserve, Karuma Wildlife Reserve, Toro-Semliki Wildlife Reserve, Kabwoya Wildlife Reserve							
Gray's Monitor Lizard	VARANIDAE	Varanus	ornatus	VU	EN B1 ab(iii)	Murchison Falls National Park	Guinea-Congolian species. Uganda as Eastern limit	nests in holes, e.g. dry trees	Cutting, burning	Inferred decline	Within PA but burning not well controlled	Confirm AOO/EOO	This species only recently distinguished from juveniles of <i>V. niloticus</i> in MFNP in Uganda. EOO needs further work. Sporadic distribution throughout range in Africa.
Western Purple-glossed Snake	ATRACTASPIDIDAE	Amblydipsas	unicolor	NE	DD	West Nile sub-region, Kampala, Jinja and Masindi	West to East Africa, north to Niger and Chad	Dry and moist savanna, woodland, primary and relic forest, burrowing, rarely collected. 100 - 1500m	Habitat degradation and loss	Infer potential drastic decline due to habitat loss	None - known range outside PA's	Confirm presence in reported locations and establish AOO/EOO	Presence in Uganda reported (Pitman) but locations and recent records unknown. Not observed recently in localities mentioned possibly due to fossorial habits but otherwise presume decline
Jackson's Centipede-eater	ATRACTASPIDIDAE	Aparallactus	jacksonii	NE	DD	Likely occur in Northern Acholi sub-region and Karamoja Region (Pitman)	Ethiopia, northern Tanzania, South Sudan, Kenya, Somalia, Uganda; Tyle locality - Ghana	coastal bush, moist and dry savanna and high grassland, from sea level to 2200m	Habitat conversion, agriculture, grazing	Presume decline	None		Type locality, foot of Mt Kilimanjaro. No known recent records
Reticulated Centipede-eater; Plumbeous Centipede Eater	ATRACTASPIDIDAE	Aparallactus	lunulatus	NE	VU D2	Semuliki National Park, possibly Northern and Eastern Regions (Pitman)	Sub-Saharan Africa	Fossorial	Uncommonly found and hard to spot, disturbed by clearance, agriculture, burning	Presume stable	Known AOO within reasonably protected PA	Establish if more wide distribution	Not known in Kenya and South Sudan. Not well known throughout range. Specific and recent records for Western Uganda. Drews and Pitman presume wider Ugandan distribution, not confirmed. Otherwise listed for known current AOO
Western Forest Centipede-eater	ATRACTASPIDIDAE	Aparallactus	modestus	NE	NT	Mabira Forest Reserve, Budongo Forest Reserve, Bundibugyo District, Kabarole District, Greater Kampala and Kariita Sub-County	West to central Africa, eastern extent Uganda	Unknown, possibly forest species from distribution	Habitat degradation and loss	Rapid decline in available habitat outside PA's so infer decline	Range includes PA's with variable levels of protection	Confirm records for Kaiso, Kabwoya	Type locality West Africa. Due to apparent preference for forest, records for Kaiso and Kabwoya are possibly a misidentification of <i>A. lunulatus</i>
Western Forest Stiletto-snake, mole viper, slender burrowing asp	ATRACTASPIDIDAE	Atractaspis	aterrima	NE	EN B2ab(iii)	Wadelai on the White Nile, Northern Uganda (Pitman)	West to Senegal and Gambia, also in Tanzania Udzungwa and Uluguru Mtns	Arid or semi-arid; Dry savanna, moist savanna, woodland and forest from sealevel to 2000m	Habitat disturbance and cultivation	Inferred decline as cultivation increasing rapidly within range outside PA's	None	Establish EOO/AOO and ensure protection of sufficient habitat	Described by Pitman, Hard to spot. Type locality West Africa. Usually nocturnal and encountered when digging. Needs assessment as EOO presumed very broadly, but confirmation of only one site so listed on this basis.
Variable Stiletto Snake	ATRACTASPIDIDAE	Atractaspis	irregularis	LC	DD	Murchison Falls National Park, Semuliki National Park, Kibale National Park, Queen Elizabeth National Park, Budongo Forest Reserve, North western shore of Lake Victoria, Lake Kyoga, (West Madi to Wadelai- Pitman)	most of sub-Saharan Africa	Mosit savanna woodland and forest between 600-1800m	Unknown	Unknown	none	needs more study to determine current distribution	Spawls et al (2006) describes distribution for Uganda as widespread (see locations) but otherwise not well known and no recent records. If found in all locations confirm as least concern
Small-scaled Stiletto Snake	ATRACTASPIDIDAE	Atractaspis	microlepidota	LC	DD	Northern Uganda	West Africa	Unknown	Unknown	Unknown			Reptile database only reports this species for West Africa. No records for Uganda. Provisionally admitted on Ugandan checklist (Pitman, 1974)
Boettger's Two-headed Snake	ATRACTASPIDIDAE	Micrelaps	boettgeri	NE	DD	Northern Acholi sub-region, Northern Karamoja Region (Pitman), and Amudat District (Spawls)	Eastern Africa - Sudan, Ethiopia, Somalia, Kenya, Uganda	Semi desert, dry and moist savanna, from 200 -1700m	Unknown	Unknown			Type locality Dolo. Little known about this species

Proposed National Redlist for Uganda: Evaluated Reptile Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Eastern Snake-eater	ATRACTA SPIDIDAE	Polemon	christyi	NE	DD	Rwenzori Mt National Park, Lake Victoria shoreline and forests, Lake George shoreline, Lake Nabugabo, Budongo forest (Spawls et al 2006), Kabarole District	Eastern DRC, Uganda, Rwanda, Tanzania, Zambia and Malawi	Forest, thick woodland, well wooded savanna and recently deforested areas between 600-1700m. Primary forest localities or relics like	Habitat disturbance and cultivation	Inferred decline as cultivation increasing rapidly within range outside PA's	Range includes PA's with variable levels of protection	Need to survey in known location to understand EOO/AOO/habitat and potential threats	Type locality Uganda and Rwanda. Pitman shows records for Uganda in restricted area. Burrowing species hard to see. Ruwenzori Mountains NP, Kibale NP, Queen Elizabeth NP could be misidentifications. LCor NT if surveys show the widespread distribution mentioned by Pitman 1974
Pale-collared Snake-eater	ATRACTA SPIDIDAE	Polemon	collaris	NE	VU B2ab(iii)	Bundibugyo (possibly within Semuliki National Park) and Kibale National Park (Spawls, 2006)	Angola north to Cameroon and east to Uganda	Forest and forest remnants, altitude below 1200m	Habitat degradation and loss	Inferred decline as Bundibugyo outside PA with habitat conversion	Range partially within PA's with reasonable protection	Need to survey in known location to understand EOO/AOO/habitat and potential threats	AOO is 873 sqkm. Previous known record in East Africa in Kibale NP and now Semliki NP. If surveys confirm current distribution, then species would be VU (B2(iii)) as species has registered a loss from remaining habitat outside PA's
African Snake-eater, Yellow-necked Snake Eater	ATRACTA SPIDIDAE	Polemon	fulvicollis	NE	VU D2	Semuliki National Park	Cameroon, Gabon, Congo, DRC, Uganda	Forest, 630m	Unknown	Unknown		Need to survey in known location to understand EOO/AOO/habitat and potential threats	EOO/AOO is 221 sqkm. Previous known record in East Africa in the now Semuliki NP. If surveys confirm current distribution and species is declining could easily go to EN
Gaboon Snake-eater	ATRACTA SPIDIDAE	Polemon	gabonensis	NE	VU D2	Semuliki National Park	DRC, Cameroon, Nigeria, CAR, Congo Brazzaville	forest, 630m	Unknown	Increasing		Need to survey in known location to understand EOO/AOO/habitat and potential threats	EOO/AOO is 221 sqkm. Previous known record in East Africa in the now Semuliki NP. If surveys confirm current distribution and species is declining could easily go to EN
Southern African Python	BOIDAE	Python	natalensis	NE	DD	Unknown	Central, East and Southern Africa to Mozambique						The Reptile Database does not list for Uganda and no location records known
African Python	BOIDAE	Python	sebae	NE	LC	Murchison Falls National Park, Kibale National Park, Karuma Wildlife Reserve, Budongo Forest Reserve, Toro-Semliki Wildlife Reserve, Kabwoya Wildlife Reserve, Kaiso Tonya Community Wildlife Conservation Area							
Royal Python	BOIDAE	Python	regius	LC	VU B1ab(iii)	West Nile Sub-Region	Namibia, Botswana, Republic of South Africa, Swaziland, Zimbabwe, Mozambique, Zambia, Angola, Tanzania, S Ethiopia, S Somalia, Kenya, Uganda, S Democratic Republic of the Congo (Zaire)	Dray grassland to open forest, including agricultural land	Heavy and rapid conversion to agriculture	Presume decline	None	Further study to understand remaining EOO/AOO	Known from old records - no recent records reported. EOO of West Nile sub-region taken as less than 20,000km <sup>2</sup> - need to check
Red And Black Striped Snake	COLUBRIDAE	Bothrophthalmus	lineatus	NE	LC	Semuliki National Park, Rwenzori Mountains National Park, Mabira Forest Reserve, Lake Victoria forests, Budongo Forest Reserve, Bugoma Forest Reserve, Itwara Forest Reserve, Kibale National Park, Kalinzu-Maramagambo Forest Reserve, Mafuga Forest Reserve, West Nile (Pitman 1974)	West -central Africa	Forest and forest islands from 700-2300m. Terrestrial, nocturnal snake, living in forest, often near water, hides in holes, leaf litter, under or in rotting logs.	forest destruction and conversion.	Inferred decline due to habitat degradation	Range includes PA's with variable levels of protection		The species has been reported in recent times in Marabigambo (a pair was mating - Behangana 1998) and Bugoma (WCS research team 2015). It appears widespread within forest reserves.
	COLUBRIDAE	Chamaelycus	fasciatus	NE	DD	Semuliki National Park (Spawls et al, 2002)	West -central Africa	Forest, presumably nocturnal and terrestrial or burrowing	Unknown	Presume decline due to lack of recent records	Range within PA, habitat reasonably protected	Establish current AOO	Old literature points to Semliki Forest as the only locality where recorded, and only one record. More surveys need to

Proposed National Redlist for Uganda: Evaluated Reptile Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
													be done to confirm presence of this species. If only in Semliki NP= 221 sq km, EOO and AOO qualify it to EN (B1, B2 a,biii)
Parker's Banded Snake	COLUBRIDA	Chamaelycus	parkeri	NE	DD	Unknown	DRC, Congo, Angola, Uganda			Unknown			May delete from Ugandan list because it is nowhere in literature of any recordings. Reptile database does not confirm Ugandan distribution
Degen's Cat-snake	COLUBRIDA	Crotaphopeltis	degeni	NE	LC	Murchison Falls National Park, shores of Lake Albert, Lake Victoria and Lake Nabugabu	South Sudan, Uganda, Kenya, Ethiopia, CAR, Cameroon with relic population in Tanzania	Wetlands associated with large water bodies, semi-aquatic species	Conversion of wetlands	Presume stable	No particular protection except statutory, RAMSAR		Type locality Entebbe
Montane Forest Egg-eater	COLUBRIDA	Dasypeltis	atra	NE	LC	Murchison Falls National Park, Semuliki National Park, Rwenzori Mountains National Park, Kibale National Park, Queen Elizabeth National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Itwara Forest Reserve, Kasyoha-Kitomi Forest Reserve, Kalinzu-Maramagambo Forest Reserve, Bwindi Impenetrable National Park, Mafuga Forest Reserve, Toro-Semliki Wildlife Reserve,							
Western Forest Egg-eater	COLUBRIDA	Dasypeltis	fasciata	LC	VU D2	Semuliki National Park, Toro-Semliki Wildlife Reserve	Throughout Western and Central Africa	Lowland rainforests - forest dependant	Geothermal, oil and mineral exploration, habitat degradation	Unknown but likely to decline	Within PA		Restricted range in two contiguous protected areas, only part of Toro-Semliki has forest (EOO/AOO approx 500km <sup>2</sup> ). If declining should be ranked as EN
Common Egg-eater	COLUBRIDA	Dasypeltis	scabra	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Budongo Forest Reserve, Kasyoha-Kitomi Forest Reserve, Kalinzu-Maramagambo Forest Reserve, Kyambura Wildlife Reserve, Toro-Semliki Wildlife Reserve							
Gunther's Green Tree-snake	COLUBRIDA	Dipsosaurus	unicolor	NE	LC	Semuliki National Park, Kibale National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Mafuga Forest Reserve, Mabira Forest Reserve	West -central Africa	Medium to high altitude forest 2200m		Unknown	conserved in Pas/Forest Reserves		Fairly widespread in mostly in forests of Western Uganda. Mabira record indicates the the species could be more spread out. Recent records in Bwindi where 5 specimens were recorded in one swamp shows that it can be fairly common. Hence LC status
	COLUBRIDA	Dipsosaurus	viridis	NE	DD	Semuliki National Park	Liberia through Cameroon through the Democratic Republic of the Congo (Zaire; except in the south), Gabon (PAUWELS et al. 2002), Central African Republic, Togo, Ivory Coast, Ghana, Niger	Medium altitude forest up to 1400m but more below 1000m. Arboreal and nocturnal		Unknown	Range presumed within PA, habitat reasonably protected		Distribution map shown location on Uganda DRC Border. Needs further investigation/surveys.
Black-tailed Tree Snake	COLUBRIDA	Dipsosaurus	weileri	NE	DD	Semuliki National Park, Mabira Forest Reserve	Togo, SW Cameroon, Central African Republic, S Sudan, Equatorial Guinea,	Medium altitude forest, alborial		Unknown	Range within PA, habitat reasonably protected		No recent records. Need further investigation.

**Proposed National Redlist for Uganda: Evaluated Reptile Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
							Gabon, Democratic Republic of the Congo (Zaire; except in the SOUTH)						
Boomslang	COLUBRIDA	Dispholidus	typus	NE	LC	Queen Elizabeth National Park, Mabira Forest Reserve, Budongo Forest Reserve, Itwara Forest Reserve, Central Uganda forests near Kampala	kivuensis: Zambia (Abercorn), Rwanda, Kenya (Eldoret, Subukia), Uganda. Type locality: "Uvira, Lake Tanganyika, Kivu District, Ruanda-Urundi"	Thickets, woodland, forest edges, moist and dry savanna and semi desert up to 4500 feet.	habitat destruction	Stable	Range partially within PA's with reasonable protection		to about 4500ft, known from Kampala, SW Ankole, Budongo forest and Teso - elsewhere in Uganda D. typus typus there seems to be a nominate race typus and kivuensis without dark mottling shields.
Common Slug-eater	COLUBRIDA	Duberria	lutrix	LC	DD	Kibale National Park, Bwindi Impenetrable National Park, Echuya Forest Reserve	East and Southern Africa			Unknown			
Keel-scaled Green-snake	COLUBRIDA	Gastrophys	smaragdina	NE	LC	Semuliki National Park, Kibale National Park, Queen Elizabeth National Park, Kasyoha-Kitomi Forest Reserve, Kalinzu-Maramagambo Forest Reserve, Kyambura Wildlife Reserve							
Western Forest Snake	COLUBRIDA	Geodipsas	depressiceps	NE	DD	Possibly Kibale National Park, Kalinzu Forest Reserve	Uganda, Cameroon			Unknown			6 Records for these forests from Global Biodiversity Information facility web resource
	COLUBRIDA	Gonionotophis	brussauxi	NE	DD	Budongo Forest Reserve	Cameroon, DRC, Congo, Gabon			Unknown		Study presence in Budongo and status	Reptile databse does not list for Uganda, but ther appears to be a record for this single location
Cape File-snake	COLUBRIDA	Gonionotophis	capensis	LC	VU D2	Budongo Forest Reserve	Eastern, Central and Southern Africa	Savanna. Hides in holes in the ground, cavities in walls, hollow logs or deserted termite mounds, emerging at night to hunt. Frequently enters human habitation	Unknown	Possibly Stable	Possibly not threatened as yet in savanna areas of Budongo	Confirm any threats to species and whether might occur elsewhere (e.g. Bugungu WVR)	Rearely encountered and secretive so hard to be sure of status. Slow moving. Only one locations so VU as limited habitat in 1 location and uncertain of status.
Western Forest File-snake	COLUBRIDA	Gonionotophis	poensis	NE	DD	Bwindi Impenetrable National Park, Mafuga Forest Reserve, Budongo Forest Reserve	West and Central Africa			Unknown			
Small-eyed File-snake	COLUBRIDA	Gonionotophis	stenophthalmus	NE	DD	Semuliki National Park, Kibale National Park	West and Central Africa			Stable			
Smyth's African Water-snake	COLUBRIDA	Grayia	smythii	NE	DD	Murchison Falls National Park, Queen Elizabeth National Park	West, Central and Eastern Africa			Unknown			
Tholloni's Water-snake	COLUBRIDA	Grayia	tholloni	NE	DD	Murchison Falls National Park, Queen Elizabeth National Park, Kasyoha-Kitomi Forest Reserve, Kalinzu-Maramagambo Forest Reserve, Echuya Forest Reserve	Central to East Africa, including Sahelian countries	Almost entirely aquatic		Unknown			
Black-lined Green-snake	COLUBRIDA	Hapsidophrys	lineatus	NE	DD	Kibale National Park, Budongo Forest Reserve	West-central and East Africa						
Kenya Bark-snake	COLUBRIDA	Hemirhagerrhis	hildebrandtii	LC	DD	Unknown	East Africa north to Sudan			Stable			
Uganda House Snake, Yellow	COLUBRIDA	Hormonotus	modestus	NE	DD	Budongo Forest Reserve	West and Central Africa			Stable			

Proposed National Redlist for Uganda: Evaluated Reptile Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Forest-snake													
Common House-snake	COLUBRIDA	Lamprophis	fuliginosus	NE	DD	Rwenzori Mountains National Park, Toro-Semliki Wildlife Reserve	Widespread Africa						Restricted range in Uganda but two sites not contiguous and different habitat so may be adaptable and widespread, or some of records suspect?
Lined House-snake	COLUBRIDA	Lamprophis	lineatus	NE	DD		West Africa, including Sahel (Mali, Niger, Chad) and Central (DRC, Uganda, Gabon)			Unknown			No location information, The Reptile Database states occurs in Uganda.
Gaboon Water-snake	COLUBRIDA	Lamprophis	olivaceus	NE	LC	Bwindi Impenetrable National Park, Semuliki National Park, Kibale National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Itwara Forest Reserve, Kalinzu-Maramagambo Forest Reserve							
Cape Wolf-snake	COLUBRIDA	Lycophidion	capense	LC	LC	Murchison Falls National Park, Semuliki National Park, Rwenzori Mountains National Park, Queen Elizabeth National Park, Budongo Forest Reserve, Mafuga Forest Reserve, Bugungu Wildlife Reserve							
Flat-snouted Wolf-snake	COLUBRIDA	Lycophidion	depressirostre	NE	DD		East Africa, north to Sudan and west to CAR			Unknown			No location information, The Reptile Database states occurs in Uganda.
Flat Wolf Snake	COLUBRIDA	Lycophidion	laterale	NE	DD	Semuliki National Park	West and Central Africa to Angola			Unknown			The Reptile database does not list for Uganda, but records from Semliki
Ornate Wolf-snake	COLUBRIDA	Lycophidion	ornatum	LC	NT	Rwenzori Mountains National Park, Kibale National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Mafuga Forest Reserve	Central and East Africa	Forest and deforested areas, hiding in leaf litter, holes or rotting logs during the day. Feeds on small forest lizards. 700-2700m	Unknown	Unknown	Within reasonably protected PA's		Confirmed records for Bwindi and Kibale (Spawns et al 2002, Vanesh 2001), but not sighted often enough to be certain of LC. Not very adaptable despite occurring in recent deforested areas due to specialised diet requirements.
Dark-bellied Crowned Snake	COLUBRIDA	Meizodon	regularis	NE	DD	Unknown	Scattered from West Africa to Kenya			Unknown			The Reptile Database does not list for Uganda. Unclear why listed
Olive Marsh Snake	COLUBRIDA	Natriciteres	olivacea	LC	DD	Murchison Falls National Park, Kibale National Park, Queen Elizabeth National Park	Western, Eastern and Southern Africa	Wetlands, pans and other marshy, damp areas; also found in grasslands, savanna and forest. Seeks refuge under stones, logs and crevices in clay banks of streams, not far from water. Diet: Frogs and small fish	Alteration, conversion and degradation of wetlands	Unknown		Need a better understanding of its AOO within the areas listed to understand distribution and potential status	
Battersby's Green-snake	COLUBRIDA	Philothamnus	battersbyi	NE	DD	Unknown	Sudan, South Sudan, Ethiopia, Somalia, Kenya, Uganda, possibly TZ, Cameroon			Stable			No location information, The Reptile Database states occurs in Uganda.
Bequaert's Green-snake	COLUBRIDA	Philothamnus	bequaerti	NE	DD	Semuliki National Park	Cameroon, CAR, DRC, South Sudan, Ethiopia, Uganda			Unknown			
Thirteen-scaled	COLUBRIDA	Philothamnus	carinatus	NE	DD	Kibale National Park, Budongo Forest Reserve, Mafuga Forest Reserve	Scattered from West to Central Africa	Rainforest		Unknown		Need better understanding of	



Proposed National Redlist for Uganda: Evaluated Reptile Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Green-snake													habitat requirements to understand distribution and status
Slender Green-snake	COLUBRIDA	Philothamnus	heterolepidotus	NE	LC	Kibale National Park, Bwindi Impenetrable National Park, Queen Elizabeth National Park							
Southeastern Green-snake	COLUBRIDA	Philothamnus	hoplogaster	NE	LC	Murchison Falls National Park, Semuliki National Park, Rwenzori Mountains National Park, Queen Elizabeth National Park, Mafuga Forest Reserve							
Hughes' Green-snake	COLUBRIDA	Philothamnus	hughesi	NE	DD	Unknown	DRC, Congo, Cameroon, CAR			Unknown			The Reptile Database does not list for Uganda and no location records known
Brilliant Green-snake, Green Bush Snake	COLUBRIDA	Philothamnus	nitidus	NE	DD	Murchison Falls National Park, Kibale National Park	West, Central to East Africa			Unknown			
Ruanda Forest Green-snake	COLUBRIDA	Philothamnus	ruandae	NE	LC	Rwenzori Mountains National Park, Kibale National Park, Mafuga Forest Reserve							
Variiegated Bush-snake	COLUBRIDA	Philothamnus	semivariiegatus	NE	LC	Murchison Falls National Park, Semuliki National Park, Kibale National Park, Budongo Forest Reserve, Toro-Semliki Wildlife Reserve, Bugungu Wildlife Reserve							
Flower's Racer; Flowered Snake; Geoffroy's Racer	COLUBRIDA	Platycephalus	florulentus	LC	EN ab(iii)	Only known on Uganda's northern border near Nimule- East bank of River Nile (Pitman)	Libya, Egypt (North Sinai [HR 32: 59]), Sudan, Ethiopia, Eritrea, Somalia, Kenya, Uganda, Cameroon	Terrstrial - bushes and low trees. Fast moving and diurnal/crepuscular	Habitat conversion, agriculture, grazing	Inferred decline due to habitat loss	None		Potential wider distribution in Northern Uganda needs further investigation.
East African Shovel-snout	COLUBRIDA	Prosymna	ambigua	LC	LC								
Speckled Shovel-snout, Ghana Shovel-snout	COLUBRIDA	Prosymna	meleagris	LC	DD	Unknown	Dry Sudanian belt of Western Africa	Savanna and forest-savanna mosaics in areas where annual rainfall exceeds 1,500 mm					IUCN does not list this species for Central or East Africa. Unclear why listed
Lined Olympic-snake, Striped Swamp Snake	COLUBRIDA	Psammophis	lineatus	NE	LC	swamps around Lake Nabugabo, Lake Victoria (Busu near Jinja), Lake Kyoga (Serere District), Victoria Nile, (Masindi), Albert Nile (Lira, Gulu, Rhino camp)	West, Central to East Africa	Marshes, lake shores and marshes, moist savanna esp on flood plains		Stable	none	none	Widespread and habitats numerous; therefore LC
Hissing Sand-snake	COLUBRIDA	Psammophis	sibilans		LC	Murchison Falls National Park, Semuliki National Park, Queen Elizabeth National Park, Budongo Forest Reserve, Bugungu Wildlife Reserve, Toro-Semliki Wildlife Reserve, Kyambura Wildlife Reserve,							
Olive Grass-	COLUBRIDA	Psammophis	phillipsii	NE	DD	Kibale National Park	West and Central	Forest, forest margin to		Unknown			The Reptile Database does not list for



**Proposed National Redlist for Uganda: Evaluated Reptile Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
snake	DAE	phis					Africa	1200m					Uganda, need to verify record
Speckled Sand-snake	COLUBRIDEAE	Psammophis	punctulatus	NE	DD	Unknown	East Africa, Sudan, throughout horn of Africa			Unknown			No location information, The Reptile Database states occurs in Uganda.
Rukwa Sand-snake	COLUBRIDEAE	Psammophis	rukwae	NE	DD	Unknown	Northwest and West Africa, also Tanzania			Unknown			The Reptile Database does not list for Uganda and no location records known
Western Link-marked Sand-snake	COLUBRIDEAE	Psammophis	tanganicus	NE	DD	Unknown	Libya, Sudan, Horn of Africa, East Africa			Unknown			No location information, The Reptile Database states occurs in Uganda.
Striped Beaked-snake	COLUBRIDEAE	Psammophylax	acutus	NE	DD	Murchison Falls National Park	West and central Africa, east to Tanzania			Unknown			Not enough known about habitat and AOO to classify. Apparently single PA, needs verification.
Western Rufous-beaked Snake	COLUBRIDEAE	Rhamphophis	oxyrhynchus	NE	DD	Unknown	Widely distributed sub-Saharan Africa, absent in some countries, but north to Mali			Unknown			No location information, The Reptile Database states occurs in Uganda.
Eastern Rufous-beaked Snake	COLUBRIDEAE	Rhamphophis	rostratus	NE	DD	Unknown	East and Southern Africa			Stable			No location information, The Reptile Database states occurs in Uganda.
Red-spotted Beaked-snake	COLUBRIDEAE	Rhamphophis	rubropunctatus	LC	DD	Unknown	Ethiopia, South Sudan, Somalia, Kenya, Tanzania	Semi- and near-desert, both moist and dry savanna, woodland. Possible association with termite mounds as shelter sites, but is equally able to utilize tree holes and other natural hollows. Diurnal, mostly terrestrial, but will climb into low trees		Unknown			IUCN does not list this species for Uganda
Large-eyed Green Tree Snake	COLUBRIDEAE	Rhamnophis	aethiopissa	NE	DD	Kibale National Park, Budongo Forest Reserve	West, Central and East Africa			Unknown			
Grey Beaked-snake	COLUBRIDEAE	Scaphiophis	albopunctatus	NE	DD	Unknown	West, Central and East Africa			Unknown			No location information, The Reptile Database states occurs in Uganda.
Ethiopian Beaked-snake	COLUBRIDEAE	Scaphiophis	raffreyi	NE	DD	North East Uganda	Sudan, Eritrea, Ethiopia, Uganda, possibly Kenya						No location information, The Reptile Database states occurs in north-east Uganda.
Arabian Cat Snake	COLUBRIDEAE	Telescopus	dhara	NE	DD	Unknown	North and East Africa, south to Kenya, Uganda						No location information, The Reptile Database states occurs in Uganda.
Forest Vine-snake, Bird Snake	COLUBRIDEAE	Thelornis	kirtlandii	NE	LC	Murchison Falls National Park, Semuliki National Park, Kibale National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Kalinzu-Maramagambo Forest Reserve, Mafuga Forest Reserve, Kabwoya Wildlife Reserve							
Black Tree-snake	COLUBRIDEAE	Thrasops	jacksonii	NE	LC	Queen Elizabeth National Park, Semuliki National Park, Rwenzori Mountains National Park, Kibale National Park, Budongo Forest Reserve, Kasyoha-							

**Proposed National Redlist for Uganda: Evaluated Reptile Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
						Kitomi Forest Reserve, Toro-Semliki Wildlife Reserve							
Blanding's Tree-snake	COLUBRIDA	Toxicodryas	blandingii	NE	VU B2ab(ii,iii,iv)	Sporadically recorded in Lake Victoria forests, Budongo Forest Reserve (Spawls et al, 2006)	West -central Africa	Forest, woodland and forest-savanna mosaic and riverine woodland at altitude 700-2200m.	Habitat degradation and loss	Inferred decline	Range within PA, habitat poorly protected	Need surveys to determine current distribution of the species	Few records and clearly rare. Lake Victoria habitats facing severe degradation and conversion.
Powdered Tree-snake	COLUBRIDA	Toxicodryas	pulverulenta	NE	NT	Shores of Lake Victoria, Mabira Forest Reserve, Budongo Forest Reserve, Itwara Forest Reserve, Kibale National Park, Semuliki National Park	West -central Africa	Forest and woodland, medium to high altitude	Habitat degradation and loss	Presumed decline form lack of recent records	Range within PA's, habitat poorly protected from threats	Establish current AOO	This species is reported in literature as widespread. If so, then list as Least Concern. But it has not been documented in Uganda for a long time. It needs to be researched and could easily attain a higher category.
Jameson's Mamba	ELAPIDAE	Dendroaspis	jamesoni	NE	LC	Semuliki National Park, Rwenzori Mountains National Park, Kibale National Park, Budongo Forest Reserve, Itwara Forest Reserve, Kasyoha-Kitomi Forest Reserve, Karuma Wildlife Reserve, Toro-Semliki Wildlife Reserve							
Black Mamba	ELAPIDAE	Dendroaspis	polylepis	LC	NT	Murchison Falls National Park, Kabwoya Wildlife Reserve, Kaiso Tonya Community Wildlife Conservation Area	Common sub-Saharan Africa	Well-wooded savanna or riverine forest, especially in areas with an abundance of rocky hills and big trees. Commonly found on ground	Fire management, conflict with people	Possibly stable	Within PAs but burning not well controlled		Only found in 3 PA's bordering Lake Albert, 2 of which are not well-protected, yet only feasible threat might be burning.
Sudanese Garter-snake	ELAPIDAE	Elapsoidaea	laticincta	NE	DD	Unknown	Ethiopia, S Sudan, Uganda, DRC, Chad, CAR, Cameroon						No location information, The Reptile Database states occurs in Uganda.
Loveridge's Garter-snake	ELAPIDAE	Elapsoidaea	loveridgei	NE	DD	Rwenzori Mountains National Park	DRC, Kenya, Sudan, Burundi, Tanzania, Rwanda, Ethiopia, Somalia, Uganda						Potentially single site but habitat requirements not known to understand EOO/AOO or threats and status.
Egyptian Cobra	ELAPIDAE	Naja	haje	NE	DD	Murchison Falls National Park, Budongo Forest Reserve, Bugungu Wildlife Reserve, Toro-Semliki Wildlife Reserve	Widespread North Africa including Sahel, East Africa and Zimbabwe						Appears widely distributed in savanna habitats of Western Uganda, although its habitat requirements, potential threats and current status are not known.
Forest Cobra	ELAPIDAE	Naja	melanoleuca	NE	LC	Murchison Falls National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Mafuga Forest Reserve, Budongo Forest Reserve, Bugoma Forest Reserve, Itwara Forest Reserve, Bugungu Wildlife Reserve, Karuma Wildlife Reserve, Toro-Semliki Wildlife Reserve, Kyambura Wildlife Reserve, Kabwoya Wildlife Conservation Area							
Black-necked Splitting Cobra	ELAPIDAE	Naja	nigricollis	NE	LC	Murchison Falls National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Semuliki National Park, Rwenzori Mountains National Park, Kasyoha-Kitomi Forest Reserve, Bugungu Wildlife Reserve, Karuma Wildlife Reserve, Toro-Semliki Wildlife Reserve, Kabwoya Wildlife Reserve	Widely distributed in most of Africa, except extreme north and south						Appears widely distributed in a wide range of habitats in Western Uganda

Proposed National Redlist for Uganda: Evaluated Reptile Species

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Goldie's Tree Cobra	ELAPIDAE	Pseudohaje	goldii	NE	DD	Semuliki National Park, Rwenzori Mountains National Park, Queen Elizabeth National Park, Kibale National Park, Kasyoha-Kitomi Forest Reserve	Central Africa extending to Kenya	Apparent wide range of habitat types, likely woodland-forest					Relatively small EOO in Western Uganda, south of Lake Albert to QENP. Mostly appears to frequent savanna and woodland habitats. No information if this species may in fact be LC
Cairo Worm-snake, Cairo Blind-snake	LEPTOTYPHLOPIDAE	Myriopholis	cairi	NE	DD	Unknown	North Africa, including Kenya, Uganda, sporadically in West	Moist cultivated areas in otherwise arid regions					No location information, The Reptile Database states occurs in Uganda.
Jan's Black Worm-snake, Cape Thread Snake	LEPTOTYPHLOPIDAE	Leptotyphlops	conjunctus	NE	DD	Unknown	South Africa, Swaziland, Lesotho						The Reptile Database does not list for Uganda and no location records known
Emin Pasha's Worm-snake	LEPTOTYPHLOPIDAE	Leptotyphlops	emini	NE	DD	Semuliki National Park, Rwenzori Mountains National Park, Kyambogo Wildlife Reserve	Sudan, Tanzania, Uganda, Kenya, DRC, Zambia	Savanna					Records for Uganda confirmed but not clear how widespread this species might be and whether there are threats.
Somali Giant Blind-snake, Schlegeli Giant Blind-snake	TYPHLOPIDAE	Afrotyplops	brevis	NE	DD	Unknown	Sudan, Ethiopia, Somalia, Kenya, Uganda,						No location information, The Reptile Database states occurs in Uganda.
Beaked Snake	TYPHLOPIDAE	Letheobia	sp.		DD	Rwenzori Mountains National Park		Forest? Fossorial		Unknown	none	Further surveys in the Rwenzoris	A genus of blind snake in the family Typhlopidae found in Africa. One record by E. Greenbaum, D. Hughes and M. Behangana encountered under a log between Rivers Kyoha and Mahoma along tourist route in Rwenzoris. Need to confirm which species this is.
Angolan Blind-snake	TYPHLOPIDAE	Typhlops	angolensis	NE	LC	Semuliki National Park, Kibale National Park, Bwindi Impenetrable National Park, Mafuga Forest Reserve							
Lineolate Blind-snake	TYPHLOPIDAE	Typhlops	lineolatus	NE	LC	Widpread	altitudes not exceeding 6500ft						
Pallid Blind-snake	TYPHLOPIDAE	Typhlops	pallidus	NE	DD	Unknown	Unknown						Suggest this may be the Zanzibar Beaked Snake, <i>Letheobia pallida</i> COPE, 1868, said to occur in coastal mosaic, but EOO includes Uganda (South Sudan, Ethiopia, Kenya, Uganda, Tanzania)
Spotted Blind-snake	TYPHLOPIDAE	Typhlops	punctatus	NE	LC	Murchison Falls National Park, Semuliki National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kabwoya Wildlife Reserve, Kaiso Tonya Community Wildlife Conservation Area							
Hispid Bush-viper, African Hairy Bush-viper	VIPERIDAE	Atheris	hispidus	NE	DD	Rwenzori Mountains National Park, Bwindi Impenetrable National Park	DRC, Uganda, Kenya, Tanzania	Trees (arboreal)					
Great Lakes Bush-viper	VIPERIDAE	Atheris	nitschei	NE	LC	Rwenzori Mountains National Park, Kibale National Park, Bwindi Impenetrable National Park, Mafuga Forest Reserve							
Hallowell's	VIPERIDAE	Atheris	squamiger	NE	LC	Semuliki National Park, Rwenzori							

**Proposed National Redlist for Uganda: Evaluated Reptile Species**

COMMON NAME	FAMILY	GENUS	SPECIES	IUCN GLOBAL THREAT	PROPOSED NATIONAL THREAT	SITES	% GLOBAL POPULATION IN UGANDA	HABITAT PREFERENCE	KEY THREATS	Population trend in Uganda	CURRENT CONSERVATION MEASURES	RECOMMENDED CONSERVATION MEASURES	NOTES/RATIONALE FOR LISTING
Bush-viper			a			Mountains National Park, Kibale National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Itwara Forest Reserve, Karuma Wildlife Reserve							
Puffadder	VIPERIDAE	Bitis	arietans	NE	LC	Murchison Falls National Park, Rwenzori Mountains National Park, Queen Elizabeth National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Bugungu Wildlife Reserve, Toro-Semliki Wildlife Reserve							
Gaboon Viper	VIPERIDAE	Bitis	gabonica	NE	LC	Murchison Falls National Park, Semuliki National Park, Kibale National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Itwara Forest Reserve, Mafuga Forest Reserve, Toro-Semliki Wildlife Reserve, Karuma Wildlife Reserve							
Nose-horned Viper	VIPERIDAE	Bitis	nasicornis	NE	LC	Karuma WR, Budongo FR, Bugoma FR, Semuliki WR, Semuliki NP, Kibale NP, Kalinzu-Maramagambo FR, Queen Elizabeth NP, Bwindi Impenetrable NP, Mafuga FR							
Forest Night-adder	VIPERIDAE	Causus	lichtensteini	NE	LC	Semuliki National Park, Kibale National Park, Budongo Forest Reserve	West and Central Africa						
Western Night-adder, Spotted Night-adder	VIPERIDAE	Causus	maculatus	NE	DD	Toro-Semliki Wildlife Reserve	West and Central Africa						
Green Night-adder	VIPERIDAE	Causus	resimus	NE	DD	Queen Elizabeth National Park, Semuliki National Park, Budongo Forest Reserve	Central, East and Southern Africa to Mozambique						
Rhombic Night-adder	VIPERIDAE	Causus	rhombatus	NE	LC	Murchison Falls National Park, Semuliki National Park, Queen Elizabeth National Park, Budongo Forest Reserve, Itwara Forest Reserve, Toro-Semliki Wildlife Reserve							
Saw-scaled Viper	VIPERIDAE	Echis	carinatus	NE	NA	Unknown	Middle East, Asia						No apparent reason for this to be in Uganda reptile list as no records cited for Africa and should be removed

Note: selected elements of the comprehensive listings available with USAID/Uganda. Assessors: Dr Mathias Behangana [mbehangana@gmail.com](mailto:mbehangana@gmail.com); Sarah Prinsloo [sprinsloo@wcs.org](mailto:sprinsloo@wcs.org); Dr. Andrew Plumtre [aplumtre@wcs.org](mailto:aplumtre@wcs.org); Herbert Tushabe. [htushabe@gmail.com](mailto:htushabe@gmail.com); Sam Ayebare [sayebare@wcs.org](mailto:sayebare@wcs.org); Robert Sekisambu [rsekisambu@gmail.com](mailto:rsekisambu@gmail.com); Alezuyo Conslate [aconslate@gmail.com](mailto:aconslate@gmail.com).

Reviewers: Michele Menegon [mmenegon@gmail.com](mailto:mmenegon@gmail.com); Elena Garollo [elena.garollo@gmail.com](mailto:elena.garollo@gmail.com)

**Table 20: Proposed National Redlist for Uganda: Evaluated Bird Species**

Proposed National Redlist for Uganda: Evaluated Bird Species													
Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
Common Ostrich	STRUTHIONIDAE	Struthio	camelus	LC	EN C I	Karamoja sub-region	Two populations - Sahel to East Africa and Southern Africa. <10% Uganda	Semi-arid savanna	habitat conversion, illegal trade, hunting	Decline	Protected by law and CITES listed	Better enforcement of protection and prosecution	2014 total count recorded 213 KVNP (mostly within Kidepo valley), Karenga Community Wildlife Area - occasionally recorded elsewhere in Karamoja
Great Crested Grebe	PODICIPEDIDAE	Podiceps	cristatus	LC	CR D	Crater Lakes, Kabarole District	Scattered colonies north Africa, Ethiopia, DRC-Uganda-Kenya and southern Africa. <1% Uganda	Crater Lakes	Habitat degradation, conversion and fishing	Decline	None	Protect suitable lakes	Distinct East African sub-species would have a higher percentage of global population
Black-necked Grebe	PODICIPEDIDAE	Podiceps	nigricollis	LC	RE	No known sites	Breeding sedentary populations South Africa and Eastern Rift Valley, migratory North Africa, Mediterranean Europe and Asia	Freshwater marshes and lakes with lush vegetation (during breeding) and salt lakes (outside of breeding season)	Habitat conversion and degradation	Decline			ONLY TWO HISTORICAL RECORDS, NO SIGHTINGS SINCE 1970
African Darter	ANHINGIDAE	Anhinga	rufa	LC	VU C I	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, Lake Victoria, Lake Albert, Lake Bunyonyi, Kagera River, West Nile region	Sub-Saharan Africa	Water bodies, quiet bays with fringing trees, particularly dead trees in water	Capture in fishnets accidentally, habitat loss & degradation	Declining numbers observed	Protected areas (water bodies)	Enforcement of recommended fishing methods & gears, catchment protection	Very large range in Africa, but with specific habitat requirements. Can be found in reasonable numbers in suitable habitat. Observed to be in decline in Uganda. Believed to be decreasing through most of global range
White-backed Night-heron	ARDEIDAE	Gorsachius	leuconotus	LC	EN C2a(i)	Queen Elizabeth National Park, Lake Mburo National Park, Semliki Wildlife Reserve, River Nile, Lake Victoria	Sub-Saharan Africa	Nocturnal. Inhabits densely vegetated forest, especially wooded streams and wetland fringes or islands.	Habitat conversion and degradation	Decline	Partial - range includes but not limited to PA's	Ensure protection of suitable habitat in remaining AOO and monitor	Previously more common now only seen in Lake Mburo. Reported decline in South Africa, elsewhere unknown, presumed stable
Madagascar Pond-heron, Madagascar Squacco Heron	ARDEIDAE	Ardeola	idaea	EN	EN D	Queen Elizabeth National Park, Lake Mburo National Park, Lake Victoria, Lake Albert, Lake Kyoga	East Africa, DRC, Zambia, Zimbabwe, breeding only in Madagascar	Wetlands	Exploitation of eggs and young, continued degradation of wetlands	Unknown - only six records	Unknown	Establish status	Only six records to EARC for Uganda, recorded in Lutembe bay in 1994. increasing exploitation at breeding sites likely to be biggest threat in addition to habitat loss or degradation. Potential downgrade if population thought able to be rescued but status unclear and degradation throughout range
Rufous-bellied Heron	ARDEIDAE	Ardeola	rufiventris	LC	VU C2a(i)	Lake Mburo National Park, Lake Victoria, Lake Opeta IBA	Southern Africa from DRC, Kenya south, but excluding most of South Africa and Botswana	Shallow open water	Drainage	Presumed decline	Partial - range includes but not limited to PA's	Establish protection of key wetlands	Recent records Lukaya Flats, Lake Mburo, nr Masaka - uncommon but widely distributed in south. Presumed less than 1000. Old records of breeding
Green-backed Heron, Striated Heron	ARDEIDAE	Butorides	striata	LC	NT	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, West Nile region, Lake Victoria, Lake Albert, Lake Kyoga	Sub-Saharan Africa, Asia and South and Central America	Forested water-margins, ricefields, wetlands	Forest and wetland loss or degradation. Human pressure	Suspected decline	Partial - range includes but not limited to PA's		Very wide range stable in areas but declining elsewhere. Believed to be declining in Uganda
Black Heron, Black Egret	ARDEIDAE	Egretta	ardesiaca	LC	VU C2b	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, Lake Victoria, Lake Albert, Lake Kyoga	Sub-Saharan except Guineo-Congolian Region	Marshland	Human disturbance, especially at nesting sites, wetland drainage and degradation	Unknown	Partial - range includes but not limited to PA's	Establish status	Widespread in low numbers, extreme fluctuations noted. Globally believed stable in absence of evidence of decline
Great White Egret	ARDEIDAE	Casmerodius	alba	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Lake Victoria, Lake Albert, Lake Opeta IBA Lake Bisina IBA, West Nile Region, South-		rice paddies, shorelines of lake and rivers	habitat disturbance e.g over grazing				Widespread but in small numbers



Proposed National Redlist for Uganda: Evaluated Bird Species

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
						west highlands							
Purple Heron	ARDEIDAE	Ardea	purpurea	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburu National Park, Lake Victoria, Lake Albert, Lake Bunyonyi, Lake Mutanda, West Nile Region							
Grey Heron	ARDEIDAE	Ardea	cinerea	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburu National Park, Lake Albert, Lake Victoria, West Nile Region							Few breeding records. Palearctic and resident populations
Goliath Heron	ARDEIDAE	Ardea	goliath	LC	VU D1	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburu National Park, Lake Victoria, Lake Albert, West Nile region	Sub Saharan Africa - Uganda small perc	shoreslines of lakes and rivers	habitat disturbance	Presumed stable	Partial - range includes but not limited to PA's	Establish protection of key wetlands	Widespread but in small numbers
Black Stork	CICONIIDAE	Ciconia	nigra	LC	EN C2a(i)	Albertine Rift Valley	Sahel, East Africa north to Egypt, southern Africa and southern Asia	Swamps	Habitat conversion	Decline	Partial - range includes but not limited to PA's	Enforce protection of wetlands	Palearctic visitor, widespread but uncommon. Less than 250 seen in any year. Habitat and population decline throughout range
African Woollyneck, Woolly-necked Stork	CICONIIDAE	Ciconia	microscelis	VU	VU C2a(i)	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburu National Park, Lake Victoria, Lake Albert, Lake Kyoga, West Nile region	Sub-Saharan Africa except South-Western Africa	Natural Wetland habitats, moist grassland	Habitat degradation	Presumed decline	Partial - range includes but not limited to PA's	Establish protection of key wetlands	Widespread but normally in low numbers. Previously grouped together with Asian Woollyneck as C episcopus
Saddle-billed Stork	CICONIIDAE	Ephippiorhynchus	senegalensis	LC	VU C2a(i)	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburu National Park, Lake Victoria, Lake Albert, West Nile	Subsaharan Africa, <5% pop in Uganda	Wetlands, lakes, rivers and occasional in dry area, altitude <1500 m	Over grazing, draining of wetlands, destruction of nests esp. in farmlands	Declining	Partial - range includes but not limited to PA's	Strengthen wetland protection	
Shoebill	BALAENICIPITIDAE	Balaeniceps	rex	VU	EN D	Lake Victoria, Lake Albert, Lake Kyoga, River Nile, Queen Elizabeth National Park, Lake Mburu National Park, Murchison Falls National Park	Widely but locally distributed from South Sudan to Zambia. <10% Uganda	Papyrus swamps	Habitat degradation, illegal trade, hunted by fishermen	Decline	Species action plan - majority outside protected areas	Improve protection against hunting	Estimated Ugandan population 100-150 in 2007 (but possibly up to 200) out of total estimate of 3300 to 5300 mature individuals (2002)
Olive ibis, African Green Ibis	THRESKORNIITHIDAE	Bostrychia	olivacea	LC	En D	Semliki Valley (Bwamba Lowlands)	Scattered distribution in Equatorial belt from Guinea to Kenya, Tanzania, absent from much of range.	Dense primary lowland forest with little undergrowth and tall roosting trees	Forest degradation, fragmentation and loss.	Suspected decline			Last observed in Semuliki National Park in 2005. Believed to be decreasing globally although threats are unknown. Could potentially be downlisted as on edge of range and if believed able to be rescued from DRC. On record according to the East African Rarity committee (EARC)
Spot-breasted Ibis	THRESKORNIITHIDAE	Bostrychia	rara	LC	VU D1	Semliki National Park (Ntandi hotspings area)	Guineo-Congolian Region from Guinea	Forested streams or wooded swamps in good primary low-altitude forest	Forest degradation especially effects on river flow and quality	Suspected decline	Occurs within National Park	Establishwater quality controls within catchment	Records from Semliki National Park in the vicinity of the Ntandi Hotsprings in 2006. Globally believed stable, though forest destruction an increasing threat. Downlisted as on edge of range and potentially able to be rescued from DRC
Lesser Flamingo	PHOENICOPTERIDAE	Phoeniconaias	minor	NT	VU B2ac(iii,iv)	Queen Elizabeth National Park (Katwe Salt Lakes)	SubSaharan Africa and India. <1% Uganda	Salt lakes	Climate change could affect salt contents of lakes. Salt extraction on lakes	Fluctuating widely	Occurs within National Park	Protection of crater lakes within QENP from exploitation and degradation.	Also recorded as vagrant from KVNP, MFNP, Bufumbira County, Lake Victoria. Confined to crater lakes in QENP region. Few breeding records but breeding attempts made in recent past. Whilst non-breeding populations are found throughout Sub-Saharan Africa, breeding sites largely Kenya, Tanzania, Ethiopia, specifically Lake Natron where significant threats exist. Fairly rapid declines throughout range, yet downlisted as local populations likely to be rescued from elsewhere in East Africa should conditions warrant.
White-backed	ANATIDAE	Thalassornis	leuconotus	LC	VU C2a(i)	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburu	Sub-Saharan except Guineo-Congolian	Freshwater lakes and deltas with emergent	habitat loss, habitat degradation	Declining	Partial - range includes but not	Establish protection of key wetlands	Recent records indicates that it is declining (Uganda Bird Atlas)



Proposed National Redlist for Uganda: Evaluated Bird Species

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
Duck						National Park, Lake Victoria, Lake Kyoga, Lake Opeta IBA, Lake Bisina IBA	Region	and floating vegetation, esp lilies			limited to PA's		
Hartlaub's Duck	ANATIDAE	Pteronetta	hartlaubii	LC	DD	Semliki National Park	West and Central African species, Uganda as Eastern limit	Swamps, wetlands within forest (along oxbow bends/lakes on Semliki)	Unknown	Unknown	Occurs within National Park	Establish status	Under 10 records. Declining throughout global range, particularly West Africa where now believed to be scarce
African Black Duck	ANATIDAE	Anas	sparsa	LC	EN D	Rwenzori Mountains National Park, Bwindi Impenetrable National Park	Across central and southern Africa - very small population in Uganda	River specialist on fast flowing wooded and highland rivers and lakes - above 1500m	Small population and both forest loss and river degradation	Becoming harder to find indicating decline	Occurs within National Parks	Survey needed to establish population size	Old records from Mt Elgon, Bugoma Forest, L. Opeta. Only recent records from Rwenzori and Bwindi - only one or two pairs per lake. Probably very few mature adults in Uganda as a result. Not migratory and resident (sedentary) where it occurs. Overall global population decreasing
African Cuckoo Hawk	ACCIPITRIDAE	Aviceda	cuculoides	LC	LC	Mt Elgon National Park (western slopes), Queen Elizabeth National Park, Bwindi Impenetrable National Park, Kidepo Valley National Park, Opit Forest Reserve, Lake Victoria, Semliki Valley	Sub-Saharan Africa	Well-wooded areas/Forest edge up to 2500m	habitat decline	Stable			Widespread but in low numbers
Bat Hawk	ACCIPITRIDAE	Macheiramphus	alcinus	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, Lake Victoria, Lake Bunyonyi	Widespread Afro-tropical Africa	Forest, bush, urban areas					
Lammerger	ACCIPITRIDAE	Gypaetus	barbatus	NT	CR C I	Kidepo Valley National Park	Mainly Ethiopia, scattered and uncommon Kenya, Tanzania. 1-2% Uganda. Small numbers, Morocco, Egypt, South Africa	Mountains	Poisoning, habitat degradation and breeding disturbance	Decline	Protected by law, occurs in National Park	Better enforcement of protection and prosecution	Two sightings in KVNP within last 10 years
Egyptian Vulture	ACCIPITRIDAE	Neophron	percnopterus	EN	CR C I	Queen Elizabeth National Park, Lake Mburo National Park, Pian Upe Wildlife Reserve, Kidepo Valley National Park, Karamoja sub-region (Mt Elgon)	North Africa, south to Sahel belt and Eastern Africa with 1-2% Uganda	Semi arid	Poisoning, reduced food availability, habitat degradation	Decline	Protected by law	Better enforcement of protection and prosecution	Declining throughout global range which affects Ugandan population, rare
Hooded Vulture	ACCIPITRIDAE	Necrosyrtes	monachus	EN	EN C I	Throughout Uganda	Sub-Saharan Africa	Savanna, built-up areas	Poisoning	Decline	Protected by law	Better enforcement and prosecution	Uganda numbers for the PA system estimated between 20 - 150 individuals, with populations outside PAs (Pomeroy et al 2014). Global estimate 197,000.
African White-backed Vulture	ACCIPITRIDAE	Gyps	africanus	EN	EN C I	Significant populations in Queen Elizabeth National Park, Murchison Falls National Park	Sub-Saharan Africa except Equatorial Africa and southern South Africa. <1% Uganda	Savanna/rangelands	Poisoning	Decline	Protected by law	Better enforcement of protection and prosecution	Mainly confined to PA's but occasionally over pastoral areas. Uganda numbers estimated between 1000 to 2600 individuals, 0.4 - 1.0% of global estimate of 270,000 (Pomeroy et al, 2014).
Ruppell's Griffon Vulture	ACCIPITRIDAE	Gyps	rueppelli	EN	EN C I	Queen Elizabeth National Park, Murchison Falls National park, Lake Mburo National Park	Sahel and East Africa	Savanna	Poisoning and habitat degradation	Decline	Protected by law	Better enforcement of protection measures and prosecution	Previous records from Kabwoya Wildlife Reserve, QENP, LMNP, KVNP, Lake Kyoga, Lake Opeta and West Nile. No recent breeding records for Uganda. Uganda numbers estimated between 100 to 500 individuals in the PA system, also occurs in lower densities in pastoral land (Pomeroy et al 2014). MFNP most significant population. Unknown global populations with rapid declines reported throughout range, esp West Africa)
Lappet-faced Vulture	ACCIPITRIDAE	Torgos	tracheliotus	VU	CR C I	Queen Elizabeth National Park, Lake Mburo National Park, Murchison Falls National Park, Semliki Wildlife Reserve	Widespread distribution though uncommon and declining in Africa,	Savanna	Poisoning	Decline	Protected by law, occurs in PA's	Better enforcement of protection and prosecution	Previously recorded near Mt Elgon, near Bwindi and West Nile. Uganda numbers estimated between 160 to 500 individuals, which is 2 to 6% of the global population (Pomeroy et al 2014)

**Proposed National Redlist for Uganda: Evaluated Bird Species**

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
							Sahel to Southern Africa except Equatorial Africa. 1% Uganda						
White-headed Vulture	ACCIPITRIDAE	Trigonoceps	occipitalis	VU	CR CI	Kidepo Valley National Park, Lake Mburo National Park, Queen Elizabeth National Park, Semliki Wildlife Reserve, Murchison Falls National Park	Eastern Africa and scattered through Sahel and Southern Africa. <5% Uganda	Semi-arid/savanna	Poisoning	Decline	Protected by law, occurs in PA's	Better enforcement of protection and prosecution	Previously recorded from Kabwoya Wildlife and Pian Upe Wildlife Reserves and West Nile. Uganda numbers in the PA system estimated between 30 to 150 individuals with potential populations in pastoral land (Pomeroy et al 2014)
Short-toed Snake Eagle	ACCIPITRIDAE	Circaetus	gallicus	LC	NT	No specific locations	Non-breeding resident in Sub-Saharan Africa, breeds North Africa and Europe. Non-migratory populations in South-East Asia	Savanna	Habitat disturbance	Unknown			Non-breeding resident. In decline in breeding areas in Northern Europe. Less than 20 records in Uganda. Species status in question- as to whether beaudoini is a separate species. Probably rare in Uganda but no population estimations or limited AOO/EOO
Brown Snake Eagle	ACCIPITRIDAE	Circaetus	cinereus	LC	LC	Queen Elizabeth National Park, Lake Mburo National Park, Murchison Falls National Park, Lake Victoria, Lake Kyoga, Lake Albert, Lake Opeta IBA, Karamoja sub-region (Mt Elgon), West Nile Region	Sahel belt and Eastern Africa		habitat disturbance				
Western Banded Snake Eagle	ACCIPITRIDAE	Circaetus	cinerascens	LC	NT	Queen Elizabeth National Park, Lake Mburo National Park, Rwenzori Mountains National Park, Semliki National Park, Lake Victoria, Lake Kyoga, Lake Albert, Lake Opeta IBA, Karamoja sub-region (Mt Elgon), West Nile Region	West-Central Africa, excluding Guineo-Congolian Region	Riverine forest	Habitat disturbance and degradation	Suspected decline	Partial - range includes but not limited to PA's		Widespread but not common. Believed to be in decline due to disturbance and destruction of Riverine Forest
Bateleur	ACCIPITRIDAE	Terathopus	ecaudatus	NT	LC	Wide spread	Sub-Saharan except Guineo-Congolian Region	Savanna	habitat disturbance, poisoning and pollution				Declining throughout global range, yet still considered fairly wide spread and common in Uganda.
Pallid Harrier	ACCIPITRIDAE	Circus	macrourus	NT	CR CI+2a(i)	Queen Elizabeth National Park, Lake Mburo National Park, Lake Victoria, West Nile Region, Murchison Falls National Park, Kibale Valley National Park, Karamoja sub-region	Sahel, East to Southern Africa except Guineo-Congolian region. <1% Uganda	Open grassland	Habitat disturbance, over grazing, fire	Decline	Partial - range includes but not limited to PA's	Better management of rangelands	Palaearctic migrant - recent records almost entirely Albertine Rift and Karamoja
Montagu's Harrier	ACCIPITRIDAE	Circus	pygargus	LC	NT	Queen Elizabeth National Park, Murchison Falls National Park, Kidepo Valley National Park, Lake Victoria, River Nile, Karamoja sub-region	Sub-Saharan except Guineo-Congolian Region	Grasslands	Habitat disturbance	Decline	Partial - range includes but not limited to PA's		Migrant and known to be declining throughout global range. Uncommon, scattered records, few numbers
African Marsh Harrier	ACCIPITRIDAE	Circus	ranivorus	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, Kidepo Valley National Park, Semliki Wildlife Reserve, Kabwoya Wildlife Reserve, Lake Victoria, Lake Bunyonyi, Lake Kyoga	Mainly Eastern and southern Africa		habitat disturbance				
Ovambo Sparrowhawk	ACCIPITRIDAE	Accipiter	ovampensis	LC	VU DI	Kabarole District (vicinity of Kibale National Park), Lake Victoria (Port Bell), West Nile region	Sub-Saharan except Guineo-Congolian Region	Riverine and open woodland	habitat disturbance	Lost recently in areas where it was known to occur	Partial - range includes but not limited to PA's	Establish core areas and conservation programme	Possibly declining through habitat loss. Rarely seen so presumed to be fewer than 1000 mature individuals
Rufous-breasted Sparrowhawk	ACCIPITRIDAE	Accipiter	rufiventris	LC	DD	Echuya Forest Reserve, Bwindi Impenetrable National Park, Karamoja (Mt Elgon), Lake Mburo National Park and vicinity, Mbuku Valley, Lake Victoria	Scattered populations Eastern Africa from Ethiopia to South Africa and Angola	forest and forest edge, woodland	Small population, habitat degradation likely to affect food source	Unknown	Partial - range includes but not limited to PA's	Establish status	Very little known, small number of records

Proposed National Redlist for Uganda: Evaluated Bird Species

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
Mountain Buzzard	ACCIPITRIDAE	Buteo	oreophilus	NT	VU D I	Bwindi Impenetrable National Park, Rwenzori Mt National Park, Mt Elgon National Park, Mgahinga National Park	East Africa, including Albertine Rift. <5% Uganda	Montane forest 1800 - 4000m	potential habitat disturbance	Presumed stable	Occurs within PA's	Ensure protection of key habitat	Uncommon . Globally declining due to destruction and degradation of montane forest, potentially 670 to 6700 mature individuals in total
Ayres's Hawk Eagle	ACCIPITRIDAE	Hieraaetus	aynesii	LC	VU D I	Bwindi Impenetrable National Park (at lower altitudes), Kibale National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Lake Victoria, Karamoja sub-region (Mt Elgon vicinity)	Widespread in Africa	Forest and riverine woodland	habitat loss, quality of habitat	Declining	Partial - range includes but not limited to PA's	Establish key locations and increase protection	Scarce where it occurs - but found throughout southern Uganda in forest and woodland. Estimated that fewer than 1000 mature individuals hence DI
African Crowned Eagle	ACCIPITRIDAE	Stephanoaetus	coronatus	NT	EN C2a(i)	Budongo Forest Reserve, Bugoma Forest Reserve, Kibale Forest Reserve, Bwindi Impenetrable National Park, Rwenzori Mountains National Park, Lake Victoria, Bwamba (historical record, Semliki National Park), Maramagambo Forest Reserve	Sub-Saharan Africa. <1% Uganda	Thick forest - forest regions of south and south west Uganda	Habitat degradation and fragmentation	Declining forest cover in Murchison Semliki landscape - presume declining prey and eagle numbers	Occurs within PA's	Establish monitoring and conservation programme based on results	Probably few pairs in each forest as require large ranges. Forest loss is leading to inferred decline in numbers
Martial Eagle	ACCIPITRIDAE	Polemaetus	bellicosus	VU	LC	Bwindi Impenetrable National Park, Murchison Falls National Park, Kibale National Park, Kidepo Valley National Park, Kabwoya Wildlife Reserve, Budongo Forest, West Nile Region, Karamoja sub-region (Mt Elgon), Lake Victoria,	Sub-Saharan Africa except Guineo-Congolian region	Open woodland and bushland	Habitat disturbance				
Secretary Bird	SAGITTARIIDAE	Sagittarius	serpentarius	VU	VU D I	Queen Elizabeth National Park, Murchison Falls National Park, Kidepo Valley National Park	Sub-Saharan Africa except Guineo-Congolian Region	Open grassland	Over-grazing, exploitation	Presumed decline			Recent records, low numbers. Rapid decline throughout global range, especially Tanzania and South Africa
Lesser Kestrel	FALCONIDAE	Falco	naumanni	LC	VU D I	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, Kidepo Valley National Park, Lake Kyoga, Lake Opeta IBA	Africa and Asia - Uganda very small pop	Grasslands and farmland, rice paddis		Declining worldwide - may be declining in Uganda as a result	Partial - range includes but not limited to PA's		Winters in sothern Africa - Uganda as a transit country . Few ever seen in Uganda
Greater Kestrel	FALCONIDAE	Falco	rupicoloides	LC	DD	Southern Karamoja, Murchison Falls National Park	Eastern Africa and Southern Africa	Acacia woodland	Unknown	Unknown	Partial - range includes but not limited to PA's	Establish status	Only 2 records in Uganda - Karamoja 1965, Murchison 1985. No recent records
Fox Kestrel	FALCONIDAE	Falco	alopex	LC	EN (C2a(i))	Murchison Falls National Park, Kidepo Valley National Park, Karamoja sub-region, West Nile Region	Sahelian Africa but not to East coast	Acacia woodland	Charcoal, habitat disturbance	Decline	Partial - range includes but not limited to PA's	Establish conservation programme	Recent records for Iriri, southern Karamoja, KVNP and MFNP. Believed to be globally stable
Red-necked Falcon	FALCONIDAE	Falco	chicquera	LC	LC	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, Kabwoya Wildlife Reserve, Lake Victoria, Lake Kyoga, West Nile Region, Kidepo Valley National Park, Semliki Wildlife Reserve, Lake Opeta	Sub-Saharan Africa except Guineo-Congolian Region	Forest, woodland					Declining rapidly in parts of its range (estimated by 50% in Kenya between 1970 - 1990's). Global status less certain since split with F. chicquera
Taita Falcon	FALCONIDAE	Falco	fasciinucha	VU	RE	Mt Elgon National Park	East Africa	Cliffs	Habitat conversion	Decline			Historical records only
African Blue Quail	PHASIACIDAE	Synoicus	adansonii	LC	DD	Queen Elizabeth National Park (Kyambura Craters), Lake Mburo National Park, Kidepo Valley National Park, West Nile Region, Lake Kyoga, Lake Victoria, Lake Opeta, Lake Bunyonyi	Intra-African migrant	Moist grassland and cultivation below 1800m	Overgrazing, drainage, habitat conversion	Probably declining	Partial - range includes but not limited to PA's	Establish status	Rarely seen (dry season only) - uncertain about numbers or whether declining. Old breeding records only. Formerly grouped with S. chinensis as Coturnix chinensis (Blue Quail)

Proposed National Redlist for Uganda: Evaluated Bird Species

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
Ring-necked Francolin	PHASIANIDAE	Francolinus	streptophorus	NT	VU C2a(i)	Murchison Falls National Park, Queen Elizabeth National Park, Kidepo Valley National Park, Kabwoya Wildlife Reserve, West Nile region	Disjunct populations in Uganda (up to 50%), Kenya, and Rwanda, Burundi, Tanzania	Bushland mixed with wooded areas	Hunting, habitat loss	Declining outside PAs	Partial - range includes but not limited to PA's	Establish status	Low density where it occurs and declining outside protected areas. Uganda previously presumed as stronghold but paucity recent records suggests major decline. Population globally less than 20,000.
Red-winged Francolin	PHASIANIDAE	Francolinus	levaillantii	LC	DD	Kabarole District	Albertine Rift, Kenya, Tanzania, Angola, Zambia, Mozambique, South Africa	Less open scrubby habitats, cultivation, mostly below 1500m	Hunting, habitat degradation	Decline	None	Establish status	Very few records for this species, all from southern Uganda
Elgon Francolin, Moorland Francolin	PHASIANIDAE	Scleroptila	elgonensis	NT	VU D1	Mt Elgon National Park	Uganda/Kenya. >10% Uganda	Moorland above 2500m	Loss and degradation of habitat due to agriculture and overgrazing	Presumed decline	Occurs within National Park	Establish status and threats. Enforce moorland protection	Name changed to Mt Elgon Francolin, previously grouped with <i>S. psilolaema</i> as <i>Francolinus psilolaemus</i> . Recent records Mt Elgon. AOO less than 500km so given likelihood of decline should be upgraded to EN. At present listed as VU as presumed less than 1000 individuals and restricted range for now.
Orange River Francolin, Archer's Francolin	PHASIANIDAE	Scleroptila	gutturalis	LC	DD	Kidepo Valley National Park, Mt Moroto	East Africa/Ethiopia	Wooded grassland/savanna woodland	Unknown	Unknown	Occurs within PA's	Establish status	Only three old records for Uganda. Previously classed as <i>Francolinus levaillantoides</i>
Nahan's Francolin	PHASIANIDAE	Ptilopachus	nahani	NE	VU B2ab(iii)	Budongo Forest Reserve, Bugoma Forest Reserve, Mabira Forest Reserve	DRC, Uganda. >50% Uganda	Intact forest 1000-1400m	Habitat degradation	Decline	Occurs mainly within FRs	Study actual AOO and establish habitat requirements. Enforcement to prevent further forest degradation	Formerly included as <i>Francolinus nahani</i> . Numbers in Uganda estimated at 44,038 individuals (Fuller et al, 2004) and numbers in DRC where it is reported as rare and scattered, may be similar or less. AOO shows as 1081km <sup>2</sup> based on area of Tropical High Forest in the PA's, however, much of this forest is already heavily degraded and so likely that this Albertine Rift endemic should be much more highly ranked.
Handsome Francolin	PHASIANIDAE	Francolinus	nobilis	LC	VU B2ab(v)	Rwenzori Mt National Park, Bwindi Impenetrable National Park	Albertine Rift Endemic. 10% Uganda	montane forest 1800 - 3700m	Hunted	Decline	Occurs within National Parks	Establish monitoring programme	Very limited distribution, Albertine Rift endemic
Quail Plover	TURNICIDAE	Ortyxelos	meiffreni	LC	DD	Kidepo Valley National Park	Sahel and East Africa	grassland, rocky hillsides	Unknown	Unknown	Occurs within National Park	Establish status	Only one recent record in Kidepo, not known elsewhere. Uganda as fringe of habitat
Black-rumped Button Quail	TURNICIDAE	Turnix	hottentotta	LC	EN B1ab(iii,v)	Queen Elizabeth National Park (Ishasha sector), Kabwoya Wildlife Reserve, Murchison Falls National Park, Lake Victoria, Lake Albert, Karamoja sub-region (Mt Elgon).	Southern Africa from Kenya, also Nigeria, Cameroon. 5% Uganda	Wooded grasslands	Overgrazing, cultivation, fire	Declining inferred from Habitat loss	Partial - range includes but not limited to PA's	Establish monitoring and habitat management (grazing and fire regimes)	Historically recorded from 7 sites in south-west Uganda, only recently recorded in Queen Elizabeth National Park. Globally believed to be declining from Habitat loss and exploitation
Nkulengu Rail	RALLIDAE	Himantornis	haematopus	LC	DD	Semliki National Park	West and Central Africa, Uganda as Eastern limit	Swamp	Habitat conversion, wetland drainage	Decline	Occurs within National Park	Establish status and AOO	Very few records, only from Semliki, recent observations
Red-chested Flufftail	RALLIDAE	Sarothrura	rufa	LC	DD	Kisoro, Kampala, Masindi	Widely distributed through sub-Saharan Africa	Forest streams, marshes, swamps and reedbeds, small ponds with sufficient cover	Habitat degradation	Unknown	None	Establish status	Few, scattered records. Declining throughout global range
African Crane	RALLIDAE	Crex	egregia	LC	NT	Murchison Falls National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Lake Mburo National Park, Kidepo Valley National Park, West Nile region, Lake Victoria, Lake Albert, Lake Kyoga	West to East Africa but does not breed in southern part of range (southern DRC, Tanzania to South Africa)	Grasslands, farmlands and wetlands	Habitat conversion, over-grazing, consumption	Believed stable	Partial - range includes but not limited to PA's		Almost certainly under-recorded may be quite common. Population suspected to be globally stable
Corncrake	RALLIDAE	Crex	crex	NT	DD	West Nile Region, Murchison Falls National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Lake Mburo National Park, Lake Victoria, Lake Bunyonyi, Lake Kyoga, Karamoja sub-region (Mt	Palaearctic	Grassland	Overgrazing, wetland drainage, habitat conversion	Probably declining	Partial - range includes but not limited to PA's	Establish status and current AOO	Less than 10 records for Uganda, most are old records - too little data to make decision.



Proposed National Redlist for Uganda: Evaluated Bird Species

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
						Elgon)							
Baillon's Crane	RALLIDAE	Porzana	pusilla	LC	DD	Lake Bunyoni, Lake Mutanda, Queen Elizabeth National Park, Kibimba Rice Scheme IBA	Palaearctic	Swamps	Drainage, habitat conversion	Unknown	Partial - range includes but not limited to PA's	Establish status	Only 4 records, possibly others. - too few data to make decision. 1 race known to breed in Africa (check location BoA)
Striped Crane	RALLIDAE	Aenigmatolimnas	marginalis	LC	DD	Lake Edward, Lake Victoria, Wakiso District (Namulonge), Kibimba Rice Scheme IBA	West Africa, main range Niger, Nigeria and visiting populations in Albertine Rift area	Wet grass, shallow pools	Hunting, habitat deradation and conversion, poison	Presumed stable	None	Establish status	6 records in Uganda. Recently recorded only in rice schemes: Dhoho rice scheme, Kibimba. Uganda as fringe of range
Black-crowned Crane	GRUIDAE	Balearica	pavonina	VU	CR C1	West Nile Region	Sahel, West Africa to Uganda, main range Sudan and South Sudan. 1-2% Uganda	Seasonal wetlands	Habitat conversion (agriculture), hunting, poisoning	Decline	Protected by law	Better enforcement and prosecution	Vagrant, not known to breed in Uganda
Grey Crowned Crane	GRUIDAE	Balearica	regulorum	EN	EN A2b	Widespread in moist non-forest areas	East and southern Africa. 30% Uganda	Breeds only in seasonal wetlands,	Seasonal wetlands converted to agriculture, some hunting/illegal trade	Decline	Protected by law, partial - range includes, but not limited to PA's	Better enforcement and protection of key habitats	Evidence of 70% decline in Uganda over last 40 years. Declining rapidly throughout range - total estimate of 50,000 - 64,000 birds of which Uganda believed to have 15,000 - 20,000.
African Finfoot	HELIORNITHIDAE	Podica	senegalensis	LC	VU C2a(i)	Murchison Falls National Park, Queen Elizabeth National Park, Lake Mburo National Park, Semliki River, Lake Albert	Sub-Saharan Africa	Slow-moving rivers/lakes with overhanging trees	Habitat disturbance, siltation and fluctuating river flow	Decline	Partial - range includes but not limited to PA's	Establish AOO and threats	Old record on ENTEBBE PENINSULA. Population suspected to be less than 1000 and habitat degradation increasing. (Very linear AOO also likely to be less than 2000km <sup>2</sup> ). Known to be declining though most of range
Denham's Bustard	OTIDIDAE	Neotis	denhami	NT	CR D	Murchison Falls National Park	Most of sub-Saharan Africa. <2% Uganda	Open short grassland	Isolation - very low numbers	Decline	Occurs within National Park	Establish appropriate fire management regimes	Previously recorded as being widely scattered mainly in Northern Uganda
Kori Bustard	OTIDIDAE	Ardeotis	kori	NT	DD	Kidepo Valley National Park	East Africa (Ethiopia to Tanzania) and southern Africa (Angola and Mozambique to South Africa)	Arid bush, Grassland	Unknown	Suspected decline	Occurs within National Park	Establish status	Less than 10 records, could be a vagrant. Has been raised to NT globally due to declining populations throughout global range.
Buff-crested Bustard	OTIDIDAE	Eupodotis	gindiana	LC	DD	Karamoja sub-region	East Africa	Arid bush, Grassland	Unknown	Unknown	None	Establish status	Common resident in adjacent areas in Kenya, rarely recorded in Uganda, no breeding records. Believed to be stable throughout global range in absence of evidence of decline
Hartlaub's Bustard	OTIDIDAE	Eupodotis	hartlaubii	LC	EN C2a(i)	Kidepo National Park, South Karamoja	Scattered populations East Africa from Sudan to Tanzania	Grassland	Hunting	Decline	Partial - range includes but not limited to PA's	Establish conservation programme	Karamoja/Kidepo but rarely seen. Believed to be globally stable.
Lesser Jacana	JACANIDAE	Micropodops	capensis	LC	LC	Queen Elizabeth National Park, Lake Mburo National Park, Lake Victoria, Lake Kyoga, Lake Albert	Patchy distribution Sub-Saharan Africa except Guineo-Congolian region	Wetlands					
Rock Pratincole	GLAREOLIDAE	Glareola	nuchalis	LC	VU C2a(i)	Murchison Falls National Park, Lake Victoria (north shore), Victoria Nile, Lake Albert (southern shores), West Nile region	SubSaharan Africa south to Zimbabwe, Mozambique	Rocky areas or sandbars in lakes or rivers	Hydro dams, loss of rocky islands where they breed	Decline seen from large groups to few individuals these days	Partial - range includes but not limited to PA's	Protect or create suitable habitat within lakes in AOO	Old records indicated 5-600 birds at a site - these days few numbers at any location
Brown-chested Lapwing	CHARADRIIDAE	Vanellus	superciliosus	LC	VU D1	Queen Elizabeth National Park, Lake Mburo National Park, Lake Victoria (western shores)	Breeding range a narrow strip from Nigeria to Northern DRC, non-breeding range East to Kenya and south to Zambia	Wide range of dry grassy habitats, esp. burnt grasslands	Habitat disturbance	Unknown	Partial - range includes but not limited to PA's		Intra-african migrant. All recent records south of equator (Lake Mburo). Global population size uncertain, from 670-17000 and trends therefore hard to establish.
Great Snipe	SCOLOPACIDAE	Gallinago	media	NT	VU C2a(i)	Murchison Falls National Park, Lake Mburo National Park, Semliki Wildlife	Breeding populations North Europe to Asia,	Swamps, paddy fields, wet grass lake edge	Habitat disturbance	Decline	Partial - range includes but not		Palaearctic visitor. Numbers declining globally over long period and may be uplisted.

Proposed National Redlist for Uganda: Evaluated Bird Species

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
						Reserve, West Nile region, Lake Victoria, Lake Albert, Lake Kyoga	overwinters Guineo-Congolian Region				limited to PA's		
African Skimmer	RYNCHOPIDAE	Rynchops	flavirostris	NT	VU C2a(i)	Murchison Falls National Park, Queen Elizabeth National Park, Lake Victoria, Albert Nile	Sub-Saharan Africa - Uganda may have 10% pop	Rivers and lakes - sandbanks for resting	Water level changes or issues affecting fish prey	Declining	Partial - range includes but not limited to PA's	Establish and control threats	500 in QENP, Flocks of 200+ in MFNP, Entebbe flocks. Thought to breed in Uganda (Uganda bird atlas)
Lemon Dove, Cinamon Dove	COLUMBIDAE	Aplopelia	larvata	LC	LC	Rwenzori Mountain National Park, Kidepo Valley National Park, Karamoja sub-region ( Mt Elgon), Lake Victoria, Kigezi Highlands, Lake Albert	Patchily distributed through Sub-Saharan Africa	Forest					Secretive, may be under reported.
White-naped Pigeon	COLUMBIDAE	Columba	albinucha	NT	VU C2a(i)	Kibale National Park (Ngogo), Kalinzu Forest Reserve, Kasyoha-Kitomi Forest Reserve, Bwamba Valley (historical record for Semliki National Park)	Albertine Rift (DRC, Uganda, South Sudan), with small disjunct population in Cameroon. <30% Uganda	Forest canopies in mature forest	Hunting and habitat loss/degradation	Inferred from habitat loss	Occurs within PA's	Enforce protection of mature forest, including strict protection zones and logging control.	Everywhere rare, breeding success appears low.
Grey Parrot	PSITTACIDAE	Psittacus	erithacus	VU	VU C1	Bwindi Impenetrable National Park, Mabira Forest Reserve, Maramagambo Forest Reserve, Lake Victoria (including Islands)	Guineo-Congolian Region to Kenya. <20% Uganda	Forest species, adaptable needs large trees	Deforestation, hunting	Decline	Partially where within forest reserves - license needed for captive parrots	Better enforcement of protection	Still very widespread despite threats, but increasing fragmentation and reduction in habitat
Brown-necked Parrot	PSITTACIDAE	Poicephalus	suahelicus	LC	DD	Bwindi Impenetrable National Park	Sub-Saharan Africa	Tropical forest	Unknown	Unknown	Occurs within National Park	Establish current status and whether any substantive threats	Many records but only from Bwindi (ref Butynski and Kalini 1989, noting several hundred observations). Generally scarce and declining but patchily common throughout global range
Hartlaub's Turaco	MUSOPHAGIDAE	Tauraco	hartlaubi	LC	VU B2ab(iii)	Mt Elgon National Park, Mt Moroto, Mt Morongole	Confined to Kenya, Tanzania and up to 10% Uganda	Montane forest 2000-2700m	Forest loss and degradation	Decline	Occurs within PA's	Improved forest management and protection	Very few records - recent records for Mt Elgon
Purple-crested Turaco	MUSOPHAGIDAE	Musophaga	porphyreolophus	LC	DD	Rakai District (Kagera River)	East Africa from Kenya to eastern South Africa	Tropical forest	Habitat degradation and conversion	Suspected decline	None	Establish status	Not reliably recorded for 50 years- Kigera River. Declining throughout global range
Rwenzori Turaco	MUSOPHAGIDAE	Gallirex	johnstoni	LC	NT	Rwenzori Mountains National Park, Bwindi Impenetrable National Park (confined to SW of Park), Echuya Forest Reserve, Mgahinga National Park	Albertine Rift endemic: DRC, Rwanda, Burundi. 30% Uganda	Montane and tropical forest		Believed stable	Occurs within PA's		Albertine Rift endemic, believed fairly comon and stable throughout range (syn. Musophaga)
Barred Long-tailed Cuckoo	CUCULIDAE	Cercococcyx	montanus	LC	NT	Rwenzori Mountains National Park, Bwindi Impenetrable National Park, Echuya Forest Reserve	Albertine rift endemic	Forest		Believed stable	Occurs within PA's		Uncommon throughout global range but no evidence for decline. Previously sighted for East Africa, now considered endemic for Albertine Rift
Black Coucal	CUCULIDAE	Centropus	grillii	LC	NT	Queen Elizabeth National Park, Murchison Falls National Park, Lake Mburo National Park, Kidepo Valley National Park, Kabwoya Wildlife Reserve, Lake Kyoga, Lake Albert (southern end), West Nile Region	Sub-Saharan Africa	Grasslands, farmlands and wetlands		Presumed stable			Recently seen throughout normal range in Uganda. Scarce throughout global range but presumed stable in absence of evidence of decline
African Grass Owl	TYTONIDAE	Tyto	capensis	LC	DD	Echuya Forest Reserve, Mbarara District, Busoga sub-region	Southern Africa from DRC, Kenya southwards, disjunct population in Nigeria	Grasslands up to 3200m	Habitat conversion	Decline	Partial - range includes but not limited to Forest Reserve	Establish current AOO and numbers	Scarce resident throughout global range. Less than 10 records, last record 1997 Echuya
Fraser's Eagle Owl	STRIGIDAE	Bubo	poensis	LC	DD	Semliki National Park, Bwindi Impenetrable National Park (Buhoma)	West and Central Africa, Uganda/Rwanda as Eastern limit	Intact high altitude forest, yet seen in Semliki	Unknown	Unknown	Occurs within National Parks	Establish status	Only 5 records, 1 recent for 2015. Fairly common throughout global range although declining.
Pel's Fishing Owl	STRIGIDAE	Scotopelia	pele	LC	EN D2	Murchison Falls National Park, Ajai Wildlife Reserve, Semliki Wildlife Reserve	Widely distributed through sub-Saharan Africa	Large rivers with overhanging vegetation	Human disturbance, loss or degradation of habitat	Unknown	Occurs within PA's	Ensure protection of riverine forest	Few in Uganda as a whole - rarely seen. Probably fewer than 100 in Uganda - global population presumed stable in absence of evidence of decline



**Proposed National Redlist for Uganda: Evaluated Bird Species**

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
Red-chested Owllet	STRIGIDAE	Glaucidium	tephronotum	LC	VU B2ab(iii)	Rwenzori Mt National Park, Bwindi Impenetrable National Park, Kalinzu Forest Reserve, Budongo Forest Reserve	West and Central Africa, to Kenya	Medium altitude forest Albertine Rift up to 2100m	Degradation, loss of habitat	Suspected decline	Occurs mainly within FRs	Improve forest management and protection. Study present AOO	Understudied - rarely heard. Previously more widespread, recorded in Mt Elgon
Marsh Owl	STRIGIDAE	Asio	capensis	LC	VU D1	Murchison Falls National Park, Queen Elizabeth National Park, Mt Elgon National Park (western slopes), Semliki Valley	Sub-Saharan Africa and Northern Africa	Swamp and grassland	Habitat conversion and decline	Decline	Partial - range includes but not limited to PA's	Establish current AOO and breeding status	All old records. No breeding records but assumed
Sabine's Spinetail	APODIDAE	Rhaphidura	sabini	LC	NT	Mabira Forest Reserve, Kalinzu-Maramagambo Forest Reserve, Budongo Forest Reserve, Bwamba (historical record for Semliki National Park), Murchison Falls National Park (Rabongo Forest)	West-Central Africa and Uganda, Burundi, Rwanda. Absent central DRC. <5% Uganda	Medium altitude forest up to 1600m		Presumed stable			Recent records within range, but have disappeared from former parts of range, e.g. Kifu forest near Kampala (Fishpool 1993 Scopus 17 p. 37), which is now entirely cleared (Hugh Rowell in litt 2014). Common throughout global range and believed to be stable.
Mottled-throated Spinetail	APODIDAE	Telacanthura	ussheri	LC	DD	Mabira Forest Reserve, Budongo Forest Reserve, Bwamba (Historical record, Semliki National Park), Maramagambo Forest Reserve	West and Central Africa, Uganda as Eastern limit	Medium altitude forest up to 1600m	Unknown	Unknown	Occurs within PA's	Establish status and current AOO	Not enough known about numbers but distribution is limited
Cassin's Spinetail	APODIDAE	Neafrapus	cassini	NT	DD	Budongo Forest Reserve, Bugoma Forest Reserve, Mabira Forest Reserve	West and Central Africa, Uganda as Eastern limit	Moist primary forest	Habitat clearance	Presumed decline	Occurs within Forest Reserves	Establish status and current AOO	Old record from BWAMBA LOWLANDS. Not enough known about its numbers but presumed declining as appears absent from part of former AOO - distribution is limited. Previously observed in Kifu forest near Kampala (Fishpool 1993 Scopus 17 p. 37), which is now entirely cleared (Hugh Rowell in litt 2014).
Scarce Swift	APODIDAE	Schoutedenapus	myioptilus	LC	DD	Rwenzori Mountain National Park, Bwindi Impenetrable National Park (Itama River), Mt. Moroto, Kibimba Rice Scheme IBA, Moyo District (Laropi), Murchison Falls National Park, Kabale District Highlands	Scattered populations DRC, Burundi, Rwanda, Uganda, Kenya, Zambia, Zimbabwe, Malawi	Montane regions of south-west Uganda, mainly over 1500m. Breeding on crags	None known	Unknown	Partial - range includes but not limited to PA's	Establish status	Unsure about numbers - appears to be declining as observed less frequently than in recent past. No previous breeding records for Uganda but believed resident. Most observations from over forest, less commonly over open ground.
African Swift, African Black Swift	APODIDAE	Apus	barbatus	LC	DD	Queen Elizabeth National Park, Mt Moroto	Very scattered populations in West, East and Southern Africa	High-altitude. Ranges widely over adjacent low-lying areas	Unknown	Unknown	Occurs within PA's	Establish status	Poorly known and old records from Karamoja and Mt Elgon. Scattering of recent records. Need idea of numbers and distribution
Chocolate-backed Kingfisher	ALCEDINIDAE	Halcyon	badia	LC	NT	Queen Elizabeth National Park, Rwenzori Mountain National Park, Budongo Forest Reserve, Lake Albert	Guineo-Congolian Region	Low- medium altitude forest up to 1300m	Habitat degradation	Unknown	Partial - range includes but not limited to PA's		Budongo as core habitat, Uganda as eastern limit
White-bellied Kingfisher	ALCEDINIDAE	Alcedo	leucogaster	LC	DD	Semliki National Park, Queen Elizabeth National Park, Rwenzori Mountain National Park	West and Central Africa, Uganda as Eastern limit	Streams in dense forest	Habitat degradation	Unknown	Occurs within National Parks	Establish numbers and threats	4 recent records. Believed to be stable globally
Shining-blue Kingfisher	ALCEDINIDAE	Alcedo	quadribrachys	LC	VU C2a(i)	Lake Mburo National Park, Maramagambo Forest Reserve, Budongo Forest Reserve, Wambabya Forest Reserve, Bugoma Forest Reserve, Lake Victoria (environs), Lake Edward, Nile Valley, Bwamba Valley (historical record for Semliki National Park)	Guineo-Congolian Region from Cameroon, Ghana, - Uganda is small perc	Mature forest along streams and rivers	Habitat loss/degradation	Loss of habitat in Murchison, Semliki region where species is recorded - inferred pop decline	Partial - range includes but not limited to PA's	Establish status	Rarely encountered in forests - few sightings despite many surveys. Likely that numbers are less than 10000 mature individuals
Giant Kingfisher	ALCEDINIDAE	Megaceryle	maxima	LC	NT	Widespread	Sub-Saharan Africa except arid parts of south-eastern and eastern coasts	Found wherever, there are large trees next to rivers and lakes	Pesticide run-off	Suspected decline			Very widespread but believed to be declining throughout global range due to pesticide run-off
Forest Scimitarbill, Forest	PHOENICULIDAE	Rhinopomastus	castaneiceps	LC	VU B2ab(iii)	Bwindi National Park, Mt Elgon National Park, Kibale National Park, Bugoma Forest Reserve,	Limited distribution West African species with small enclaves in	Moist medium-altitude forest. Mainly canopy-	Deforestation	Presumed decline	Partial - range includes but not limited to PA's	Study status including breeding locations	Uncommon. Recorded breeding in Bugoma in 1967. Less than 1000km2 AOO, no known recent records. Suspected decline throughout range. (syn. Phoeniculus)

Proposed National Redlist for Uganda: Evaluated Bird Species

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
Wood Hoopoe						Maramagambo Forest Reserve, Lake Victoria (near north shore)	DRC, Uganda, Rwanda	dwelling among creepers					
Hemprich's Hornbill	BUCEROTIDAE	Tockus	hemprichii	LC	EN B2ab(iii)	Karamoja sub-region (Mt Moroto)	Main range Ethiopia with smaller populations in Djibouti, Eritrea, Somalia, South Sudan, Kenya. 5% Uganda	Acacia woodland	Habitat loss, charcoal extraction	Presumed decline	None	Establish status	Scarce and little known, no known recent records
Red-faced Barbet	CAPITONIDAE	Lybius	rubrifacies	NT	VU D1	Lake Mburo National Park, Mbarara District (Murema, Lugaga)	Rwanda, Burundi, Tanzania. 30% Uganda	Acacia woodland	None known	Presumed stable	Partial - range includes but not limited to PA's	Establish current AOO and whether habitat decline is affecting the species	All recent records LMNP. Probably less than 250 mature individuals but no known effect of loss of habitat or decline noted for Uganda, although decline noted in Tanzania..
Black-breasted Barbet	CAPITONIDAE	Pogonornis	rolleti	LC	VU D1	Murchison Falls National Park, Kidepo Valley National Park, Ajai Wildlife Reserve	Chad, CAR, Sudan, South Sudan and northern Uganda. <5% Uganda	Wooded grassland	Removal or burning of dead trees	Unknown	Occurs within PA's	Improve fire management regime and enforce ban on fuelwood extraction to protect dead trees	Only about 10 records all from KVNP and MFNP. Very few seen. Global decline due to desertification and removal of dead trees needed for nesting. (syn. Lybius)
Crested Barbet	CAPITONIDAE	Trachyphonus	vallantii	LC	DD	Lake Mburo National Park, Queen Elizabeth National Park	Central to Southern Africa	Acacia grassland	Unknown	Unknown	Occurs within National Parks	Establish AOO and threats	6 recent records in Uganda. Globally declining due to persecution and trade
Dwarf Honeyguide	INDICATORIDAE	Indicator	pumilio	NT	EN D	Bwindi Impenetrable National Park	Albertine Rift Endemic. 10% Uganda	intact forest 1500-2400 m	Isolation - low numbers	Decline due to habitat degradation	Occurs within National Park	Needs total count and protection of specific habitat from degradation	Suspected rapid decline throughout global range due to habitat degradation and loss. No population estimates. Expected decline within Uganda as requires intact forest. Survey to ascertain.
Pallid Honeyguide	INDICATORIDAE	Indicator	meliphilus	LC	DD	Mt Moroto	Angola, Congo, Tanzania, Kenya, Uganda, Zimbabwe, Zambia	Forest	Unknown	Unknown	Occurs within Forest Reserve	Establish status	Hasn't been recorded for over 50 years, including recent survey of Mt Moroto. Likely to be edge of range
Rufous-necked Wryneck, Red-throated Wryneck	PICIDAE	Jynx	ruficollis	LC	VU C2a(i)	West Nile region, Buhoma area adjacent to Bwindi Impenetrable National Park, Kyegegwa District, Kigezi Highlands	Scattered populations, Central, East and Southern Africa	Clearings and forest edge, scrub gardens and cultivation with trees	Low numbers, other threats unknown	Decline	None	Establish monitoring and conservation programme based on results	Records all south and west, no recent records for Uganda. Record for Malabigambo in 2000's
African Green Broadbill	EURYLAIMIDAE	Pseudocalyptomena	graueri	VU	EN D	Bwindi Impenetrable National Park (Ruhiza)	Albertine Rift Endemic.DRC/80-100% Uganda	forest and swamp above 2000m	Low numbers and habitat degradation	Unknown	Occurs within National Park	Requires further study/monitoring	Specialists believe it to be critically endangered due to its very limited distribution; likely to be declining if any habitat disturbance occurring, but numbers unknown except for density estimate of 1 mature individual per km (193km of BINP above 2000m so gives potential population of below 200). Has not been recorded in recent surveys in DRC, potentially Uganda endemic
Green-breasted Pitta	PITTIDAE	Pitta	reichenowi	LC	VU D1	Kibale National Park, Budongo Forest Reserve	Scattered populations Cameroon, Equatorial Guinea, Gabon, Central African Republik with majority of range in DRC and Uganda. <30% Uganda	Medium alt and lowland forest - dense understorey vegetation up to 1,400m	Habitat loss and degradation	Inferred decline because of forest loss	Occurs in PA's. Primates may be destroying nests	Establish monitoring programme	Likely less than 1000 at any of the two sites where it has been recorded and rarely seen
African Pitta	PITTIDAE	Pitta	angolensis	LC	VU C2a(i)	Kibale National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Maramagambo Forest Reserve	Resident populations West and Central African coastlines, with second breeding population in southern Africa migrating north to East Africa	Dense woodland and forest in open clearings	Forest loss and degradation	Suspected decline	Occurs within PA's	Establish monitoring and conservation programme based on results	Rarely observed in any site or heard. Likely to be fewer than 1000 at any site where recorded. Suspected to be declining globally due to habitat loss and fragmentation
Chestnut-	ALAUDI	Eremopter	leucotis	LC	DD	Kidepoe Valley National Park	Sub-Saharan except	Wooded grassland	Unknown	Unknown	Occurs within	Establish AOO and	Less than 5 records from KVNP only. Believed to be

Proposed National Redlist for Uganda: Evaluated Bird Species

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
backed Sparrow Lark	DAE	ix					Guineo-Congolian Region				National Park	threats	stable globally
Blue Swallow	HIRUNDINIDAE	Hirundo	atrocaerulea	VU	EN C2a	Lake Victoria, Tororo District, Kidepo Valley National Park (Napori Hills), Maramagambo Forest Reserve, Queen Elizabeth National Park	East and South Africa	Seasonally flooded Grassland	Draining of wetlands for agriculture, burning	Declining numbers observed	Conservation efforts in Southern Africa. Monitoring in Uganda	Continue monitoring and establish conservation programme based on results	Inter-African migrant. Recent surveys only find 150-200 birds at Mabamba, Nabugabo and Sango bay where monitored
White-throated Blue Swallow	HIRUNDINIDAE	Hirundo	nigrita	LC	DD	Semliki National Park	West-Central Africa	Vegetation/trees overhanging river	Unknown	Unknown	Occurs within National Park	Establish status	Under 10 records, rarely encountered. Believed to be increasing globally
Grey Greenbul, Little Grey Greenbul	PYCNOTIDAE	Andropadus	gracilis	LC	LC	Budongo Forest Reserve, Bugoma Forest Reserve, Mabira Forest Reserve, Fort Portal	Guineo-Congolian Region	Forest	Unknown	Unknown	Occurs within PA's		Believed globally stable. Can adapt to degraded forest so numbers may still be reasonable.
Spotted Greenbul	PYCNOTIDAE	Ixonotus	guttatus	LC	NT	Budongo Forest Reserve, Bugoma Forest Reserve, Lake Victoria (Malabigambo)	Guineo-Congolian Region	Forest edge 900 - 1300m	Forest loss and degradation	Unknown	Partial - range includes but not limited to PA's		Locally scarce to common. Believed globally stable
Joyful Greenbul	PYCNOTIDAE	Chlorocichla	laetissima	LC	LC	Mabira Forest Reserve, Budongo Forest Reserve, Kibale National Park, Mt Elgon National Park							Old record from 1930 for Mt Elgon
Simple Greenbul	PYCNOTIDAE	Chlorocichla	simplex	LC	VU D2	Semliki National Park	West Africa/Congo	Forest edge		Presumed stable	Occurs within National Park	Improve protection against degradation	6 records - all Semliki except 1 for QENP. Reasonably common in Semliki, but very limited range
Leaf-love	PYCNOTIDAE	Pyrrhurus	scandens	LC	NT	Semliki National Park, Mabira Forest Reserve, Kifu Forest Reserve, Mpanga Forest Reserve	West and Central Africa, Uganda as Eastern limit	Swamp forest with Pandanus Palms below 1200m	Habitat degradation and conversion	Presumed decline	Occurs within PA's		Reasonably common in Semliki, also recorded from Mabira recently. However possibly no longer persists in Kifu and Mpanga as no recent observations known
Toro Olive Greenbul	PYCNOTIDAE	Phyllastreptus	hypochloris	LC	NT	Kalinzu-Maramagambo Forest Reserve, Bwamba (historical record for Semliki National Park), Rwenzori Mountains National Park, Kibale National Park, Kabarole District	DRC, South Sudan, Kenya, Tanzania. 50% Uganda	forest streams, undergrowth, adjoining cultivation 1500 - 2400m	Deforestation	Possible decline	Partial - range includes but not limited to PAs	Further study to establish AOO	Recent records Fort Portal, Rwenzori, Bwindi, Kalinzu-Maramagambo. Population unknown, AOO appears to be higher than 2000km <sup>2</sup> but habitat within this area could be more limited. Some cause for further attention as the largest part of its range falls within Uganda.
Icterine Greenbul	PYCNOTIDAE	Phyllastreptus	icterinus	LC	NT	Semliki National Park, Budongo Forest Reserve, Bugoma Forest Reserve, Kalinzu-Maramagambo Forest Reserve, Lake Victoria (Sango Bay area)	West and Central Africa, Uganda as Eastern limit	Forest undergrowth	Deforestation	Decline	Partial - range includes but not limited to PA's	Confirm status.	Recent records Semliki, Budongo, Malabigambo (Sango Bay). Bugoma Forest as old record. Subspecies P.i. lorenzi (variously considered a separate species but unconfirmed) much more restricted in range (Ituri/Semliki Forests). Species appears fairly common in forest reserves where these are protected, but severe loss of habitat around Sango Bay forests which are mostly converted to plantations, or agriculture. Possibly LC if threats to forest stabilise
Yellow-throated Nicator	PYCNOTIDAE	Nicator	vireo	LC	NT	Semliki National Park	Guineo-Congolian Region	Foerst and arable	Unknown	Believed stable	Occurs within National Park		Eastern extent of range, 1 location only, but appears to be stable
White-bellied Robin Chat	TURDIDAE	Cossyphula	roberti	LC	CR B1ab(v)	Bwindi Impenetrable National Park	2 distinct populations - Cameroon, Nigeria, and DRC, Rwanda, Burundi. 10% Uganda	Sub-tropical or tropical moist forest species occurs along streams 1500-1630m	Habitat degradation and fragmentation	Presumed decline	Occurs within National Park	Establish status and threats	Very restricted range, previously described as common, rarely recorded, believed to be in decline throughout global range
Archer's Robin-chat, Archer's Ground Robin	TURDIDAE	Cossypha	archeri	LC	LC	Rwenzori National Park, Bwindi Impenetrable National Park, Mgahinga National Park, Echuya Forest Reserve	Albertine Rift endemic.<20% Uganda	Common to abundant along stream sides	Degradation, loss of habitat	Suspected decline			Reasonably common although suspected decline throughout global range.
Red-	TURDID	Alethe	poliophrys	LC	NT	Bwindi Impenetrable National Park,	Albertine Rift endemic.	Bamboo forest	Habitat destruction	Suspected	Occurs within PA's		Not uncommon within AOO, but believed to be

Proposed National Redlist for Uganda: Evaluated Bird Species

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
throated Alethe	AE					Mgahinga National Park, Rwenzori Mountain National Park, Echuya Forest Reserve	10% Uganda	undergrowth 1500 - 2700m	and predation	decline			declining throughout restricted global range
Forest Ground Thrush, Oberlaender's Ground Thrush	TURDIDAE	Zoothera	oberlaenderi	NT	VU D2	Semliki National Park	Albertine Rift endemic.DRC/ 5-10% Uganda	Intact but not dense lowland forest, forest floor (records in Cynometra)	Forest degradation	Decline	Occurs within National Park	Establish threats and improve protection/management of habitat	6 specimens collected in 1960, 4 birds seen 1963, recent record 2014. 1 specimen from Bwindi area 1969. Birdlife recommends uplisting globally due to likelihood it is extirpated in parts of Ituri and Semliki and overall very small population (could uplist as little chance of rescue)
Grauer's Swamp-Warbler, Grauer's Rush Warbler	SYLVIIDAE	Bradypterus	graueri	EN	VU C1)	Muchuya wetland, Mubwindi wetland, Lake Bunyonyi	Albertine Rift Endemic (Rwanda, Burundi, DRC, and <30% Uganda)	Wetland	Burning, stream draining, grass harvesting, wetland degradation	Presumed decline	Partial - range includes but not limited to PA's	Monitoring, strengthen protection of the PA's	200-250km2 AOO estimated globally. Need to revisit as with this AOO should be EN in Uganda too (B2a,biii,v)
Papyrus Yellow Warbler	SYLVIIDAE	Chloropeta	gracilirostris	VU	VU C1	Lake Mbuho National Park, Lake Albert, Nyamuro Swamp IBA, Lake Bunyonyi, Lake George (Muhokya Wetland), Lake Mutanda	East Africa, partly in Zambia, and 15% pop in Uganda	Payprus, & reed swamps on the lake shores	Habitat degradation	Decline inferred from habitat loss	Partial - range includes but not limited to PA's	Nature Uganda proposed survey in 2015	Globally declining due to rate of papyrus and wetland encroachment.
Karamoja Apalis	SYLVIIDAE	Apalis	karamojae	VU	EN C2a(i)	Karamoja sub-region, Kidepo Valley National Park	<50% Uganda and Tanzania, possibly Kenya	Whistling thorns/acacia woodland	Burning, overgrazing, habitat conversion	Decline	Partial - range includes but not limited to PA's	Establish monitoring to ascertain status and conservation programme based on results	Few records, but 2011, 9 pairs recorded in Iruri (1 pair breeding), 2015 only 1 pair seen. Believed declining throughout range due to loss Acacia woodland. 6-15,000 estimated globally but with Tanzania estimates of up to 1500, total numbers are likely to be far smaller than estimated. Could be CR
Cassin's Grey Flycatcher	MUSCICAPIDAE	Muscicapa	cassini	LC	LC	Kalinzu-Maramagambo Forest Reserve, Budongo Forest Reserve, Bugoma Forest Reserve, Rwenzori Mountain National Park (lower forest slopes), Bwindi Impenetrable National Park	Guineo-Congolian Region						Recent records including breeding records in Kibale Forest
Chapin's Flycatcher	MUSCICAPIDAE	Muscicapa	lendu	VU	EN C2a(i)	Bwindi Impenetrable National Park	Eastern Africa to DRC	Intact montane forest above 1500m	Forest degradation	Unknown	Occurs within National Park	Assess status and potential AOO	More commonly identified and now 20 known records from Bwindi (Buhoma), potentially Mgahinga or Echuya?
Yellow-bellied Wattle-eye	PLATYTEIRIDAE	Dyphorophya	concreta	LC	VU B2ab(iii)	Bwindi Impenetrable National Park, Kasyoha-Kitomi Forest Reserve, Kalinzu-Maramagambo Forest Reserve	Mainly West Africa, also Albertine Rift, Kenya	Medium altitude forest undergrowth of closed canopy forest	Habitat degradation	Decline	Occurs within PA's	Study current status and AOO	No recent records in last 20 years. Global population may be stable
Rwenzori Batis	PLATYTEIRIDAE	Batis	diops	LC	LC	Rwenzori Mountain National Park, Bwindi Impenetrable National Park, Mgahinga National Park, Echuya Forest Reserve	Albertine Rift endemic. 10% Uganda	montane forest above 1400m					Reasonably common throughout global range
Pygmy Batis	PLATYTEIRIDAE	Batis	perkeo	LC	DD	Kidepo Valley National Park, Mt. Moroto (1963)	Kenya, Somalia, Ethiopia. <1% Uganda	Semi-arid acacia bushland	Unknown	Unknown	Occurs within PA's	Establish status	Recent survey of Mt Moroto did not encounter this species. Check if seen in Kidepo
Ituri Batis	PLATYTEIRIDAE	Batis	ituriensis	LC	VU B2ab(iii)	Semliki National Park, Budongo Forest Reserve (Busingiro)	DRC, with 15% Uganda	lowland tropical forest	Habitat degradation and loss	Inferred decline	Partial - range includes but not limited to PA's	Requires improved protection of forests and deliniation of AOO	Area of Occupancy may be less than presumed 700km2 which would potentially change this listing.
Grey-chested Babbler, Grey-chested Illadopsis	TIMALIIDAE	Kakamega	poliothorax	LC	VU B2ab(iii)	Bwindi Impenetrable National Park, Rwenzori Mt National Park, Mt Elgon National Park, Mgahinga National Park, Echuya Forest Reserve	Mainly Albertine Rift with small isolated populations in Kenya and Nigeria/Cameroon border. <10% Uganda	1500-2400m in thick undergrowth	Deforestation	Presumed decline	Occurs within PA's	Better deliniation of AOO's	Recent records Fort Portal, Bwindi, Rwenzori. Mt Elgon an old record - presumed AOO as less than 1000km2



**Proposed National Redlist for Uganda: Evaluated Bird Species**

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
Stripe-breasted Tit	PARIDAE	Parus	fasciiventer	LC	NT	Bwindi Impenetrable National Park, Mgahinga National Park, Echuya Forest Reserve	Albertine Rift endemic, 20-30% Uganda	Sub-tropical - tropical moist montane forest	Habitat degradation	Unknown	Occurs within PA's		Low numbers. Believed to be declining throughout global range
Spotted Treecreeper	SALPORNITHIDAE	Salpornis	spilonota	LC	DD	West Nile Region, Mt Elgon	Patchily distributed throughout Sub-saharan Africa and India	Intact forest Mt Elgon, flat-topped Acacia West Nile	Habitat degradation and fragmentation	Presumed decline	Partial - range includes but not limited to PA's	Establish status	No records in last 50 years. Never common. Two races with distinct geographical and habitat preferences. Believed to be declining throughout global range
Blue-headed Sunbird	NECTARINIIDAE	Cyanomitra	alinae	LC	LC	Rwenzori Mountain National Park, Bwindi Impenetrable National Park, Mgahinga National Park, Echuya Forest Reserve	Albertine Rift endemic. < 30% Uganda	Medium-high altitude forest					Common throughout global range
Golden-winged Sunbird	NECTARINIIDAE	Nectarinia	reichenowi	LC	VU B2ab(ii)	Mt Elgon National Park	Uganda, DRC, Rwanda, Burundi, Kenya, Tanzania	Forest edge and bamboo up to 3300m	Deforestation and degradation.	Suspected decline	Occurs within National Park	Enforce protection of Mt Elgon Forest	Record listed from Kampala/Lake Victoria may be suspect. Mt Elgon area degraded and habitat could be less than 500km <sup>2</sup> ? Birdlife cites Uganda as major part of range and with numbers stable so this may not be correct.
Red-tufted Sunbird, Scarlet-tufted Malachite Sunbird	NECTARINIIDAE	Nectarinia	johnstoni	LC	VU B2ac(iv)	Rwenzori Mt National Park, Mgahinga National Park	Albertine Rift, Kenya, Tanzania, Malawi. 10-20% Uganda	Afro-alpine moorland, also heathland and montane forest edge	Climate change	Unknown	Occurs within PA's		Very restricted range in few locations in Albertine Rift, Kenya, Tanzania and Malawi, although sometimes extremely common
Greater Double-collared Sunbird, Rwenzori Double-collared Sunbird	NECTARINIIDAE	Cinnyris	afer	NA	VU D2	Rwenzori Mt National Park, Mgahinga National Park, Echuya Forest Reserve	C.a. Stuhlmanni endemic to Albertine rift mountains. C. afer has disjunct populations in Namibia and South Africa.	2100 - 3700m abundant just above bamboo zone in tree heaths	Habitat degradation	Unknown	Occurs within National Parks		Very restricted habitat and range in Uganda but not uncommon. C. stuhlmanni now considered a sub-species of Cinnyrus afer.
Fiery-breasted Bush Shrike	MALACONOTIDAE	Malaconotus	cruentus	LC	DD	Semliki National Park	West-Central Africa	Intact lowland forest	Habitat degradation and fragmentation	Presumed decline	Occurs within National Park	Establish status	Only known from Semliki - 1st recorded 1957, subsequently 1966, no records since. May be regionally extinct and declining throughout range
Lagden's Bush Shrike	MALACONOTIDAE	Malaconotus	lagdeni	NT	VU D2	Bwindi Impenetrable National Park, Rwenzori Mt. National Park	West Africa with small Albertine Rift population	Montane forest	Forest clearance	Presumed stable	Occurs within National Park		Recent observations suggest may be more common than previously thought. West Africa population is in decline due to continuing forest clearance
Luehder's Bush Shrike	MALACONOTIDAE	Laniarius	luehderi	LC	LC	Bwindi Impenetrable National Park, Mount Elgon National Park, Rwenzori Mountain National Park, Imatong Mountains, Agoro-Agu Forest Reserve, Bwamba (historical record, Semliki National Park), Mabira Forest Reserve	West Africa and Central-East Africa (DRC, Rwanda, Burundi, Uganda, Tanzania, Kenya), possibly up to 50% Uganda	Forest edge, adaptable	Possible fragmentation of habitat	Presumed stable	Occurs within PA's		Taxonomy uncertain as to whether L. brauni and L. amboimensis are separate species or sub-species
Papyrus Gonolek	MALACONOTIDAE	Laniarius	mufumbiri	NT	VU B1ab(iii)	Murchison Falls National Park, Queen Elizabeth National Park, Bwindi Impenetrable National Park, Lake Victoria, Lake Albert, River Nile, Semliki Valley	Rwanda, TZ. Possibly 90% Uganda	Papyrus swamp endemic	Habitat degradation, drainage and burning	Decline	Partial - range includes but not limited to PAs	Monitor status and improve protection of wetlands	Believed to be declining moderately rapidly throughout range (Uganda, Kenya, TZ and Rwanda). Higher status desirable but numbers and range in Uganda still reasonable. Requires estimates of local rate of decline to uplist.
Red-billed Oxpecker	BUPHAGIDAE	Buphagus	erythrorhynchus	LC	VU C1	Murchison Falls National Park, Kidepo Valley National Park	Eastern & southern Africa, <1% Pop in Uganda	savanna woodlands	Reduction in prey due to acaricide spray in cattle rearing areas	Decline inferred in reduction in prey due to intensive use of acaricides	Occurs within National Parks	Strengthen PA protection so buffaloes, antelopes and zebra can increase in numbers	



**Proposed National Redlist for Uganda: Evaluated Bird Species**

Common name	FAMILY	GENUS	SPECIES	Global Redlist status	National Redlist	Sites	Est. % global population in Uganda	Habitat preference	Threats to species	Population trend in Uganda	Current conservation measures	Recommended measures	Rationale for criteria/notes
Strange Weaver	PLOCEIDAE	Ploceus	alienus	LC	LC	Bwindi Impenetrable National Park, Rwenzori Mountain National Park, Echuya Forest Reserve	Albertine Rift endemic. 10-20% Uganda	Medium-high altitude forest					Only found in southern forests of Albertine Rift, common throughout its global range
Fox's Weaver	PLOCEIDAE	Ploceus	spekeoides	NT	EN B2ab(iii,v)	Lake Kyoga system, including Getome Swamp, Lake Bisina IBA, Lake Opeto IBA	100% Uganda	Lakeside grasslands with shrubs	Overgrazing, burning	Decline	Grant for surveys - currently underway with Nature Uganda	Establish monitoring programme to ascertain status. Enforce protection of wetlands	No record since 2009, EN status but could be CR - pending results of current study
Marsh Widowbird, Hartlaub's Marsh Widowbird	PLOCEIDAE	Euplectes	hartlaubi	LC	VU C1	Lake Nabugabu and other satellite lakes in Lake Victoria Basin	Main range Angola, Zambia, with scattered populations in Central and East Africa	Swamps	Habitat degradation and drainage	Decline	None	Establish protection of key wetlands	Few recent records in areas formerly relatively common points to estimated serious decline
Shelley's Crimson-wing	ESTRILIDAE	Cryptospiza	shelleyi	VU	EN D	Rwenzori Mountains National Park, Bwindi Impenetrable National Park	Albertine Rift endemic. 10% Uganda	Montane Bamboo forest habitat	Habitat degradation	Unknown	Occurs within National Park	Increased law enforcement, surveys of suitable habitat to understand opportunities for gain	Surveys within Uganda (WCS 2007) have shown it to be much rarer than previously thought. Global estimate of 2500 - 10,000 may therefore be high. Believed to be declining throughout range due to habitat loss and degradation.
Purple Grenadier	ESTRILIDAE	Uraeginthus	ianthinogaster	LC	NT	Kidepo Valley National Park, Karamoja sub-region (Moroto),	East Africa. <2% Uganda	Dry acacia	Habitat conversion, grazing	Unknown	Partial - range includes but not limited to PA's		Very local and very rarely recorded in dry acacia and thorn bush. Under 10 records in Uganda
Cut-throat, Cut-throat finch	ESTRILIDAE	Amadina	fasciata	LC	NT	Murchison Falls National Park, Kidepo Valley National Park, Karamoja sub-region (Moroto)	Scattered populations Sahel and Eastern Africa	Dry acacia	Habitat conversion, grazing	Unknown	Partial - range includes but not limited to PA's		Very local and very rarely recorded in dry acacia and thorn bush. Under 10 records in Uganda. Locally common and believed stable globally
Steel-blue Whydah	VIDUIDAE	Vidua	hypocherina	LC	DD	Karamoja sub-region, Kidepo Valley National Park	North-east African species on edge of its range	Dry bushland	Agriculture, overgrazing	Unknown	Partial - range includes but not limited to PA's	Establish status and current AOO	Very uncommon species of dry bush country, recently seen in Karamoja
Straw-tailed Whydah	VIDUIDAE	Vidua	fischeri	LC	DD	Karamoja sub-region, Kidepo Valley National Park	North-east African species on edge of its range	Dry bushland	Agriculture, overgrazing	Unknown	Partial - range includes but not limited to PA's	Establish status	More common in Kenya/Tanzania, uncommon species, recently seen in Karamoja

Note: selected elements of the comprehensive listings available with USAID/Uganda. Assessors: Hamlet Mugabe [hmugabe@wcs.org](mailto:hmugabe@wcs.org); Sarah Prinsloo [sprinsloo@wcs.org](mailto:sprinsloo@wcs.org); Dr. Andrew Plumtre [aplumtre@wcs.org](mailto:aplumtre@wcs.org); Prof. Derek Pomeroy [derek@infocom.co.ug](mailto:derek@infocom.co.ug); Achilles Byaruhanga [achilles.byaruhanga@natureuganda.org](mailto:achilles.byaruhanga@natureuganda.org); Roger Skeen [skeenbo@yahoo.co.uk](mailto:skeenbo@yahoo.co.uk); Richard Ssemmanda [richard.ssemmanda@total.com](mailto:richard.ssemmanda@total.com); Herbert Tushabe [htushabe@gmail.com](mailto:htushabe@gmail.com); Raymond Katebaka [raymond.katebaka@gmail.com](mailto:raymond.katebaka@gmail.com). Reviewers: Isaiah Owiunzi [isaiah\\_owiunzi@yahoo.co.uk](mailto:isaiah_owiunzi@yahoo.co.uk); Lincoln Fishpool [Lincoln.Fishpool@birdlife.org](mailto:Lincoln.Fishpool@birdlife.org)

U.S. Agency for International Development  
1300 Pennsylvania Avenue, NW  
Washington, DC 20523  
Tel: (202) 712-0000  
Fax: (202) 216-3524  
[www.usaid.gov](http://www.usaid.gov)