

Larger than elephants

Inputs for the design of an EU strategic
approach to Wildlife Conservation in Africa

Volume 5: West Africa
DRAFT DOCUMENT

WEST AFRICA



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ACRONYMS

ABS	Access and Benefits Sharing
ACP	Africa Caribbean Pacific
ADB - AfDB	African Development Bank
AFD	Agence Française de Développement
AfESG	African Elephant Specialist Group's statement of 2003
ANP	Africa Parks Network
AU	African Union
AWF	African Wildlife Foundation
AZE	Alliance for Zero Extinction
BIOPAMA	Biodiversity and Protected Areas Management Program
CBD	Convention on Biological Diversity
CBNRM	Community Based Natural Resource Management
CENAGREF	Centre National de Gestion des Réserves de Faune
CI	Conservation International
CITES	Convention on International Trade in Endangered Species
CoP	Conference of the Parties
DNA	Deoxyribonucleic acid
DOPA	Digital Observatory for Protected Areas
EA	Eastern Africa
EAGLE	Eco Activists for Governance and Law Enforcement
EC	European Commission
ECOFAC	Programme Régional de Conservation et Utilisation Rationnelle des Ecosystèmes Forestiers d'Afrique Centrale
ECOWAS	Economic Community of West African States
EDF	European Development Fund
EFG	École de Faune of Garoua
ENEF	École Nationale des Eaux et Forêts
ERAIFT	École Régionale d'Aménagement intégré des Forêts et Territoires tropicaux
ETIS	Elephant Trade Information System
EU	European Union
FAO	Food and Agriculture Organisation
FEM	Fonds pour l'Environnement Mondial
FFEM	Fonds Français pour l'Environnement Mondial
FLEGT	Forest Law Enforcement, Governance and Trade
FZS	Frankfurt Zoological Society
GDP	Gross Domestic Product
GEF	Global Environment Fund
GIZ	Deutsche gesellschaft für technische Zusammenarbeit (German technical cooperation)
GRASP	Great Apes Survival Partnership
HEC	Human Elephant Conflict
HWC	Human Wildlife Conflict
IBA	Important Bird Area
IBRD	International Bank for Reconstruction and Development [UN]
ICCWC	International Consortium on Combating Wildlife Crime
IDA	International Development Association
IUCN	International Union for Conservation of Nature
IUCN-PAPACO	Programme Aires Protégées pour l'Afrique du Centre et de l'Ouest
KCA	Key Conservation Area
KfW	Kreditanstalt für Wiederaufbau (German financial cooperation)
KLC	Key Landscape for Conservation

LAGA	Last Great Ape Organisation
LAGA	Last Great Ape Alliance
LEM	Law Enforcement Monitoring
MAB/UNESCO	Man and the Biosphere Program
MIKES	Minimising the Illegal Killing of Elephants and other Endangered Species
MIST	Management Information System
MoU	Memorandum of Understanding
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
NP	National Park
NRM	Natural Resource Management
NTFP	Non Timber Forest Products
OFAC	Central African Forest Observatory
OFINAP	Office national des aires protégées of Burkina Faso
PA	Protected Area
PES	Payment for Ecological Services
PES	Payments for Ecosystem Services
PFM	Participatory Forest Management
PHVA	Population and Habitat Viability Assessment
PPP	Public Private Partnership
PVA	Population Viability Analysis
Ramsar	The Ramsar Convention is an international treaty for the conservation and sustainable utilization of wetlands
REDD+	Reduced Emissions from Deforestation and Forest Degradation
RRIS	Regional Reference Information System
SMART	Self-Monitoring, Analysis and Reporting Technology
SSC	Species Survival Commission
STEWARD	Sustainable and Thriving Environments for West African Regional Development
TEEB	The Economics of Ecosystems & Biodiversity
TFCA	Trans-Frontier Conservation Area
ToR	Terms of Reference
TRAFFIC	The wildlife trade monitoring network
UICN	Union Internationale pour la Conservation de la Nature
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Education, Science and Culture Organisation
UNODC	United Nations Office on Drugs and Crime
USAID	United States Agency for International Development
USFWS	United States Fish and Wildlife Service
WA	West Africa
WAEMU	West Africa Economy and Monetary Union
WAMPAN	West Africa Marine Protected Areas Network
WAPAN	West Africa Protected Areas Network
WAPOK	Savannas KLC between Benin, Burkina Faso, Niger and Togo
WAZA	World Association of Zoos and Aquariums
WCMC	World Database of Protected Areas
WCS	Wildlife Conservation Society
WHS-UNESCO	World Heritage Site
WWF	Worldwide Fund for Nature

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0. RATIONALE

The impetus for developing the strategic approach proposed in these volumes has come from the growing global awareness of a wildlife crisis in Africa. Although the much publicised plight of the African elephant and rhino has placed the issue at the forefront of international debate, conservation practitioners working on the ground in Africa have known for a long time that the wildlife crisis is by no means limited to a few iconic African wildlife species which are only the visible portion of an iceberg that hides a steady erosion of wildlife over a wide range of species in all biomes. The scale of the wildlife crisis is immense and one of the main aims of this document is to underline (a) just how much needs to be done and why, (b) what are likely to be the most realistic and effective strategic priorities for saving Africa's wildlife heritage, given the rate of human population growth and associated habitat loss. It is also hoped that the document will serve as a way of federating the different wildlife conservation actors, both within and outside Africa, around a balanced series of common themes.

One of the key points that emerges from the following is that the pressure on land and natural resources in Africa has increased conspicuously in recent decades, and is set to increase considerably more as a result of ongoing demographic and economic trends; more than ever before, Protected Areas have to be at the heart of any strategic approach to wildlife conservation as these are the areas where the most intact assemblages of Africa's wildlife are found. A second key point is that African people living in wildlife-rich areas need to have tangible benefits in the preservation of Africa's wildlife if they are (a) to accept the costs of living with it and (b) be able to continue using it sustainably. Thirdly, efforts to tackle the international illegal trade require concerted actions to stop the killing, stop the trafficking and stop the demand for wildlife and forest products. Fourthly, good quality and up-to-date information is essential in order to inform the choice of strategic options and monitor outcomes. Lastly, all of the above will require a whole raft of institutional, policy and legal improvements or changes to occur in parallel.

Combining the above considerations brings us to an overall objective, or desired outcome, for the strategic approach to wildlife conservation:

A full suite of viable populations of the unique wildlife heritage of Sub-Saharan Africa maintained in healthy, functioning and resilient ecosystems supporting livelihoods and human development.

Thus the strategic approach developed herein is primarily targeted at the conservation of large functioning ecosystems or landscapes supporting key African wildlife populations. It contributes to wider goals of biodiversity conservation by, for example, protecting many small areas of outstanding importance to particular threatened taxa where those small areas fall within larger conservation landscapes. A secondary tactic supporting wider biodiversity goals is to make conservation funds available to agencies and projects protecting small important sites that cannot be contained in the large key landscapes identified.

The Strategic Approach to Wildlife Conservation in Africa is presented in six volumes as follows:

- Volume 1: Synopsis**
- Volume 2: Southern Africa**
- Volume 3: Eastern Africa**
- Volume 4: Central Africa**
- Volume 5: Western Africa**
- Volume 6: Additional Sections – Elephants, Rhinos, Trade, Madagascar, Birds, Other Wildlife**

The first five volumes are each arranged according to six chapters (following an Executive Summary): 0. Rationale; 1. Special Features of the Region; 2. Conservation Challenges and Issues; 3. Ongoing Conservation Efforts; 4. Lessons Learnt and Promising Approaches; and 5. Indicative Conservation Actions. A somewhat different format is found in Volume 6 which begins with three chapters (Elephants, Rhinos, Trade) that relate to the wildlife crises currently affecting elephants, rhinos, numerous 'bushmeat' species including many rare forest specialist species, and various plants and trees that have market value. These three chapters contain relevant background information and strategic approaches aimed at stopping the killing, the trafficking and the demand. There is a separate chapter on Madagascar because of its unique conservation status and geographic isolation. A fifth chapter introduces priorities for bird conservation, highlighting the coordinated conservation of European-

African bird migrations. An annex provides additional information on various other wildlife groups (including fish, amphibians, insects, large carnivores and great apes) that warrant special mention.

We recognise that the wildlife crisis is not confined to the terrestrial environment and that marine ecosystems are also critically impacted by unsustainable harvesting. Furthermore, we are aware that issues relating to the impoverishment of the marine environment are as far reaching as those of the terrestrial environment. A separate, but linked, strategic approach is therefore required for marine ecosystems. Similarly a separate but linked strategic approach may be required for conservation of freshwater ecosystems which recognizes unique elements of the aquatic fauna. Some freshwater ecosystems are incorporated into this strategy, particularly those wetlands that have importance for water birds, or as terrestrial ecosystems in their own right (such as Okavango Delta, swamp forest areas in Central Africa, Rift Valley Lakes, the Sudd, Lake Chad, Senegal Delta and Inner Niger Delta), or have exceptional importance for biodiversity (Lakes Malawi and Tanganyika for example).

The European Union wishes to assist in building an inclusive strategic approach to the conservation of African wildlife that involves all political and organisational stakeholders working for the benefit of Africa, its wildlife heritage and its peoples. This document may be viewed as a first step in the process of building a consensus, after which the various strategic elements proposed will need to be translated into action through a series of programmes and projects for which detailed results and indicators will have to be developed and rigorous performance monitoring and accountability measures applied. Through cooperation we trust that the long-term future of African wildlife can be secured and that this will be done in such a way as to provide greatest benefits to the nations and peoples of Africa, and not least to the local people who live alongside and within some of the most spectacular wild ecosystems on the planet. The natural heritage of Africa greatly enriches the global natural heritage and we hope this strategic approach to its conservation will encourage others to adopt compatible strategic approaches in other regions.

EXECUTIVE SUMMARY

Aspects of WA biodiversity

The following aspects characterize the biodiversity of West Africa (WA):

- Wide diversity of habitats and species;
- Strong degradation;
- Greatest richness of biodiversity in lowland and mountain forests (the Guinea forest in WA contains half the mammal species on the African continent);
- Presence of some of the largest and most beautiful antelopes in the world;
- A pattern of extinction of mammals in the wild that is progressively higher moving from the coastal and forest biomes to the deserts (including the desert PAs);
- Progressive decline in the representation of biomes in PAs on moving from desert towards the forest and coastal areas.

The current interventions for conservation in WA do not ensure the protection of wildlife or its biodiversity heritage. Those interventions that assist in-situ conservation are highly concentrated in the savanna areas. Interventions in favour of ex-situ conservation do not protect some of the key endemic mammals at risk of extinction (e.g. WA lion). Survival of some key species (e.g. Oryx) requires the adoption of a mixed strategy of in-situ and ex-situ conservation due to poor genetic heritage of the mammals supposedly extinct in nature and existing only in captivity. The effects of climate change and the important development of industrialization in the southern countries in WA are causing significant in-migration of human populations. The effects of these phenomena are higher pressure and consequently greater degradation of coastal and lowland forest ecosystems which are the most threatened ecotypes in the region. The current fragility of biodiversity and the significant threats on the overall biodiversity heritage of Western Africa require conservation interventions that are highly specific to this region – this is in addition to the more general strategic approach outlined in volume 1.

For the strategic approach to wildlife conservation in WA, there is specific need for the following:

- *In situ* support for conservation which includes: (1) Specific strategies and actions for the four ecotypes: (a) Deserts, (b) Savannas, (c) Forests and (d) Mangroves/Coastal areas; (2) Special analysis for species and habitats that are highly threatened with extinction; and (3) Specific training in wildlife protection on the ground (see sections 5.1.2, 5.1.8, 5.1.9).
- Strengthening of management capacity in wildlife conservation with a focus on regional coordination: (1) Institutional support to raise capacity for wildlife conservation and strengthen coordination between countries of the region; and (2) Governance training for management authorities so that the landscape approach proposed by this strategic approach can be adopted (see sections 5.2.1, 5.2.5).

Organisation of the volume 5

The first chapter presents the key elements of the West African countries concerning: (i) development indicators, driving forces causing wildlife decline and the impacts of climate change; (ii) an overview of the wildlife in West Africa following an analysis by four major ecotypes (Deserts, Savannas, Forests and Mangroves/Coastal) including the coastal and marine PAs, the more threatened species and the risks of species disappearing; (iii) a quick analysis of two elements connected with long-term wildlife conservation: the need for regional institutional support and for conservation- capacity building in WA. The second chapter indicates the key direct threats and the key indirect threats to conservation in WA. The chapter presents analysis of:

- Four key direct threats to conservation: (i) availability of funds; (ii) institutional governance; (iii) illegal wildlife income and corruption and iv) weak planning, management, effectiveness and monitoring;
- Five key indirect threats to conservation: (i) population growth and poverty; (ii) fragmentation, reduction and isolation of PAs in the landscape; (iii) coup d'états, rebellions, civil unrest and religion fundamentalism, ebola crisis (epidemics/pandemics), and refugee crises; (iv) negative economic trends; (v) Policy and sectorial approaches.

The third chapter is a short presentation of the ongoing conservation effort organised for the four major ecotypes; Deserts, Savannas, Forests and Mangroves/Coastal. At present the ongoing conservation efforts are characterised by: (i) low funding for desert PAs with a strong involvement of NGOs, (ii) comparatively strong support in the savanna area; (iii) low funding for rainforest areas, with mixed interventions of government and NGOs; (iv) a small scale success story for the recovery of mangrove forests through a public-private partnership.

The fourth chapter looks quickly at negatives and positives lessons learnt and promising approaches. The success of the promising approaches depends on the functional integration of three strategies: (A) consistent, uninterrupted interventions on the ground with specific strategic approach of intervention for each major ecotype but coordinated between them, (B) a decision support system based on the collection and organization of information on biodiversity and management effectiveness in collaboration with BIOPAMA (EU programme) and (C) shared decision-making at institutional and political levels.

The fifth chapter is the most developed and gives details about the two parallel processes, active and proactive, to try to establish or restore the fundamentals to a better wildlife conservation in West Africa. The active process has a focus on more feet on the ground to take action against key direct threats and for the protection of areas of high biodiversity, while the proactive process is an external support for better governance, monitoring and planning and against the key indirect threats on PAs.

The active process has five main activities: (1) Dissemination and analysis of the proposals about sites and priorities on conservation in WA; (2) Specific strategies and actions for the major ecotypes: Deserts, Savannas, Forests and Mangroves/Coastal; (3) Dismantling Wildlife traffic network; (4) Special analysis and (5) Wildlife protection training. The objectives of the active process are: (i) to balance the interventions between the four major ecotypes; (ii) to save threatened species from extinction; (iii) preservation of critical habitats (e.g. wetlands, Mount Nimba, mangroves); (iv) to improve management effectiveness of national and transborder parks; (v) to promote the initiatives of landscapes on conservation for maintaining connections between the blocks of PAs and (vi) to ensure a better representation of the realities of wildlife in WA.

The proactive process attempts, by creating an “Institutional Support and coordination” under WAEMU, to coordinate and promote: (1) Monitoring and Planning; (2) Communication; (3) Biological research; (4) Management-Governance training. The objectives of the proactive process are: (i) improving the availability and proper use of resources; (ii) ensuring a shared and harmonized implementation between countries; (iii) developing a stronger balance of conservation initiatives in the macro-ecotypes of West Africa; (v) greater attention about the specificities of conservation at national, regional and interregional level (e.g. highly threatened species, wetlands at risk of extinction, mangrove ecosystems). At present there is no organisation that provides the required institutional, technical and scientific capacities in WA; therefore this document recommends the combination of existing institutions and organisation with adequate support to establish a unit to implement the proposed strategic approach.

The annexes present basic information that will support the development of a strategic approach on conservation of biodiversity in WA: (i) key, threatened, rare and high value species; (ii) data of the main projects on conservation in WA and (iii) miscellaneous data about WA.

1. SPECIAL FEATURES OF WEST AFRICA

1.1 COUNTRIES OF WEST AFRICA

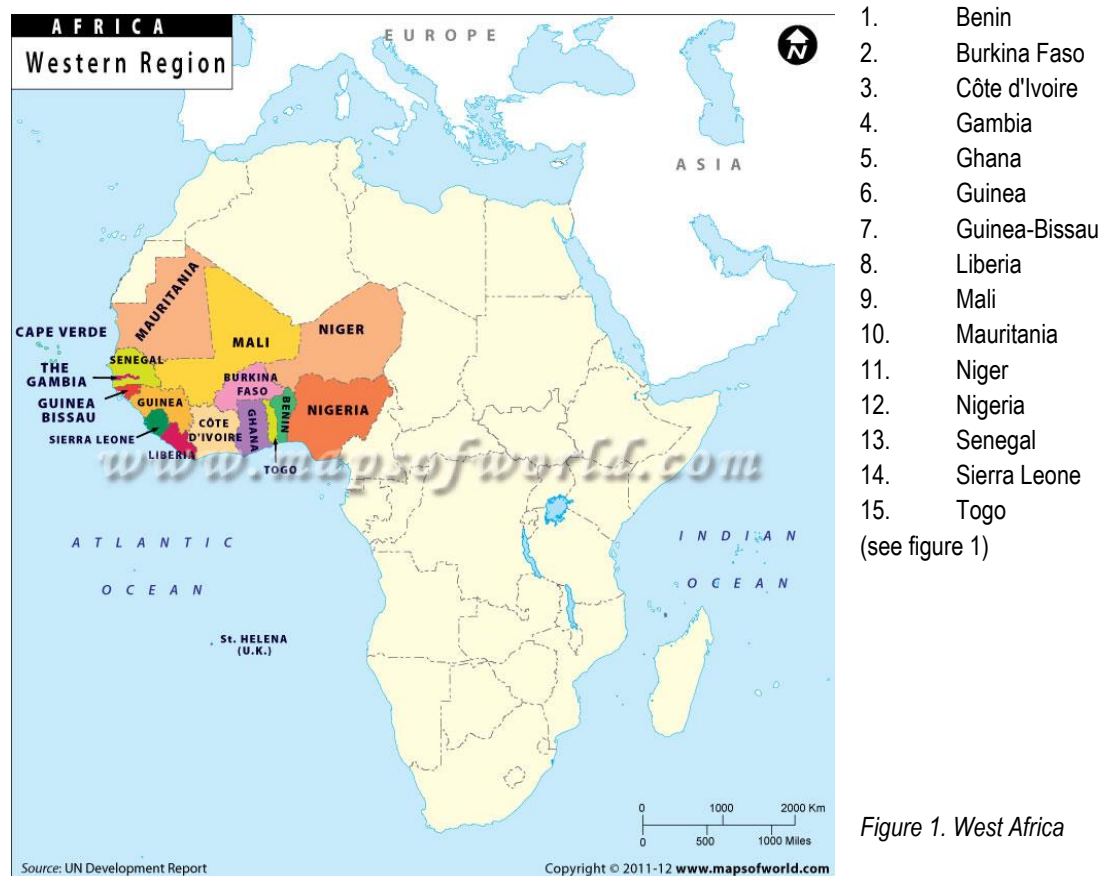


Figure 1. West Africa

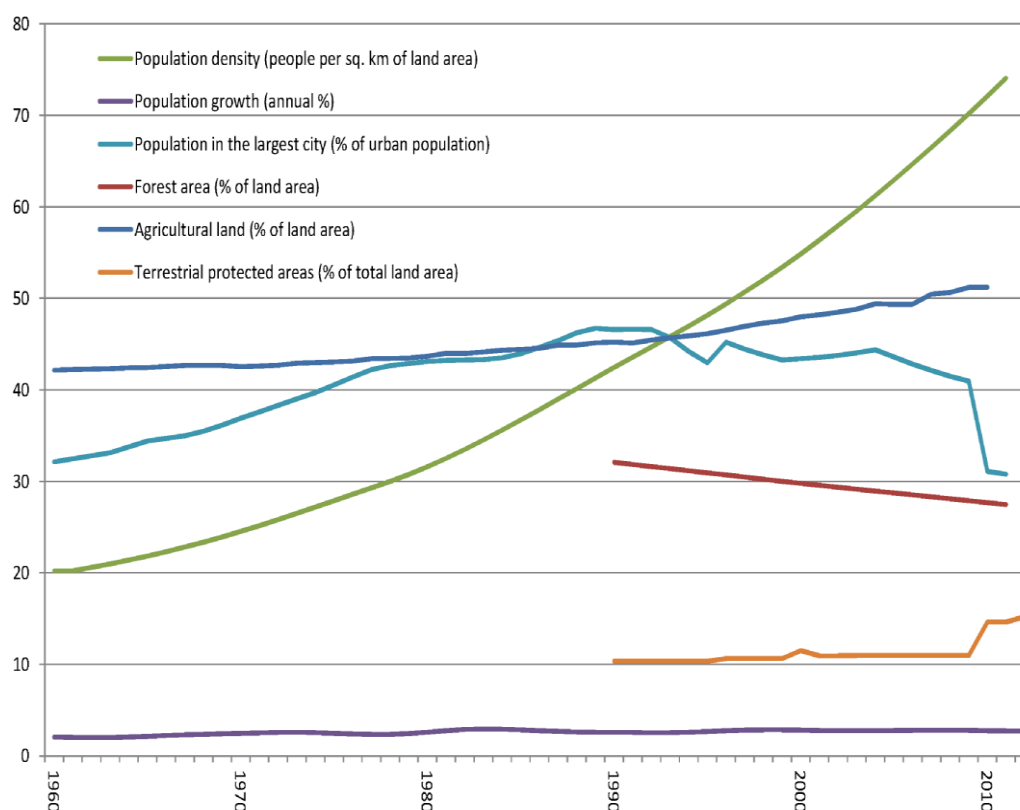
Cape Verde was not considered in the report because there are no protected areas (PA) in the country, but it was associated with this strategic approach in a few specific analyses.

1.1.1 Development indicators

The countries of West Africa have a population of 340 million and about 60% of the inhabitants live in rural areas. The average yearly income for each person in West Africa is \$800 (2011). This compares with an average yearly income for each person in Sub-Saharan Africa of \$1.500. The region's economic growth has averaged only 2.9% during the past three years, in contrast with what was the best GDP growth for Africa in the past, while its population has been growing by 2.8 – 2.9% a year. It is estimated that economic growth of about 6-7% a year would be required to meet the goal of cutting extreme poverty in half by 2020 (see table 1 and figures 2 and 3).

Table 1. Population, Annual Growth (%) and Estimated doubling time of population of West Africa

Country	July 1, 2013 projection	Average relative annual growth (%)	Estimated doubling time (Years)
Benin	9 742 000	3,24	22
Burkina Faso	17 323 000	3,28	21
Gambia	1 794 000	2,75	26
Ghana	26 441 000	2,56	27
Guinea	11 861 000	3,09	23
Guinea-Bissau	1 699 000	2,60	27
Ivory Coast	23 919 000	3,09	23
Liberia	3 881 000	2,10	33
Mali	16 678 000	3,29	21
Mauritania	3 461 000	2,58	27
Niger	17 493 000	3,85	18
Nigeria	177 096 000	3,24	22
Senegal	13 567 000	3,06	23
Sierra Leone	5 823 000	1,84	38
Togo	6 675 000	2,88	24
Total	337 453 000	2,90	25



Increasing population density and agricultural land with decreasing forest areas and formally maintained protected areas (source World Bank, Africa Development Indicators, specific elaboration)

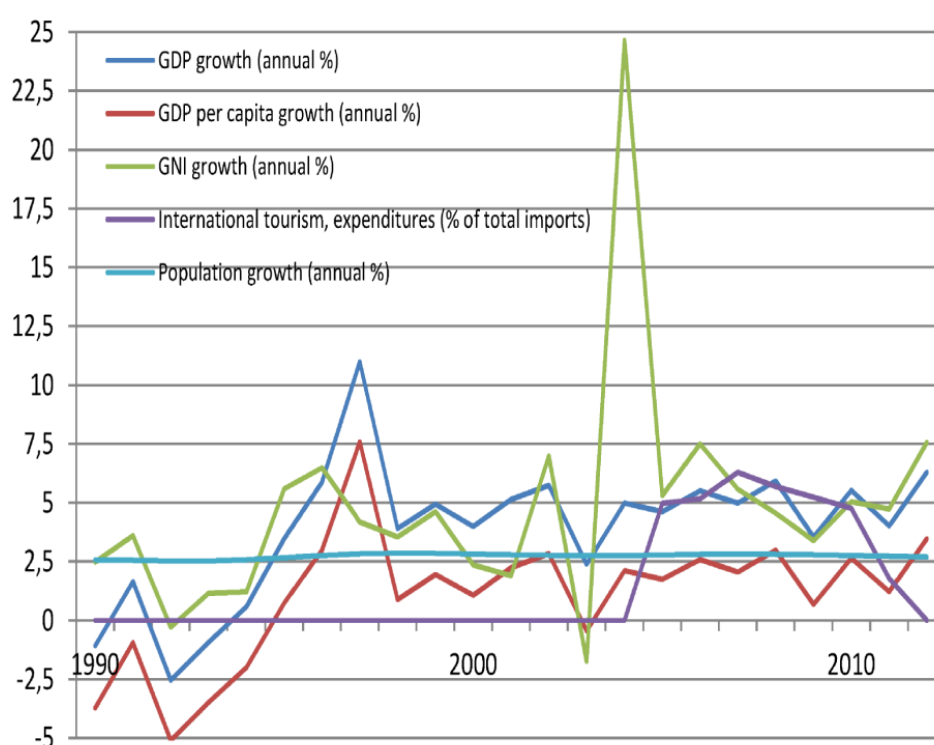
Figure 2. West Africa, Development indicators (1), 1960-2012

1.1.2 Conflict

Over the past 15 years, nine of the 15 members of the Economic Community of West African States (ECOWAS - Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Senegal, Sierra Leone and Togo) have experienced conflict ranging from high intensity civil wars to violence during elections. One of the most common reasons advanced for the prevalence of conflict is weak governance. The area accounts for more than 70% of military coups in Africa. There is a high degree of illicit trade in diamonds, timber and wildlife which can be directly related to the conflict. In the last years, the conflicts in Cote d'Ivoire and Mali have been particularly damaging for the region and also for biodiversity in the country. Maintaining peace in the region is seen as a prerequisite for improving its development outcomes. In 1999, it was estimated that \$800 million that could have been used for development was instead diverted into conflicts.

1.1.3 Food crisis

Underdevelopment, low rainfall, climate change, coup d'état, rebellion, civil and religious fundamentalism, epidemics (EBOLA) and unrest continue to disrupt local and cross-border staple food and livestock markets. Consequently the forced migrations, poverty, declining food stocks and rising food prices are all key factors that are contributing toward a chronic food crisis in Western Africa. Fifteen million people across Western Africa are directly or periodically affected by the food crisis. A higher-than-average staple food price is causing an increase in the illness rate in Western Africa as many people are becoming severely malnourished.



Note the insufficient reduction in population growth, increasing GDP and GNI growth, but a recent decline in tourism (source World Bank, Africa Development Indicators, specific elaboration)

Figure 3. West Africa Development indicators (2), 1990-2012

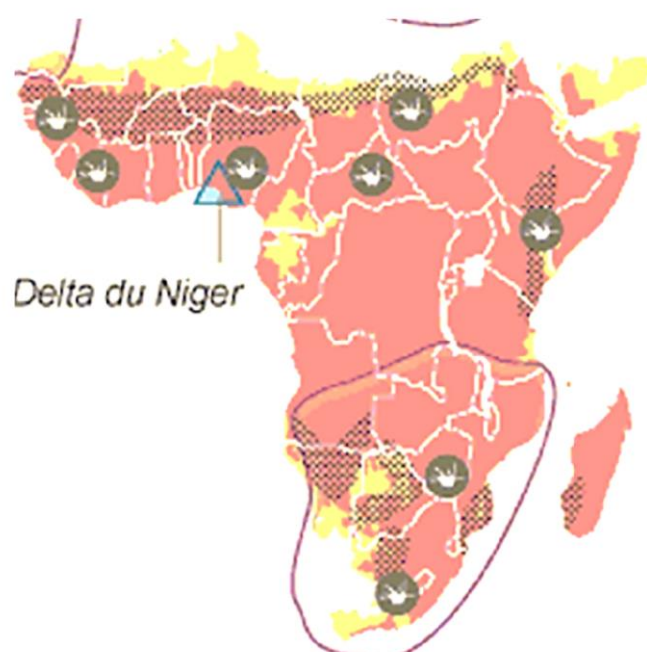
1.1.4 West Africa and the Millennium Development Goals






West Africa is lagging behind in its efforts to meet the Millennium Development Goals:

- Over 55% of West Africans live on less than \$1 / day;
- Life expectancy at birth is only 46 years;
- Secondary school enrolment is at 20 %;
- 42% of adults are illiterate;
- Malnutrition affects 29% of children under the age of five.

(Source World Bank, Africa Development Indicators)

1.1.5 Climate change



Area of climate change risk		Multiple and difficult effects to measure	
	High risk areas		Degradation of agricultural systems
	Large deltas threatened		Decreased precipitation
			Desertification

Source: Atlas compilation of tomorrow's world, La Vie/Le Monde, source UNEP, Atlas of future world, Robert Laffont 2008; Maplecroft, Climate Change Vulnerability Index 2013

Figure 4. Illustrating Climate Change Vulnerability in West Africa

For WA, the most recent estimates of the effects of climate change show:

- High risk for the desert and savanna areas of the Sahelian zone;
- Increasing desertification of Sahelian Acacia savanna ecotypes and the West Sudanian savanna;
- Probable degradation of agricultural systems for: (1) the south-east of Nigeria, (2) the cross-border area between Guinea, Cote d'Ivoire, Liberia and Sierra Leone, (3) the cross-border area between Senegal, Gambia, Guinea Bissau and Guinea Conakry;
- Increased threat of floods on the Niger Delta (see figure 4).

1.1.6 Conclusions

West Africa has several negative aspects that are acting as constraints on conservation actions: (1) high political instability and security risks; (2) high population growth (featuring high concentrations in big cities but a reduction in the urban population) with an estimated doubling time of the population over the next 25 years; (3) economy growing slowly in relation to the objectives of the Millennium; (4) significant environmental fragility due to the pressures of deforestation, cyclical periods of drought, climate change; (5) constant food crises which increase the tendency of migration to coastal areas, and reduce the effectiveness of conservation in savanna and coastal areas because of the higher pressures on natural resources, pressure on land, and economic activities; (6) the high risks arising from climate change; (7) an insufficient awareness of wildlife by civil society.

1.2 OVERVIEW OF ECOLOGICAL CHARACTERISTICS OF THE WEST AFRICAN REGION

West Africa has high biodiversity value because of the wide range of ecosystems: deserts, savannas, forests, big rivers and floodplains, mountains, mangroves and seas. Despite greatly reduced wildlife populations, the region still has high conservation value¹ as: (a) large antelopes which can be considered among the most beautiful in Africa, such as the Giant eland, roan antelope, major (or western) hartebeest, addax, and also some spectacular small antelopes such as Zebra duiker and Jentink's Duiker including a newly discovered (2009) species of duiker (*Philantomba walteri*); (b) extensive and important terrestrial ecosystems, including the cross-border WAPOK complex of parks (W, Arly, Pendjari, Oti Monduri, Keran and hunting reserves of about 38,000 Km²) that host the largest elephant population in the region (with 20 to 60 elephants per 100 Km²)²; (c) many endemic and isolated populations of wildlife - giraffe (*G. c. peralta*), pygmy hippopotamus, manatee, lion, cheetah and African wild dog; (d) populations of two subspecies of chimpanzee and one highly threatened subspecies of gorilla; (e) high importance for migrating birds from Europe; (f) inland waters supporting a high diversity of aquatic species with high levels of endemism; (g) unique and critical habitat for the conservation of amphibians (e.g. Mount Nimba) which are the most endangered class of animals in the world.

1.2.1 Major Ecotypes

The WA region is analysed on the basis of four major ecological zones that correspond to the biomes and ecoregions adopted by the WWF. Due to the geopolitical area limitation, the biomes and some ecoregions of WA fall also in other regions of Africa. The major ecological zones (or ecotypes) of WA are (see table 2 and figure 5):

- **A – Deserts (Realms: Palearctic - Biome: Deserts and xeric shrubland).** The ecotypes of the desert area are: (1) Sahara Desert; (2) Atlantic coast; (3) South Saharan steppe and woodlands; (4) West Saharan montane xeric woodlands.
- **B – Savannas (Realms: Afrotropics - Biome: Tropical and subtropical grasslands, savannas, and shrublands).** The ecotypes of the savanna area are: (1) Sahelian Acacia savanna; (2) West Sudanian savanna; (3) Guinean forest-savanna mosaic; (4) Jos Plateau forest-grassland mosaic.
- **C – Forests (Realm: Afrotropics - Biome: Tropical and subtropical moist broadleaf Forests).** The ecotypes of the forest area are: (1) Guinean Montane Forests; (2) Western Guinean lowland forests; (3); Eastern Guinean forests; (4) Nigerian lowland forests; (5) Cameroonian Highlands forests; (6) Cross-Sanaga-Bioko coastal forests; (7) Niger Delta swamp forests; (8) Cross-Niger transition forests.
- **D – Mangroves/Coastal (Realm: Afrotropics - Biome: Mangroves).** The ecotypes of the mangrove area are: (1) Guinean Mangroves, and (2) Central African mangroves.

¹ The report analyzes only the terrestrial biodiversity

² Source: African Elephant Database (AED) / IUCN / SSC African Elephant Specialist Group (AfESG) - 1995 - 2005

Table 2. Major Ecotypes, formally protected areas and indicative conservation status in West Africa

	Biome	Ecotypes	Km²	% Formally protected	Conservation Status	Countries of other regions
Realms: Palearctic	Deserts and xeric shrubland	A. Deserts				
		Sahara Desert	4.619.260	1,8	Vulnerable	Algeria, Chad, Egypt, Libya, Sudan
		Atlantic coast	39.883	17,0	Relatively Intact	Morocco
		South Saharan steppe and woodlands	1.101.700	6,0	Vulnerable	Algeria, Chad, Sudan
		West Saharan montane xeric woodlands	258.100	41,5	Relatively intact	Algeria
Realms: Afrotropics	Tropical and subtropical grasslands, savannas, and shrublands	B. Savannas				
		Sahelian Acacia savanna	3.052.854	9,4	Vulnerable	Cameroon, Chad, Sudan, South Sudan, Eritrea
		West Sudanian savanna	1.638.306	5,1	Critical/Endangered	
		Guinean forest-savanna mosaic	673.600	9,7	Critical/Endangered	
	Montane Grasslands and Shrublands	Jos Plateau forest-grassland mosaic	13.208	0,0	Critical/Endangered	
	Tropical and subtropical moist broadleaf Forests	C. Forests				
		Guinean Montane Forests	31.078	9,2	Critical/Endangered	
		Western Guinean lowland forests	206.666	15,6	Critical/Endangered	
		Eastern Guinean forests	189.724	21,9	Critical/Endangered	
		Nigerian lowland forests	67.335	17,3	Critical/Endangered	
		Cameroonian Highlands forests	38.070	7,9	Critical/Endangered	Cameroon
		Cross-Sanaga-Bioko coastal forests	52.314	22,6	Vulnerable	Cameroon
		Niger Delta swamp forests	14.503	6,6	Critical/Endangered	
		Cross-Niger transition forests	20.718	2,6	Critical/Endangered	
	Mangroves	D. Mangroves/Coastal				
		Guinean Mangroves	22.790	11,3	Vulnerable	
		Central African mangroves	29.783	10,9	Critical/Endangered	Cameroon, Equatorial Guinea, Gabon

1.2.2 Conservation issues and challenges (key and threatened, rare and high value species)

1.2.2.1 Elephants

West Africa has lost more than 90% of the elephant population in the 20th century. There are little reliable data on the numbers of elephants in WA. Estimates indicate that elephant populations are small, isolated, and nearly two-thirds of them consist of little more than 100 elephants, with the exception of one population in the WAPOK complex (Oti-Mounduri and Keran in Togo home no elephants) which has a density of 0.58 elephant/Km² (CR 28%) (Bouché et al, 2013).

1.2.2.2 Sahelo-Saharan Antelopes

These vast arid lands contain relatively few, but highly charismatic and emblematic species. As result of the successive droughts during the 1980s and increasing human pressures, the Sahelo-Saharan antelopes are seriously threatened (Addax, Dama Gazelle and Darcas Gazelle) or even probably extinct (Oryx). The desert antelopes survive essentially through ex-situ conservation but their genetic heritage must be improved to ensure the survival of these species. In the future there should be carefully planned reintroductions, adapted to the specific needs of these highly mobile species, into an effectively managed network of protected areas.

1.2.2.3 Primates

Logging is considered as one of the most serious threats to biodiversity and to great apes particularly. In recent years, in Africa this view is more nuanced in the case of responsible sustainable logging in particular in FSC³ certified concessions, where specific ecological and social requirements are imposed and the ban on hunting of primates and especially great apes is strictly enforced. This it is not the case in WA. In West Africa an estimated 80% of the region's original forest cover was gone by the 1980s, affecting not only the habitats of great apes but also the rainfall (during the last three decades, precipitation has diminished in West Africa even faster than it has in the drier regions of the Sahel (Paturel et al. 1995, Servat et al. 1997). In West Africa, the IUCN Red List lists as Critically Endangered the following primates: (i) Niger Delta red colobus; (ii) Preuss's red colobus and (iii) Cross River gorilla. The Endangered primates (IUCN Red List) are (i) White-naped mangabey; (ii) Drill; (iii) Preuss's guenon; (iv) Roloway monkey; (v) Benin subspecies of red-bellied guenon; (vi) Badius species of red colobus; and (vii) Nigeria-Cameroon chimpanzee.

1.2.2.4 Carnivores

West African lions have unique genetic sequences not found in any other lions, including those held in zoos or other form of captivity. Recent surveys (January 2014) have suggested that the African lion population is facing extinction across the entire West African region⁴. The results represent a massive survey effort taking six years and covering eleven countries where lions were presumed to exist in the last two decades. The team discovered that West African lions now survive in only 3 national parks and in the trans-frontier WAP complex. The PAs with lion are only in 5 countries: of West Africa: Senegal, Nigeria, Benin, Niger and Burkina Faso. Counting lions is extremely difficult, and we may never know precisely how many lions there are in West Africa, especially if few specialists suppose that we can find lions outside the PAs. In West Africa, the primary threats to the lions are: (1) the loss, degradation and fragmentation of lion habitats; (2) the decline of the lion's wild prey base and (3) human-lion conflict. The lion is the principal predator of domestic cattle, so livestock loss combined with poor capacity for managing human-lion conflict lead to the elimination of lions, particularly by poisoning (Di Silvestre, 2002). Trophy hunting is only practiced in three lion conservation units.

A West and Central Africa regional conservation strategy for cheetah and African wild dog is being drafted. The Saharan **cheetah** (Critically Endangered since 2009 in the IUCN Red List) is very rare but can still be found in small numbers in Algeria (Ahaggar and Tassili N'Ajjer) and Niger (Termit and Aïr), and possibly also in Mali, Chad and Mauritania. In the south, cheetahs

³ Forest Stewardship Council

⁴ The lion in West Africa is critically endangered, Panthera's Lion Program Survey, Dr. Philipp Henschel, PLOS ONE, 2014

are known to occur in the W Trans-border Park and the Arly Pendjari PAs. Although a persecuted species, this large carnivore is probably scarce by nature and also impacted by the effects of periodic droughts on its prey species.

African wild dogs have disappeared from much of their former range in West Africa where they were present in all regions from deserts to mountain summits with the exclusion of the lowland rainforest and the driest deserts. The species is virtually eradicated from West Africa, and survives only in Bafing – Niokolo Koba areas.

In West Africa, **leopards** remain widespread, albeit now patchily distributed within the region. The most marked range loss in West Africa has been in the Sahel belt, as well as in Nigeria. They have been locally extirpated from densely populated areas or where habitat conversion is extreme. There are no reliable continent-wide estimates of population size, but it is supposed that in the northern part of the WA savanna-forests there is a low density with less than 1 000 individuals, and in the southern part of the savanna-forests there is a medium density with between 1 000 and 10 000 individuals.

1.2.2.5 *Other rare and threaded species*

The Guinea forest in WA contains half the mammal species on the African continent and other important regional biodiversity values must be mentioned including the West African manatee, the rare pygmy hippopotamus, the zebra duiker and the drill, etc. In view of climate change and increasing frequency of droughts in WA, the number of water-dependent species such as manatees and crocodiles, will come under increasing threat.

1.2.2.6 *Birds*

West Africa plays a fundamental role for Palearctic (European–African) long-distance migratory birds which use the Palearctic Western route from Western Europe through Spain across the Straits of Gibraltar. The ecological networks of habitats play a decisive role for migratory birds, because they provide key sites along migration routes where birds can recover from their strenuous journeys. Many migratory birds have little choice in the selection of suitable areas to use. They need access to specific sites located along their migration routes. If one of these important sites is damaged or destroyed, it usually means disaster for the birds that depend on that site. So it is vital for West Africa to preserve a functional network of habitats for birds and especially the several wetlands in the Sahelian zone such as: Niger and Senegal rivers, the inner delta Niger (30,000 km² situated in the middle of the Sahelian landscape) and floodplains in Senegal and Niger, which are very important for millions of migratory birds.

1.2.2.7 *Aquatic species in inland waters*

The inland waters of western Africa support a high diversity of aquatic species with high levels of endemism. Many of these species provide direct (e.g. fisheries) and indirect (e.g. water purification) benefits to people. More than 14% of species across the region are currently threatened and future levels of threat are expected to rise significantly due to a growing population and the corresponding demand of natural resources. The West Africa region supports a significant proportion of the world's species dependent upon freshwater wetland habitats. Given that the region represents approximately 5% of total global land mass (excluding Antarctica), it is apparent that many groups, waterbirds, plants and mammals in particular, are well represented within the region. Of the 1,435 species assessed here at the regional scale, just over 14% are regionally threatened.

1.2.2.8 *Rare and high-value trees*

In West Africa the movement of people south towards the humid tropical areas has resulted in depletion of natural resources: loss of primary forests and woodlands, repeated logging of the secondary vegetation, and depletion of a number of plant species. These include the extraction of trees for charcoal-making, general timber and high-value woods. Most affected of the high-value woods are (a) Afromosia or African Teak *Pericopsis elata* (endangered or critical endangered - with levels of exploitation that have been unsustainable in all countries and the species' habitat has declined, especially in Côte d'Ivoire⁵,

⁵ CITES, 7 September 2012, country currently subject to a recommendation to suspend trade of *Pericopsis elata*

Ghana and Nigeria), (b) the Meliaceae family (*Khaya species*), (c) Vène (*Pterocarpus erinaceus*), and (d) African Blackwood (*Dalbergia melanoxylon*).

This strategic approach document cannot analyse all the biodiversity aspects of the West Africa region. Consequently, we used the information from several sources already organized as macro- indicators and indicators or as aggregated data to examine the trends in the conservation status of key species. The analysis was complex because of the difficulties of obtaining updated and structured data. The results of the exercise should be considered only indicative of trends in conservation status based on information currently available (see Table 3 and Figure 5). For more details tables and maps are available by request.

Table 3. Synthetic indications of trends of the key, rare and high value species of major ecotypes

The number of arrows indicates the strength of the decline (red) or recovery (green).

A - Desert	B – Savannas	C – Forests	D – Mangroves
Scimitar Oryx ▼▼▼	Lion ▼▼▼	Niger Delta red colobus ▼▼▼	Niger Delta red colobus ▼▼▼
Saharan cheetah ▼▼▼	Wild dog ▼▼▼	Preuss's red colobus ▼▼▼	West African manatee ▼▼▼
Dama Gazelle ▼▼	Cheetah ▼▼▼	Cross River gorilla ▼▼▼	
Addax ▼▼	Leopard ▼▼▼	Roloway monkey ▼▼▼	
Dorcas Gazelle ▼	Giant eland ▼▼▼	Drill ▼▼▼	
Afrotropical-Palaeartic and piscivorous birds ▼	Manatee ▼▼	Nigeria-Cameroon chimpanzee ▼▼▼	
	Elephant ▼	Pygmy hippopotamus ▼▼▼	
	Afrotropical-Palaeartic and intra-African migration birds ▼	Jentink's duiker ▼▼▼	
	Chimpanzee =	Forests Elephant ▼▼▼	
	Giraffe ▲		
	Roan antelope ▲		
	Buffalo ▲▲		

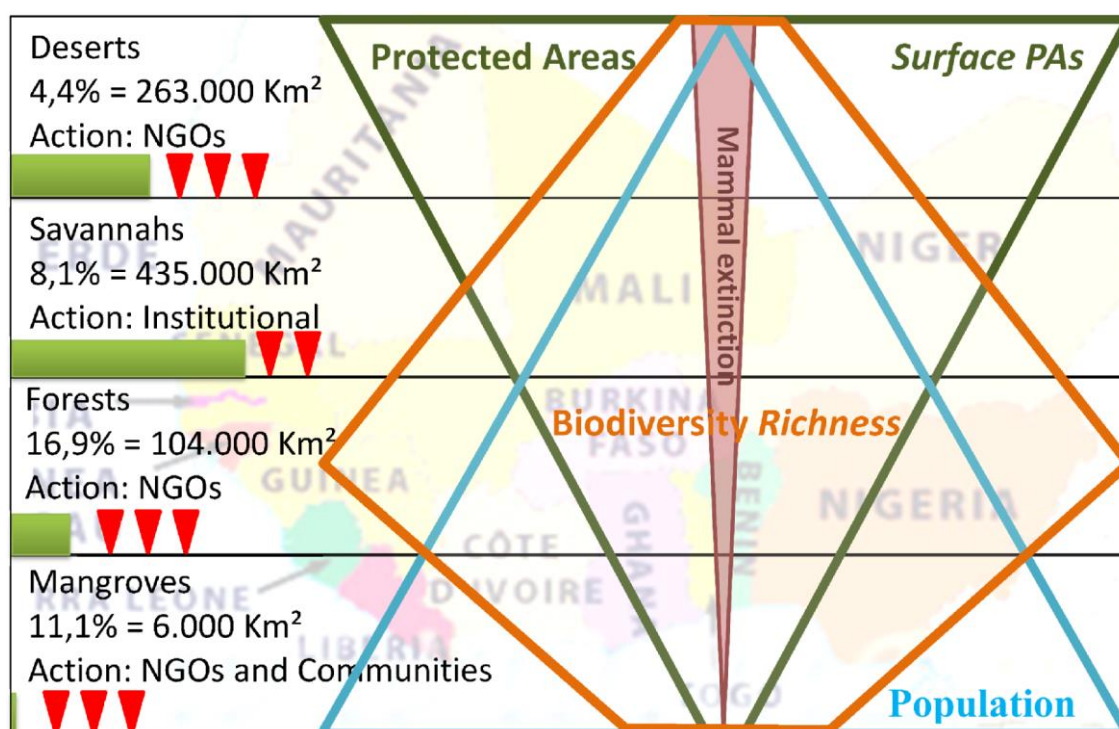
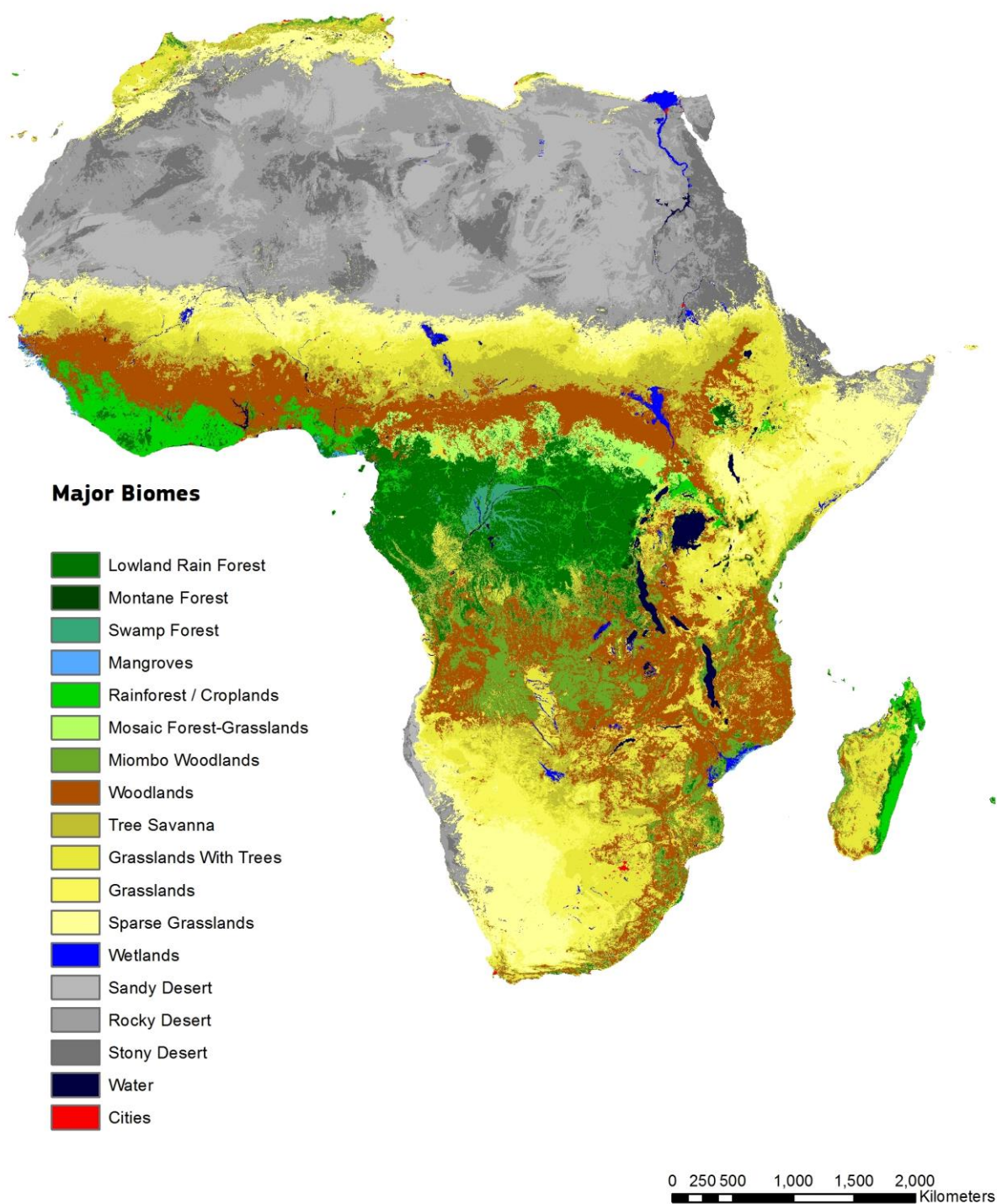


Figure 5. Schematic representation of conservation in WA according to the major ecotypes.

Note for each Major Ecotype:

- 1. the geometric rhomboids shows indicatively (a) proportion (of ecotype surface area) of PAs between the different ecotypes, progressively smaller going from deserts to mangroves areas (green); (b) human population size, progressively larger from deserts to coastal areas (blue); (c) biodiversity richness, more important in forests ecotypes (orange) and (d) mammal extinctions, stronger in the deserts and savannas than in forests and mangroves ecotype (pink).*
- 2. the green histogram represents the combined area of PAs in each ecotype as a percentage of the total area of PAs in WA, red arrows denote declines in species status. High species declines in the desert areas indicate problems facing desert mammals.*

Figure 6. Overview of ecological characteristics of the West African region



1.3 OVERVIEW OF REGIONAL-SPECIFIC ASPECTS OF THE WEST AFRICAN REGION

1.3.1 Regional institutional support

There are two principal economic and political regional institutions: the Economic Community of West African States (ECOWAS) with 15 countries (Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Senegal, Sierra Leone and Togo) and the West Africa Economy and Monetary Union (WAEMU) with 8 countries (Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo). The WAEMU is more operational than the ECOWAS and acts more directly on the harmonization of policies and interventions in the areas of agriculture, forestry and conservation. The WAEMU may occur throughout the West African region at the request of countries; institutions use this possibility for moving forward on convergence plans (strategic plans) on management of wildlife and forest resources. This approach could help if oriented towards the definition of a common regional conservation strategy.

1.3.2 Conservation capacity building in WA

This analysis considers the available institutional capacities and the present and future management needs of protected areas in WA. The IUCN training needs study for West and Central Africa⁶ highlights current inadequacies. In particular it concludes that training institutions in West and Central Africa: (1) do not provide skills for improving management effectiveness of PAs, (2) do not provide an adequate knowledge base and practical tools for PA management, (3) do not adequately address the needs of biodiversity conservation. The study identifies the most important training needs and the institutions that offer courses on the subject, but does not address the training requirements for rangers in terms of protection and interactions with resource-users in the buffer zones. We recommend that capacity building for PA management effectiveness is enhanced by integrating WA and CA training institutions.

In WA there are currently two training schemes supported by IUCN and implemented in collaboration with the University of Senghor - Egypt: (1) university degree (DU) capacity building in protected area management (training of 8 weeks in Ouagadougou - Burkina Faso) (2) Masters in Development, specializing in management of protected areas (2 years, in Alexandria - Egypt). In CA the formal training options are: (1) a Masters, with an option in PA management, at the "École Nationale des Eaux et Forêts" (ENEF) of Cape Esterias in Gabon, (2) a training LMD with the "École Régionale d'Aménagement intégré des Forêts et Territoires tropicaux (ERAIFT) in Kinshasa – DRC, and (3) a three year professional certificate to be developed at the "École de Faune of Garoua" (EFG) in Cameroon.

Further analysis is required of existing capacity building activities, and the new skills required by PA managers and rangers are still to be identified. The recipients of capacity building should be: (1) the departments of wildlife and protected areas, (2) the parastatal agencies responsible for PAs management (e.g. the CENAGREF in Benin or the OFINAP in Burkina Faso), (3) PA managers and rangers, (4) the national and international conservation and development NGOs, (5) the local administrations and communities as part of the implementation of decentralized natural resource management policies, (6) the private sector (companies related to the sectors of forest, ecotourism and safari hunting).

Finally, if the future PA management and governance training requirements are to be adequately covered in West and Central Africa, the type of training offered by regional institutions must evolve in line with modern conservation approaches. The capacities of the institutions to dispense this training must be greatly strengthened. In addition a selected number of PAs where ranger training can be given must be identified and long term financial and technical partnerships built to ensure uninterrupted high quality training opportunities.

⁶ Yves Hausser. 2013. Assessment of the regional needs and training availabilities for professionals of protected areas in West and Central Africa. IUCN.

2. CONSERVATION CHALLENGES AND ISSUES

2.1 KEY DIRECT THREATS TO CONSERVATION IN WA

In West Africa, we differentiate between 'direct threats' which comprise the proximate human activities or processes that impact on wildlife (in the past, present or future) such as unsustainable fishing or logging, and 'indirect threats' which are the ultimate drivers of biodiversity decline such as human population growth, poverty increase and government budget reductions. Thus direct threats are synonymous with sources of stress and proximate pressures. The principal direct threats to the survival of wildlife in the various ecosystems of WA are **loss of habitat for wildlife** and **unsustainable hunting** by humans.

West Africa still has one of the highest annual population growth rate of any region on the continent (or in the world), estimated at about 2.6% in 2012 (AfDB 2012)⁷. Economic development (and particularly the growth of commercial agriculture and extractive industries) has accelerated in forest-zone countries as several civil conflicts have subsided. West Africa currently has the fastest rate of GDP growth on the continent, predicted at 6.8% in 2013 and 7.4% in 2014 (AfDB 2013)⁸. These drivers are reinforced by the tendency of all human beings (not just those in West Africa) to give priority to their short-term self-interests, and to consume resources beyond their immediate survival needs.

In the forest zone of Western Africa, the **area of relatively undisturbed high-canopy rain forest in West Africa has been steadily declining over the last 100 years**. Outside the few national parks that protect rain-forests and some forest reserves, the rate of forest loss may recently have accelerated. Good data are lacking for many countries in the region, but the estimated annual percentage forest loss in Nigeria in 2000-2010 was the highest in the world, at 3.7% (FAO, 2010). Forest is being lost to subsistence agriculture, the expansion of industrial-scale plantations of oil palm and other crops (including "land grabs" that involve foreign companies), timber and fuelwood harvesting, mining operations, road and dam construction, and the spread of settlements. In other words, West Africa today is being affected by the same kinds of development that long ago destroyed the original forest cover of much of Europe, the USA and large areas of East Asia. It is difficult to single out one of these threats as more significant than another – and they vary in extent from country to country – but **farming and plantation agriculture are probably causing greater forest loss than any other activities**.

Hunting of wild animals for meat has been a major factor in the decline of larger mammals in West Africa for a very long time, probably related in significant part to high human population density and long-established trade networks. Hunting for subsistence has always been important, but as human populations have continued to grow and urbanization increase, hunting has become increasingly commercialized, and supports an important "bushmeat trade".

The bushmeat trade is pushing some mammals species (**and rain-forest primates especially**) **towards extinction**, in part because their populations have often been reduced to small, highly vulnerable isolates by loss of habitat (Oates et al 2000). Mammals species of the West African forest zone rated as Critically Endangered (CR) or Endangered (EN) on the IUCN Red List are: *Cephalophus jentinki* (Jentink's duiker, EN); *Choeropsis liberiensis* (Pygmy hippopotamus, EN); *Gorilla gorilla* (Gorilla, CR – only in Nigeria in the West African region); *Mandrillus leucophaeus* (Drill, EN – only in Nigeria in W. Africa); *Pan troglodytes* (Chimpanzee, EN); *Procolobus badius* (West African red colobus, EN); *Procolobus preussi* (Preuss's red colobus, CR – only Nigeria in W. Africa). Several subspecies are also rated as CR or EN, and many species and subspecies (including the African elephant) are listed as Vulnerable.

There are only a few areas within the West African forest zone where all wildlife is fully protected by law. From Guinea to the Nigeria-Cameroon border there are **only 11 national parks distributed across eight countries in the forest zone**, together with a handful of wildlife or game sanctuaries. Most of the national parks are small (less than 50,000 ha in area) and therefore not of maximum value for the long-term protection of viable populations of large mammals. Liberia, which lies at the heart of

⁷ Africa's Demographic Trends, <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/FINAL%20Briefing%20Note%204%20Africas%20Demographic%20Trends.pdf>

⁸ West Africa Monitor, http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/West_Africa_Monitor_2013.pdf

the Upper Guinea forest region, and which is clearly a biodiversity hotspot, has only a single national park, Sapo. Even within the few national parks, management is generally weak and hunting for bushmeat often rife.

2.1.1 Availability of funds for PAs

Analysis

Funding is a critical limiting factor for all the PAs in Western Africa. International and domestic funding for PAs have struggled to keep pace with the growth in the number and area of PAs and the economic crisis. Governments have progressively reduced funding due to the negative economic trend in the region that began in 1960 with the most difficult times in the 1990s. Despite the current economic recovery in WA, and the endorsement of international environmental treaties and the commitments for the creation of more protected areas, government funding for PAs is still very low. On an area basis of just US\$150/km²/year (source: ODA Official Development Assistance), only a few EU projects of PAs in Western Africa spend close to this target (about US\$120-140/km²/year) while private funding for game reserves in WA is far less, although the size of this contribution is unclear. In conclusion, the current spending on PAs is grossly inadequate, not only to support the costs of existing sites, but also to ensure the creation and effective management of a representative regional system of PAs.

The existing low level of financial support for biodiversity in WA is mirrored by a low capacity level in the management of PAs. It is extremely rare to find examples of good management effectiveness of wildlife in the region. The funds invested in conservation give only weak and very short effects without long-term sustainability outcomes. This funding gap has historical reasons arising from the way that institutions were established. Whereas institutions providing capacity-building in forest management and the creation of strong forestry bodies in the countries were developed, the same process was not implemented for wildlife management. The lack of capacity to manage wildlife has led to a general underestimation of the value of wildlife in government. The final result was the development of an operating strategy for natural resources that did not incorporate improved management of wildlife. This situation stands in marked contrast with that in EA and SA.

High population growth, political instability and unfavourable natural processes (desertification and fragility to climate change) have contributed to the reduction of protected areas as they become utilised for agricultural and pastoral uses.

Investments in wildlife conservation in WA must be oriented in a variety of activities: building PA management capacity, protecting endangered species, improving communication about the values of biodiversity, improving the monitoring of biodiversity, and tackling corruption and illegal trafficking. The only hope for WA biodiversity is to restore the fundamentals of conservation and to bring about sustainability in the uses of natural resources.

Effects

Under resourcing is the most important constraint acting on management effectiveness. The PAs of Western Africa do not have enough staff, resources, equipment and infrastructure to ensure the control of conservation areas (including anti-poaching measures and bio-monitoring) and the development of community-based supporting activities in the buffer zones. This results in degradation and encroachment of the PAs which can ultimately lead to their degazettement.

2.1.2 Institutional governance of PAs

Analysis

In most WA countries the State is the owner of the land and of the natural resources. In the past, governments established numerous and large protected areas, and classified forests and game reserves. To manage the various conservation aspects, the governments created centralised institutions for forestry, parks or wildlife and more recently for the environment.

Effects

The indirect drivers such as population growth, poverty increase, government budget reductions, increased democratization and decentralization, and sectorial approaches render ineffective many aspects of direct centralised management of wildlife and protected areas by the State. Also their institutions are ill-adapted to cope with rapid structural changes in the countries. Protected area agencies are seen by WA governments as a relatively low priority, and until now tend to be too centralized. Their staff structures are often out of date, staff training is inadequate, and their enabling legislation is too restrictive.

2.1.3 Illegal wildlife trade income and corruption

Analysis



Given the decline in purchasing power of salaries over the past 30 years and the increased incomes possible from illegal wildlife trade, corruption has spread and it is growing at all levels with the involvement of populations, local and central government bodies including forest rangers and officers, police, army and justice. The increasing importance of the WA coast as a key transit hub for drugs is another potential danger for the illegal wildlife trade.

Poaching levels of elephant in WA have increased since 2006 but not as rapidly as in the other regions. However in WA the rise in poaching is particularly worrying because the small fragmented populations could disappear completely. In the WAPOK complex however the populations is estimated at nearly 8 000 individuals (WAEMU/UNDP, 2013) which is more robust although 150 elephant were lost in 2013 (Box 1).

Figure 7. Illegal live baby chimpanzee trade

The issue of bushmeat hunting is highly politicized and the commercial circuits are well organized to supply the urban areas where it is consumed. The high rate of bushmeat harvest, combined with habitat loss and alteration, has led to very severe population declines. It has already resulted in widespread local extinctions throughout the Upper Guinea Forest Ecosystem of West Africa. The forests and savannas with no large animals are known as the 'Empty Forest' or 'Savanna Syndrome'.

The large and small antelopes of Western Africa can be considered amongst the most beautiful in the continent (including giant eland, roan antelope, major hartebeest and Zebra duiker) but they are the object of black-market traders who will smuggle live animals into wealthy countries, including other African countries such as South Africa (Figure 7).

Effects

Poaching in the small and highly fragmented elephant populations of West Africa is high, and increasing throughout the region. Ivory trafficking through Nigeria is the major illegal wildlife trade in WA. ETIS statistics⁹ indicate Nigeria and Togo are the major exit points but ten other countries are also involved either as source countries for export, transit countries or countries with significant domestic markets. Nigeria is the country with the largest flows of illicit ivory but more recently other countries such as Togo have become involved in large-scale smuggling of ivory. Most of this ivory appears to originate in Central Africa, but Nigeria was also identified as the destination of major shipments of ivory from Kenya, suggesting that ivory from as far away as Eastern Africa may now be moving through this country. The increasing involvement of Chinese buyers in Nigeria, as well as the involvement of organised crime syndicates in the illegal wildlife trade and deforestation for cannabis cultivation, means that Nigeria is playing an increasingly important role in biodiversity loss in WA.

⁹ UNEP, CITES, IUCN, TRAFFIC (2013). *Elephants in the Dust – The African Elephant Crisis*. A Rapid Response Assessment. United Nations Environment Programme, GRID-Arendal. www.grida.no

Box 1. Importance of WAPOK



THE WAPOK COMPLEX

The WAPOK complex is a large area about 38,000 km² of intact habitat that is of great importance to the survival of large mammals in West Africa, including many that are endangered. These different blocks constitute the largest remaining wilderness and the only functional ecological complex in WA.

This large landscape of contiguous conservation areas is located at the frontiers with Burkina Faso, Benin, Niger and Togo. The landscape encompasses one transborder park (W), two national parks (Pendjari and Keran), two more important faunal reserves (Arly and Oti Mondouri), one Giraffe area not classified, 10 hunting concessions and many adjacent villagers' hunting zones.

The complex is situated in a transition zone between savanna and forest lands. The site reflects the interaction between natural resources and humans since Neolithic times and illustrates the evolution of biodiversity in this zone. The park is known for its large mammals: lions, cheetahs, leopards, giraffe, buffalos, roans, hartebeests, manatees, baboons, hippopotamuses. In WA the complex provides a home for the biggest, and in a few cases the last, populations of lions, elephants, cheetahs, manatees and giraffe. The WAPOK area is also known for its bird populations, especially transitory migrating species, with over 350 species identified in the complex.



The 'W' National Park, was so named because of the local configuration of the Niger River.

The PAs in the complex are listed as a UNESCO World Heritage Site (W-Niger and Pendjari -requested), all as MAB/UNESCO (W was the first MAB transborder regional park to be classified in Africa), many of them as Wetlands of International Importance (Ramsar) and as BirdLife International Important Bird Areas. The area is largely uninhabited by humans, having been (until the 1970s) a Malarial and Tse-Tse zone comprising wetlands formed by the delta of the Mekrou River with the Niger. Historically, the area has been at one time a major area of human habitation, judged by the important archaeological sites (mostly tombs and furnaces - it is quite possible that the iron age in the savanna areas of WA started in the W transborder park) found in the area (see the analysis of the ECOPAS projet).

Benin, Burkina Faso and Niger have implemented an inter-state cooperation agreement based on the ecological complex of adjacent protected areas with national parks, wildlife reserves and hunting zones forming a large regional complex (WAP from the name of the major PAs of each country: Regional Park W, Arly Faunal Reserve and Pendjari NP). After several years of intervention, under the supervision of the WAEMU and the support of the EU and German funds, there was an improvement on the status of the natural ecosystems. Given the success of the conservation intervention in the WAP complex, Togo in the years 2006-2009 proposed to join the initiative with adjacent PAs Oti-Mandouri and Keran so the complex has been enlarged and has now become WAPOK (this name comes from the names of the most important PAs of the four neighbouring countries (W-A-P-O-K). At present, the situation in the WAPOK complex is at risk of degrading with increasing pressures from elephant poaching, mining, increasing poverty in rural and urban areas and desertification. Conservation interventions should be based on a participatory approach involving the political and technical representatives at central and decentralized levels, traditional authorities, users, people, private sector, NGOs, national and international institutions and the civil society.

One favourable factor is that bushmeat is no longer the most important source of protein in the region because the wildlife populations have been so depleted by years of unsustainable hunting for meat. Furthermore analyses in Ghana indicate that among cocoa farmers, the value of harvested bushmeat is relatively low and contributes little to household production. Ungulates and primates have been replaced by rodents as the most commonly eaten wild animals.

The illegal live mammals' trade is concentrated on Togo. The country acts as a hub for the transit of large and small WA antelopes destined for hunting reserves of other African countries and even outside of Africa (see the officially sanctioned captures of

giant eland in Niokola-Koba National Park for export). A small illegal wildlife trade in ivory trinkets, birds and live small animals occurs along the coasts from Nigeria to Mauritania.

2.1.4 Weak planning, management effectiveness and monitoring of PAs

The analyses of the illegal wildlife trade (above) have some common and specific aspects. First, we present here some possible common solutions.

Analysis

The quality of PA management effectiveness in WA is poor, and in some cases very poor. The IUCN management assessments conducted in the PAs of WA scored far less than PAs in other African regions. To put this in wider context, the overall mean for the assessment of African PAs is well below the world mean.

Effects

PAs in WA are managed with insufficient knowledge of the biodiversity values, trends and threats arising from direct and indirect causes. There is a lack of planning, monitoring, adaptive management and proactivity. Inadequate resources and weak capacities to implement the management processes lead to the general loss of biodiversity in the region and a loss of ecosystem services provided by the PAs. At present, the WAPOK complex, composed of PAs and hunting reserves covering more than 38.000 Km², is the only functional and stable ecological complex, despite the high threats that it faces. Major parks and reserves in WA are highly degraded, but even so a few can still be recovered. Specific projects are needed to preserve important or endemic species. In a few degraded protected areas, the administration still provides an institutional presence in the hope of a possible recovery of the area at some later date. The general tendency, however, is to reduce the conservation areas because of lack of funds and capacities to manage them.

Solutions

As planning, management and monitoring are closely linked, integrated solutions must be found. We recommend the following general solutions:

- Improving information to build a more effective monitoring and decision-support system in order to facilitate: (i) legitimacy, accountability and fairness in park management, and (ii) adaptive management and proactivity;
- Emphasising the role of stakeholders and rights-holders, local, national and international NGOs, private sector and other non-traditional partners with a view to improving management effectiveness over a broader landscape which includes the PAs and the buffer zones;
- Strengthening institutional capacities (and providing training opportunities) to govern management frameworks and for multi-scale management of protected areas at local, national and regional levels;
- Integrating “species-based” and “habitat-based” approaches;
- Protecting the original ecosystem is generally less costly than ecosystem restoration;
- Integrating *in situ* and *ex situ* conservation of genetic diversity which can serve the needs of restoration of ecosystems and PAs.

2.2 KEY INDIRECT THREATS TO CONSERVATION

Indirect threats to conservation have been defined as the ultimate factors, usually social, economic, political, institutional, or cultural, that enable or otherwise add to the occurrence or persistence of proximate direct threats. (Source: A Standard Lexicon for Biodiversity Conservation: Unified Classifications of Threats and Actions.)

Halting biodiversity loss (or reducing it to a minimal level) requires tackling the combined effect of human activities. The indirect drivers of biodiversity loss are related to economic, demographic, socio-political, cultural, and technological factors. Also, indirect drivers affect biodiversity loss differently from direct drivers. Charismatic mega-fauna, such as elephants, benefit from intense conservation efforts and research when subject to direct or indirect threats to their conservation. By contrast when many endangered species of antelopes, amphibians, insects and plants are affected by indirect drivers but fail to draw the same amount of attention as the charismatic mega-fauna.

The solutions are global and are listed at the end of this chapter (see below).

2.2.1 Population growth and poverty

Analysis

In West Africa, population growth is between 2.5 and 3.5% per annum and this is resulting in increasing levels of poverty over an ever enlarging area. The effect is greater than any of the other African regions and is placing enormous pressure on the capacity of the environment to provide services for human well-being (see figure 8).

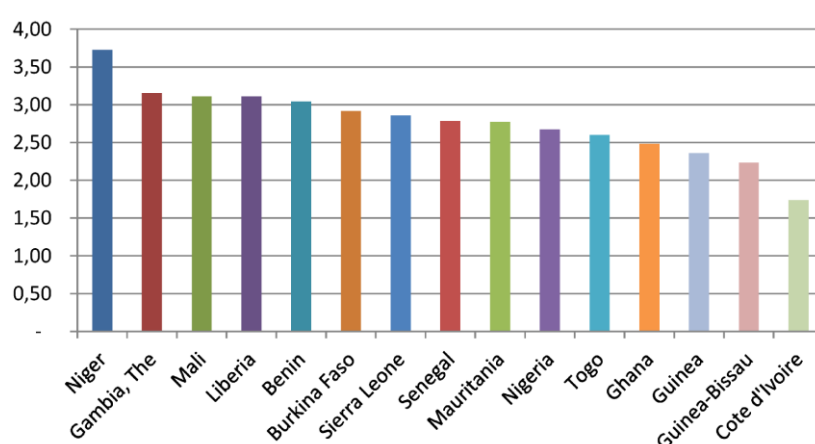


Figure 8. Annual po

Source World Bank, Africa Development Indicators, specific elaboration

Effects

As the demand for resources increases, all the protected areas in WA face pressure from grazing, cultivation, and harvesting of wood, meat, fish, water, and pharmacopoeia. In Burkina Faso the populations in the buffer areas of some parks and reserves draw 33% of their basic needs from the natural resources of the PAs.

reduction and isolation of PA in the landscape

Analysis

As land outside protected areas is exploited more and more intensively in WA, the increasing isolation of protected areas in the landscape poses a serious threat to the long-term viability of many wildlife populations.

2.2.2 Fragmentation,

Effects

The primary effects of isolation of protected areas are: (i) habitat loss (pastoral and forested lands converted to agriculture); (ii) disturbance from human infrastructures (wildlife abundance increases with distance from human settlements); (iii) overhunting (widespread along protected area boundaries) and (iv) disease (transmission from livestock, domestic animals, and humans).

2.2.3 Coup d'états, rebellions, civil unrest and religion fundamentalism, Ebola and refugee crises

Analysis

With the exception of Senegal and Ghana which have had a relatively long period of stability, the WA countries have suffered from political instability, conflicts with rebel movements, civil unrests, conflicts linked with religious fundamentalism and refugee crises.

Effects

Breakdowns in law and order generally have devastating effects on PAs, as recently seen in Ivory Coast. Protected areas and their natural resources become targets for everyone: (i) populations for land, grazing, wood, bushmeat, etc; (ii) illegal traders who target the most precious woods and wildlife; (iii) armies who use wildlife and natural resources as sources of money and food; and (iv) rebels and religious fundamentalist movements who use PAs as places of refuge and sources of funding. Protected areas in WA have, and are still suffering greatly, from these effects. However in cases where there are decentralized systems, and where NGOs and community groups are involved, the PA management and governance have proved better able to partially save conservation areas (e.g. Sapo National Park in Liberia, where the local community was involved in the park's management).

2.2.4 Negative economic trends

Analysis

Between 1960 and 2002, declining national economies and steady population growth in WA meant that the combined effect of servicing international debts and providing education and health care for the burgeoning populations resulted in a reduction of funding for protected areas. Poverty has led to increasing level of poaching and illegal activities in the PAs, and the prolonged political crisis in the Côte d'Ivoire also threatening the economic recovery in WA. The peaceful solution to the crisis in Côte d'Ivoire brought some relief, but higher international oil and food prices have now started to cause inflation.

Effects

The situation for PAs has remained unchanged. PA staff are poorly paid and equipped, materials and equipment are totally inadequate, and infrastructure is poorly maintained. Illegal grazing, wood cutting, agriculture, and poaching in PAs continue, sometimes with the complicity of the PA rangers.

2.2.5 Policy and sectorial approach

Analysis

Investment in the primary sectors like agriculture (e.g. cotton), pastoralism (e.g. transhumance grazing systems), forestry (e.g. logging concessions or firewood provision), wildlife conservation (e.g. new PAs) or in sectors such as mining operations or energy infrastructure all affect the socio-economics of the region and raise a range of political, administrative, economic, industrial, environmental, infrastructural and energy issues. As elsewhere in Africa, the WA countries, with the support of donors and private funds, implement their policies, strategies and projects with a sectorial approach without the inter-sectorial coordination and collaboration that is essential to ensure mainstreaming of natural resource conservation and management issues.

Effects

Governments and populations continue to regard PAs as unproductive areas to be exploited on a short time base (unsustainable exploitation) rather than as important economic and spatial elements of the landscape. Consequently pressures on PAs are increasing and resulting in biodiversity loss and degradation of many ecosystem services.

Possible global solutions to indirect drivers

People make decisions concerning biodiversity based on a range of values related to their well-being, including the use and non-use values of biodiversity and ecosystems. The well-being of local people must dominate many responses, including those relating to protected areas, governance, and wildlife management. Responses to indirect drivers with a primary goal of conservation could be the following:

- Manage protected areas for a wide range of sustainable uses (as is found in IUCN category VI PAs). This is extremely important where, as in WA, biodiversity loss is sensitive to changes in key drivers;
- Design and manage PA systems in the context of an ecosystem approach, with due regard to the importance of corridors and interconnectivity of PAs, if it is possible;
- Mainstream natural resource conservation and ecosystem services in all the primary sectors such as agriculture, pastoralism, forestry, fisheries, mining and in energy;
- Adopt inter-sectorial coordination and collaboration to ensure mainstreaming of biodiversity conservation and management issues;
- Capture the benefits and reduce the costs of wildlife for local communities, especially the local opportunity costs in line with the principle of equitable sharing;
- Increase transparency and accountability of government and private-sector through involvement of concerned stakeholders and rights-holders in decision-making on biodiversity;
- Increase coordination among multilateral environmental agreements and between environmental agreements and other international economic and social institutions;
- Raise the level of public awareness, information-communication and education.

3. ONGOING CONSERVATION EFFORTS

The historical analysis in WA over the last 15-20 years shows that the external funding for conservation was about \$780 million. In terms of percent of the allocation of these funds, Nigeria and Ghana received more than 15%, whilst the smaller countries (Gambia, Guinea Bissau), the less secure countries (Sierra Leone) and the countries of the desert ecotype received about 1-3% of the funds. Funding for transborder protected areas was about 10% of the total. The regional programmes on conservation used about 12% of the available funds.

The analysis can also be extended to each major ecotype.

3.1 DESERTS

International NGOs have long been involved in arid land conservation through reserve management, genetic research, wildlife monitoring, wildlife veterinary work, captive breeding and reintroductions and tourism development (e.g. Zoological Society of London, and Sahara Conservation Fund). Currently conservation in the desert ecosystem is focused on Termit & Tin Toumma (Niger). In the Desert Atlantic Coast there are “Important Bird Areas” (IBAs) such as the Banc d'Arguin NP and the Diawling NP (Mauritania), and Djoudj NP (Senegal).

3.2 SAVANNAS

Savanna PAs have received significant support, particularly from the EU. Today the effort is focused on the WAPOK complex (W, Arly, Pendjari Oti Mondouri -Keran- Benin, Burkina Faso, Niger and Togo). Other PAs receiving lower and more irregular levels of support are Comoé (Côte d'Ivoire); Mole (Ghana); Niokolo Koba NP (Senegal); Gourma Elephant FR (Mali); the Sahel Wildlife Reserve (Burkina Faso) and the Volta Trans-Border Ecosystem Wildlife Corridors (Burkina Faso and Ghana).

3.3 FORESTS

There have been numerous projects in support of rainforest PAs but only a few of these areas still retain their biological value. Where the administration alone is responsible for management, the PAs are effectively “paper parks”. PAs with important biological values are: Gola Forest Reserve and Loma Mountains (Sierra Leone), Sapo (Liberia), Tai (Ivory Coast), Cross River (Nigeria), and Ankasa and Bia Conservation Areas (Ghana). There are interesting possibilities for a landscape approach in which the PA is at the core of wider sustainable land uses. The particular landscape approach could be adjusted according to a wide range of conditions and land-use practices, from strict protection to intensive development. The communities surrounding PAs could benefit from forest and biodiversity resources and services whilst contributing to their conservation.

At the same time, well managed commercial forest blocks contribute to the protection of PAs and biodiversity. The landscape approach is, therefore, a wider mosaic of land uses where the protected areas form part of the overall socio-economic network: human settlements, agricultural areas, forested and non-forested areas. Interesting possibilities for a landscape approach are: (i) Gola Forest Reserve (Sierra Leone) and the Lofa and Foya Forest Reserves (Liberia), (ii) Mount Nimba & East Nimba Nature Preserve (Guinea, Ivory Coast and Liberia), (iii) Outamba - Kilimi National Park (Sierra Leone) and Madina Oula, Soy & Oure Kaba sub-prefectures (Guinea). It is important to underline that there are still important forests blocks that could complement the overall biodiversity of this ecotype but these do not have protected area status. Granting this added protection should be a priority.

3.4 MANGROVES/COASTAL

There are few PAs in the mangroves forests. The Niger Delta, the most important area of mangrove forest in Africa, and the third most important in the world, does not have a protected area. In WA the most important example of mangrove conservation is the public-private partnership for conservation, management and sustainable use of mangrove forests in Guinea Bissau (Orango National Park, Tarafes Cacheu Natural Park and Cacheu Mangrove, Lagoas de Cufada, Cantanhez Forest, Rio Grande de Buba, Cufada, and Cantanhez Forest). In Guinea Bissau, the intervention enabled six new conservation areas to be created – a rare success story in the conservation of this important ecosystem. In the other countries actions on mangroves

are basically shared between the administration, communities and NGOs: as with Songor Lagoon and Keta Lagoon Ramsar site (Ghana) and Niimi National Park (Gambia). Other coastal conservation actions target "Important Bird Areas": the Banc d'Arguin NP and the Diawling NP (Mauritania), the Saloum Delta NP and the Lower Casamance NP (Senegal). The remaining blocks of mangrove forests constitute an opportunity for the establishment of new conservation areas. This action should also be a priority.

In conclusion biodiversity conservation in WA is characterised by (i) low funding for desert PAs but with the benefit of strong involvement by NGOs, (ii) an almost constant level of support going to the protected savanna areas; (iii) low funding for rain forest protected areas with mixed interventions of government and NGOs; (iv) a small scale success story for the recovery of mangrove forests through a public-private partnership.

4. LESSONS LEARNED AND PROMISING APPROACHES

4.1 NEGATIVE LESSONS LEARNED

- The fragility of ecosystem conservation in WA is made worse by the continuing nature of the key indirect threats (instability, high population growth, etc.). The phenomenon is further amplified by the absence of a culture and tradition in PA management and the lack of education and training in wildlife and protected areas management.
- The futility over the long-term of short-term investments in conservation in countries where indirect threats to natural resources and biodiversity are high.
- The severe drought cycles linked to climate change have led to the spread of pastoralism and transhumance essentially at the expense of savanna PAs. This phenomenon is made even more acute by the investment of powerful and influential people (politicians, administrators, traders) in livestock. As a result it is extremely difficult to oppose the illegal occupation of PAs by transhumant herders.
- The enormous challenges posed by corruption, particularly in public institutions.
- Wasting a huge potential in promoting an exclusively ethnic and cultural tourism in the deserts areas and omitting to invest in ecotourism and safari hunting despite that potential (i.e. WAP transborder park and the wildlife reserves).
- The abandonment of the fundamentals of PA management (control of territory, anti-poaching activities, bio-monitoring, etc.) in favour of less expensive and more popular actions; new strategies for the maintaining of PA control alongside conflict management have not been instigated.
- Encouraging NGOs to take on a major role in conservation has not always helped state structures to address their issues of weak capacities. Furthermore the predominant position occupied by NGOs has sometimes led to a situation where the main priority of the NGO is to maintain its position of power and influence rather than to pursue the conservation objectives.

4.2 POSITIVE LESSONS LEARNED

- Long-term and sustained conservation investments and professional management, as in the case of the EU funded W Trans-border Park project, has been shown to have very positive conservation outcomes in terms of reduced illegal activities, increased wildlife, ecotourism development and environmental education.
- The potential of public-private partnerships for conservation and sustainable development in the mangrove forest ecosystem in Guinea Bissau.
- The importance of the work of strongly motivated national and international NGOs with clear objectives: e.g. the conservation of desert antelopes, assisting government in law enforcement as in relation to the trade in great apes and ivory, and the protection of great apes (e.g. Last Great Ape Organisation – LAGA/NGO in wildlife law enforcement), giraffes and other charismatic species.
- Using cultural heritage, even in times of conflict, to promote the protection of important areas such as the conservation activities in the Gola Rainforest National Park which have involved the communities of both Sierra Leone and Liberia who share similar cultures as well as many species of plant and animal use.
- The potential of sport hunting areas (e.g. Burkina Faso) which help to maintain the only functioning ecosystem (including its elephant population) in the major savanna ecotype of WA.
- The potential for a species to become a national symbol as in the case of the giraffe in Niger. During the great drought of 1984 about 50 giraffes moved south to Niger from Mali. Currently the population numbers nearly 400 animals, living outside a PA and protected jointly by local populations and the national wildlife service.

4.3 PROMISING APPROACHES

Improving biodiversity conservation in WA should be based on the regional integration of three strategies: (A) consistent, uninterrupted interventions on the ground with a specific strategic approach to each major ecotype, with strong coordination between ecotypes; (B) a decision-support system based on the collection and organisation of information on biodiversity and management effectiveness in collaboration with the BIOPAMA EU programme; and (C) shared decision-making at institutional and political levels (Figure 9). The success of this overall approach will depend on the functional integration of these three specific strategies.

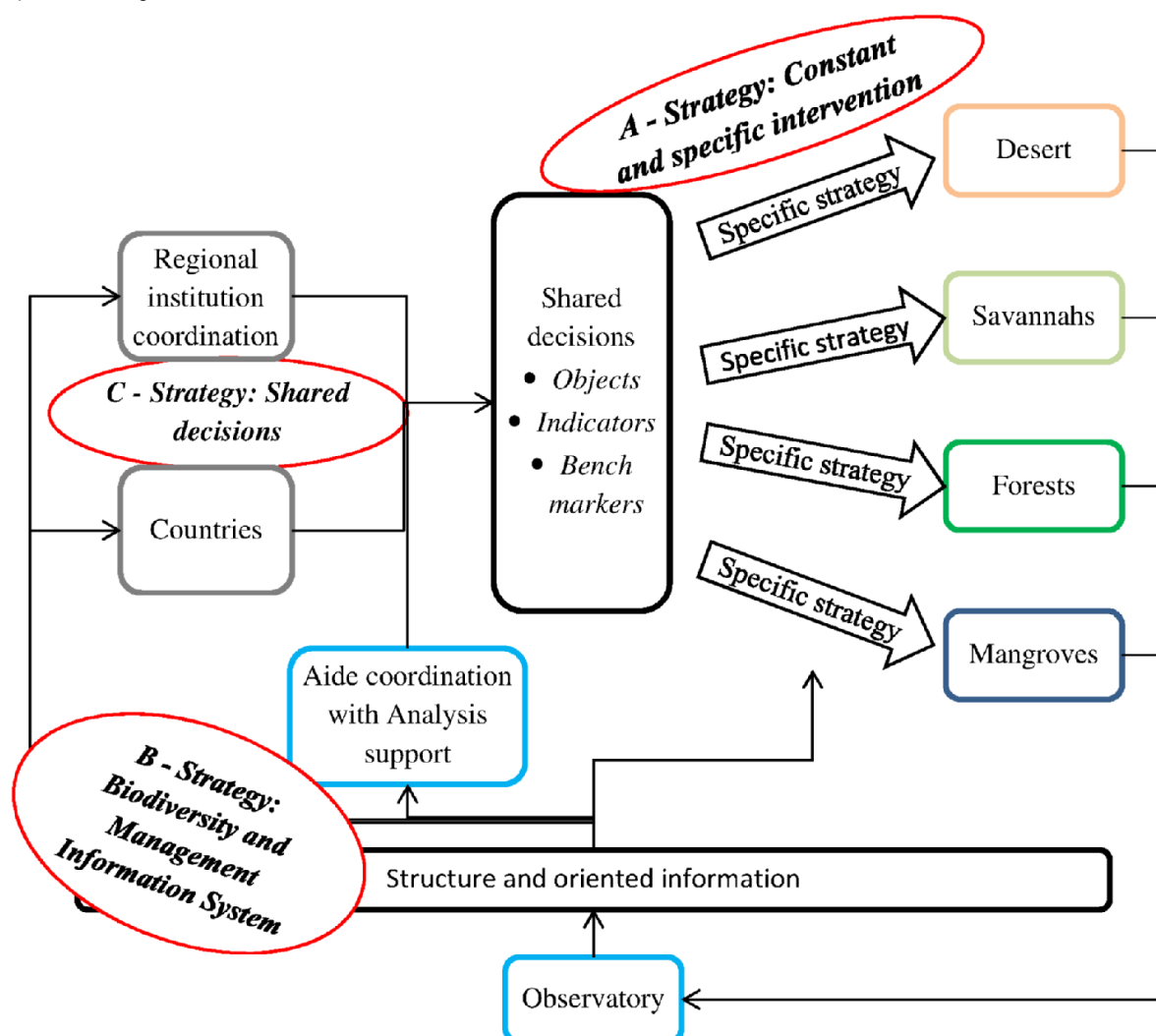


Figure 9. Promising approach to improve the protection of biodiversity in WA

4.3.1 Constant and specific intervention on the ground

The strategic approach is based on the consistency of interventions in the four major ecotypes: (1) Deserts, (2) Savannas, (3) Forests and (4) Mangroves/Coastal. The specific intervention strategies on the ground are based on a composite approach (only in alphabetical order): (i) composite *in-situ* and *ex-situ* conservation, (ii) ecosystem approach, (iii) habitat approach, (iv) *in-situ* conservation, (v) species approach. Below are presented the proposed priority intervention approaches for each major ecotype in WA (Table 4).

Table 4. Composite strategic approach for interventions in the four major ecotypes

Priority	Deserts	Savannas	Forests	Mangroves/Coastal
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1	Species	<i>In-situ</i> conservation	<i>In-situ</i> conservation	Ecosystem
2	<i>In-situ</i> conservation	Ecosystem	Ecosystem	<i>In-situ</i> conservation
3	Composite <i>in-situ</i> and <i>ex-situ</i> conservation	Species	Species	Habitat
4	Habitat	Composite <i>in-situ</i> and <i>ex-situ</i> conservation	Habitat	Species
5	Ecosystem	Habitat	Composite <i>in-situ</i> and <i>ex-situ</i> conservation	Composite <i>in-situ</i> and <i>ex-situ</i> conservation

4.3.2 Biodiversity and Management Information System

In WA, data on conservation are scattered, often out of date and not focused on the issues to be solved. The sources of information at the global level are very generic and do not allow the development of a strategic approach with a coordinated series of conservation activities. The BIOPAMA¹⁰ project proposes the creation of regional observatories in Africa and then to connect the collected information in a more general system (DOPA¹¹, managed jointly with IUCN). Through this project the EU has an opportunity to turn the simple provision of information into a system that will enable conservation data to be organized and used in a decision-support system to identify priorities, formulate strategies and monitor the impact. The synergies between information, decision making and conservation action are essential.

Box 2. Biodiversity and Protected Areas Management Project (BIOPAMA)

Box 3. Digital Observatory for Protected Areas (DOPA)

BIOPAMA: The Biodiversity and Protected Areas Management Programme (BIOPAMA) is an initiative of the ACP Secretariat funded by the European Union. BIOPAMA aims to address threats to biodiversity in African, Caribbean and Pacific (ACP) countries while reducing poverty in communities in and around protected areas. Specifically, the program will enhance existing institutions and networks by making the best available science and knowledge available for building capacity to improve policies and better decision-making on biodiversity conservation, protected areas management and access and benefit sharing.

BIOPAMA consists of two components:

1. Protected areas component (jointly implemented by IUCN, International Union for Conservation of Nature and the EC-Joint Research Centre), that includes:
 - 1.1. Capacity building for regional and national institutions and agencies and protected areas managers;
 - 1.2. Improved access to and availability of biodiversity data through the establishment of regional observatories and information systems to improve decision making.
2. Access and Benefits Sharing (ABS), component implemented by the Multi-donor ABS Capacity Development Initiative managed by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

The actions of the protected area component will be implemented in four BIOPAMA regions: West and Central Africa, Eastern and Southern Africa, the Caribbean and the Pacific. One of the main objectives is establishing Regional Observatories that should support the conservation interventions in the field with:

- Developing a Regional Reference Information System (RRIS)
- Supporting decision-makers at various levels (regional, national, and local – PA level)
- Strengthening capacity-building
- Operating a regional review on information needs and gap analysis
- Indicating priorities of PA funding (ACP/EU ++) and addressing Aichi targets and national reporting obligations to MEAs
- Supporting the assessment of biodiversity values mainstreaming biodiversity
- Contributing to improve PA Management Effectiveness
- Proposing the assessment of ecosystem services - arguments for protection

¹⁰ BIOPAMA, The Biodiversity and Protected Area Management Programme

¹¹ DOPA, Digital Observatory for Protected Areas

4.3.3 Shared political and institutional decisions

THE DIGITAL OBSERVATORY FOR PROTECTED AREAS (DOPA)

DOPA has been developed by the Joint Research Centre of the European Commission to support the European Union's efforts "to substantially strengthen the effectiveness of international governance for biodiversity and ecosystem services (EC/COM/2006/0216 final)" and more generally for "strengthening the capacity to mobilize and use biodiversity data, information and forecasts so that they are readily accessible to policymakers, managers, experts and other users" (UNEP/CBD/COP/10/27).

DOPA is conceived as a set of distributed Critical Biodiversity Informatics Infrastructures (databases, web modelling services, broadcasting services, ...) combined with interoperable web services to provide a large variety of end-users including park managers, decision-makers and researchers with means to assess, monitor and possibly forecast the state and pressures on protected areas at local, regional and global scale. Aside the services hosted at the JRC, databases contributing to DOPA are typically The Red List of Threatened Species (IUCN), the World Database of Protected Areas (IUCN and UNEP-WCMC), and the species occurrences provided by the GBIF.

In particular, DOPA aims to

1. provide the best available material (data, indicators, models) agreed on by contributing institutions which can serve for establishing baselines for research and reporting (e.g. Protected Planet Report, National Biodiversity Strategies and Action Plans);
2. provide free analytical tools to support the discovery, access, exchange and execution of web services (databases and modelling) designed to generate the best available material but also for research purposes, decision making and capacity building activities for conservation;
3. provide an interoperable and, as much as possible, open source framework to allow institutions to develop their own means to assess, monitor and forecast the state and pressure of protected areas and help them to further engage with the organizations hosting critical biodiversity informatics infrastructures.

DOPA Explorer (Beta version, 2013: http://ehabitat-wps.jrc.ec.europa.eu/dopa_explorer/) has been developed to provide simple means to explore areas around all marine and terrestrial protected areas that are greater than 150 km², identify those with most unique ecosystems and species, and assess the pressures they are exposed to because of human development. Ecological data derived from near real-time earth observations are also made available although currently limited to African protected areas.

Two other main interfaces to the web services are planned for the period 2014-16: (1) DOPA Validator (2015) will allow registered users to validate/invalidate the information summarized in DOPA Explorer and provide additional observations about individual protected areas; (2) DOPA Analyst (2016) will be providing end-users with a broad range of modelling tools for forecasting climate change impact on protected areas, assessing connectivity, computing niche models or to allow end-users to simulate consequences of adding or removing a protected area on regional indicators.

Reference: Dubois, G, M. Schulz, J. Skøien, A. Cottam, W. Temperley, M. Clerici, E. Drakou, J. van't Klooster, B. Verbeeck, I. Palumbo, P. Derycke, J-F. Pekel, J. Martínez-López, S. Peedell, P. Mayaux (2013). An introduction to the Digital Observatory for Protected Areas (DOPA) and the DOPA Explorer (Beta). EUR 26207 EN, EC. Luxembourg: Publications Office of the European Union 72 p. See more at: <http://dopa.jrc.ec.europa.eu/content/publications-resources#sthash.kYTkHhtQ>

In WA, the severity of conservation problems imposes a strong need for a supranational dialogue. In WA, safeguarding the populations of elephants, the desert ecotype wildlife, the specificities of the rainforests, and the wetlands and mangroves requires greater coordination between countries of the region and greater collaboration between countries and donors on the subject. This collaboration can be achieved firstly by empowering a special unit at the institutional policy level (i.e. WAEMU) and a strong coordination of activities among donors, always to take place through this special unit at institutional level. The creation of a special unit at the institutional level should provide greater awareness in government decision-making. The creation of a coordinated response by donors ensures greater synergy of interventions in financing long-term, specific and emergency interventions (see chapter 5.2.1 for implementation).

5. INDICATIVE CONSERVATION ACTIONS / PRIORITY CONSERVATION NEEDS

Having reviewed the main conservation issues in West Africa, including the status of wildlife in 4 major ecotypes and the nature of direct indirect threats to wildlife, we now move on to consider a strategic approach for the conservation of biodiversity in WA.

The most important points to remember about conservation in WA are the following:

- High biodiversity values in a wide range of ecosystems, but weak funds, management, protection and sustainable development of wildlife and other natural resources;
- Strong direct threats such as loss of habitats and fragmentation, unsustainable poaching, and poor institutional governance with weak monitoring and planning;
- Strong indirect threats such as human population growth and poverty, a weak policy and sectorial approach with unsustainable land and resource use.

This strategic approach focuses on the following key needs:

- A. An active conservation process with more feet on the ground to counter the direct threats and to enhance protection of biodiversity whilst at the same time promoting its high values;
- B. A proactive process with more external support for better governance, monitoring and planning, and in support of actions taken to reduce indirect threats on conservation.

A. Active process

The active process has its own goals: (i) to balance the interventions between the four major ecotypes; (ii) to save threatened species from extinction; (iii) to preserve critical habitats (e.g. wetlands, Mount Nimba, and mangroves); (iv) to improve management effectiveness of national and transborder parks; (v) to promote the initiatives of landscape-based conservation including the maintenance of connections between blocks of PAs; and (vi) to ensure a better awareness and representation of the realities of wildlife in WA.

The active process has five main activities:

1. Dissemination and analysis of the proposals for site conservation and for other conservation priorities in WA;
2. Specific strategies and actions for the major ecotypes: Deserts, Savannas, Forests and Mangroves/Coastal;
3. Dismantling the wildlife trafficking network;
4. Special analyses;
5. Training in wildlife protection.

The objective of the first activity (Dissemination and analysis of...) is to confirm the conservation strategic approach for WA and to refine the details necessary for the implementation of the proposals. The action is scheduled only for the first year.

The second activity (Specific strategies and actions...) entails (i) prioritizing interventions for the most important Key Landscapes for Conservation (KLCs) and Key Areas for Conservation (KACs); (ii) itemizing the main objectives of every single KLC and KCA; and (iii) preparing proposals to prevent the further decline of wetlands and to create new or larger KLCs and KCAs.

For each major ecotype, the process provides priorities of implementation based on criteria related to species, habitats and typologies of conservation (Table 4). The ecotype of mangroves also includes the marine and coastal PAs, but a harmonised and more detailed analysis than could be undertaken here with incorporation of the strategic plan for marine protected areas on the Atlantic coast of Africa as implementation of the Abidjan Convention.

The third activity is part of the active conservation approach with activities on the ground. It will include the following supporting actions:

- Dismantling wildlife trafficking networks in four sub-actions:
 - Political and diplomatic support;
 - Intelligence and security;
 - Judiciary and Conviction of illegal activities on PAs;
 - Security communications.

The fourth activity on special analysis is split into three sub-activities:

- Monitoring and planning of highly threatened species and habitats;
- Population and Habitat Viability Assessment (PHVA);
- Establishing new or larger KLCs and KCAs.

The fifth activity on wildlife protection training will assist in winning back control of the parks and in curbing –poaching. It has three steps:

- Identify conservation sites with the capacity to deliver basic training for new rangers;
- Prepare and implement training programmes targeting the specific needs of each PA;
- Support implementation of the appropriate anti-poaching programmes for each PA.

B. Proactive process

The proactive process attempts to support and boost the active process on a long term basis by creating a unit of “institutional support and coordination” allocated under the WAEMU with the support of a special task force. The establishment of a regional coordination unit should exclude the creation of a new regional entity, but aim for the strengthening an existing regional institution in the specific field of conservation by the introduction of a task force. This proposal recommends strengthening the existing regional institution of WAEMU in the specific field of conservation by a special unit reinforced by a task force of experts.

A unit under the WAEMU will have the mission of coordinating and promoting the following:

- *Monitoring and Planning* in coordination with the Observatory installed by BIOPAMA in West and Central Africa with the duty of organizing and directing the conservation information as a decision-support system at local, national and regional levels;
- *Communication* to increase the awareness of the region for conservation through a far-reaching communication process;
- *Biological Research* that is highly targeted and oriented towards the improvement of management effectiveness on specific aspects of conservation in WA;
- *Management-Governance Training* for raising the capacity of senior level officers of PAs and central government so that they are equipped to adopt the most advanced and suitable techniques for long-term management and conservation of biodiversity in WA.

5.1 ACTIVE PROCESS

5.1.1 Dissemination and analysis of the proposals about sites and conservation priorities in WA

The implementation of inputs and proposals for intervention in the short and medium term requires the transmission of information through regional channels (ECOWAS - WAEMU) in favour of national institutions, NGOs and representatives of stakeholders in conservation. The information is intended to confirm the general conservation strategic approach and refine the details necessary for the implementation of the proposals. The EU should promote the first initiative, but in the future the regional Observatory setup by the BIOPAMA project will support the coordination of the regional and national institutions by its regional reference information system on conservation (see boxes 2 and 3).

This intervention should be carried-out under the coordination of WAEMU.

5.1.2 Support for conservation of the major ecotypes: Deserts, Savannas, Forests and Mangroves/Coastal

The strategic approach to conservation in West Africa is fundamentally based on national parks management. The highly degraded situation and the strong, persistent threats suggest the need for a more structured intervention on conservation based on:

- a) major ecotypes, to extend the interventions of conservation from savannas and forests to the areas that have received less attention in the past such as desert PAs and mangroves and coastal-marine PAs;
- b) species, so as to prevent extinction of the rare and charismatic species (desert antelopes, elephants, primates, carnivores, giraffes, eland, pygmy hippopotamus, birds, plants and amphibians);
- c) habitats, to defend sensitive areas such as the wetlands, the water basin, the inner deltas, and the montane habitats;
- d) Key Landscapes of conservation (KLCs), to allow for better management of habitats and species;
- e) Transborder Conservation Areas (TFCA), through better regional coordination and to act as a symbol of a possible peace process between neighbouring countries;
- f) Key Conservation Areas (KCAs), to guarantee the basic intervention of conservation in support of specific habitats and species.

The strategic approach organises these interventions according to the four major ecotypes to ensure a balance between the different conservation realities of WA and to spread the current strong focus for Savanna protected areas. This strategic approach put more attention to key, rare and endangered species, and special and unique habitats in the KLCs, TFCAs and KCAs.

Consequently the strategic approach will carry out conservation actions on the following:

- A. KLCs of Deserts Major Ecotypes;
- B. KLCs, KCAs and endangered wetlands of Savanna Ecotypes;
- C. Existing KLCs and KCAs and new or larger KLCs and KCAs (in Liberia, Ghana and Nigeria) of the Forest Ecotypes;
- D. KLCs, KCAs and new or larger KLCs and KCAs (in Nigeria, Ivory Coast, Liberia, Sierra Leone, Senegal, Guinea) of Mangroves/Coastal Ecotypes.

Beginning with the Desert ecotype, this strategic approach presents specific proposals for conservation of every site and for each major ecotype. For summarised global data, see Table 27 and Figure 14.

The elements of each site are presented in table format under the following headings:

- Conservation objectives
- Key Species
- Key habitats

The summary elements of each major ecotype are presented in table format under the following headings:

- Protecting biodiversity;
- Countries;
- Biomes / Ecotypes;

- Main Protected Areas and priorities;
- Analysis;
- Objectives and Proposed actions;

5.1.3 Specific strategies and actions for the major Desert ecotypes

The habitats of the Desert ecotype are heavily influenced by drought. So in the most arid zones, degradation is found where water (oases, etc.) is present. Otherwise the Sahara is a vast area of largely undisturbed habitat. The areas of steppe and woodlands in the desert are also heavily influenced by drought and the effects are exacerbated by large numbers of domestic livestock.

The desert areas of the Atlantic coast are severely degraded (overgrazing, cutting of trees for firewood and timber, and soil erosion aggravated by drought are contributing to desertification). The chief faunal values are along the coast where key migratory staging posts for the birds using the Atlantic Coastal Flyway are found. The large mammal species have suffered from uncontrolled hunting but the coast also supports the world's largest population of the critically endangered Mediterranean monk seal (*Monachus monachus*).

It is recommended that the highest priority be given to key landscapes of conservation and key protected areas in the following ecotypes:

- Desert with the ecotypes of Sahara Desert; South Saharan steppe and woodlands and West Saharan montane xeric woodlands;
- Atlantic coast.

For summarised global data: see table 8 and figure 10.

The proposal for the WA Desert ecotype is to establish one large Desert Key Landscape of Conservation.

Niger-Chad-Algeria Desert KLC (416,750 km² of PAs)

The conservation field activities should focus on the area between the Niger, Chad and Algeria where there are probably the only remaining PAs that contain populations of many of the larger ungulates of this ecotype. However, this vast area has long been plagued by political insecurity and civil unrest, and the current situation of the desert wildlife is far from certain.

Many desert species track seasonally variable and patchy resources and require large natural landscapes to persist. Consequently, and if necessary, *in-situ* conservation should cover the entire area between the priority PAs. Special habitats to protect are the water sources and riparian habitats which are critical for the persistence of many desert species. For this reason, agreements between countries should be defined to determine a common intervention strategic approach at the regional level.

The Desert KLCs encompass 3 PAs of Niger [(1) 97,000 km² Termit & Tin Toumma – (2) 78,339 km² Air and Ténéré – (3) 12,754 km² Addax Sanctuary], 2 PAs of Chad [(4) 83,000 km² Ouadi Rimé-Ouadi – (5) 1,739 km² Fada Archei] and 2 PAs of Algeria [(6) 98,900 km² Tassili-n-Ajjer – (7) 45,000 km² Ahaggar].

The key threats to be addressed are the reduction of large mammal populations and the Saharan cheetah and the poorness of the genetic heritage of the desert antelopes. The large spaces and the system resilience, despite climate change, argue for adopting these measures:

- (i) species approach, together with a
- (ii) combined *in-situ* and *ex-situ* conservation approach to protect the endangered species in the priority PAs (see below) and to preserve and improve the genetic heritage of desert antelopes with *ex-situ* conservation.

To have the greatest probability of conservation success, *in situ* and *ex-situ* conservation techniques should be applied synergistically and must:

- be flexible to act in areas and countries as soon as security conditions allow it;
- save the habitat in which the species can live and reproduce (PAs and ecosystem);
- preserve and improve the genetic heritage (DNA¹²), under the responsibility of WAZA¹³, with a view to the possible reintroduction of species in their natural habitat. Care must be taken to ensure that the natural habitat is preserved until reintroduction can take place (see Table 5).

Table 5. Key elements of the Niger-Chad-Algeria Desert KLC

Elements	Priority elements
KLC	Key Landscape for Conservation in the desert ecotype between Niger, Chad and Algeria
Conservation objectives	1. Protection of desert and semi-desert habitats and desert antelopes
Key Species	– Scimitar Oryx ; Saharan cheetah ; Dama Gazelle ; Addax
Key habitats	– Water sources and riparian habitats which are critical for the survival of many species

The proposal for the Atlantic coast is to establish two KLCs as follows.

Senegal-Mauritania-WL1 Atlantic Coastal KLC (2,465 km² of PAs)

This landscape includes: (1) the contiguous 659 km² Diawling NP in Mauritania, (2) the 209 km² Parc National des Oiseaux du Djoudj and (3) the nearby 461 km² Saint-Louis Marine protected area, (4) the 486 km² Ndiael Wildlife Reserve and (5) the 650 km² Forêt de Keur Momar Sarr in Senegal.

This complex contains the most important wetlands in WA (WL1 in Figure 10) and consists of lagoons, saline flats and a small area of mangroves, as well as dunes, alluvial plains and an interconnecting network of rivers lakes and ponds. There are seasonally inundated and marshy areas with small channels, especially adjacent to the river, and some of these are extremely important for birds in some years or at certain times of year, depending on flood and rain water-levels. The PAs and the buffer areas are incorporated in sites classified as IBAs (Table 6).

Table 6. Key elements of the Senegal-Mauritania Atlantic Coastal KLC

Approach	Priority elements
KLC	Atlantic coast key landscape of conservation between Mauritania and Senegal

¹² DNA, Deoxyribonucleic acid (DNA) is a molecule that encodes the genetic instructions used in the development and functioning of all known living organisms and many viruses

¹³ WAZA, World Association of Zoos and Aquariums

Conservation objectives	<ol style="list-style-type: none"> 1. Conservation, restoring and monitoring the sites and habitats 2. Promote resilient ecological transborder networks 3. Protection for the wintering Western Palearctic waders
Key Species	– Over two million wintering Western Palearctic waders, from fifteen different species
Key habitats	– Inland delta in a shallow depression lying within the flood-plain of the Senegal River

Mauritania – Western Sahara Atlantic Coastal KLC (33,850 km² of PAs)

This landscape encompasses (1) the 11,876 km² Banc d'Arguin National Park and (2) the 3,100 km² Réserve Intégrale de Cap Blanc in Mauritania and (3) the 18,888 km² Dakhla National Park (split into two distinct sectors: coastal and inland) in Western Sahara. The Presqu'île du Cap Blanc, that supports the world's largest population of the critically endangered Mediterranean monk seal, is protected by the Dakhla National Park (Western Sahara) and the contiguous Réserve Intégrale de Cap Blanc (Mauritania).

The marine part of the national parks include shallow open sea and seagrass beds, intertidal flats, channels and creeks, clumps of mangrove, as well as coastal desert habitats. Adjacent to the Mauritanian park lays one of the world's richest fishing grounds. The terrestrial part of the PAs includes areas of Saharan vegetation and a much larger inland desert sector for the Dakhla National Park.

The landscape hosts one of the world's most diversified communities of nesting piscivorous birds in the world (Hoffmann, 1988). At least 108 bird species have been recorded, representing both Palaearctic and Afrotropical realms. The number of wintering shorebirds is estimated to be over three million (Table 7).

Table 7. Key elements of the Mauritania – Western Sahara Atlantic Coastal KLC

Approach	Priority elements
KLC	Atlantic coast key landscape of conservation between Mauritania and Western Sahara
Conservation objectives	<ol style="list-style-type: none"> 1. Conservation, restoring and monitoring the sites and habitats 2. Protection for one of the world's most diversified communities of nesting piscivorous birds in the world 3. Prevent bird and Mediterranean monk seal extinctions 4. Promote resilient ecological transborder networks
Key Species	<ul style="list-style-type: none"> – Over three million wintering shorebirds – At least 108 bird species of nesting piscivorous birds – The critically endangered Mediterranean monk seal
Key habitats	– Shallow open sea, coastal desert habitats, clumps of mangrove

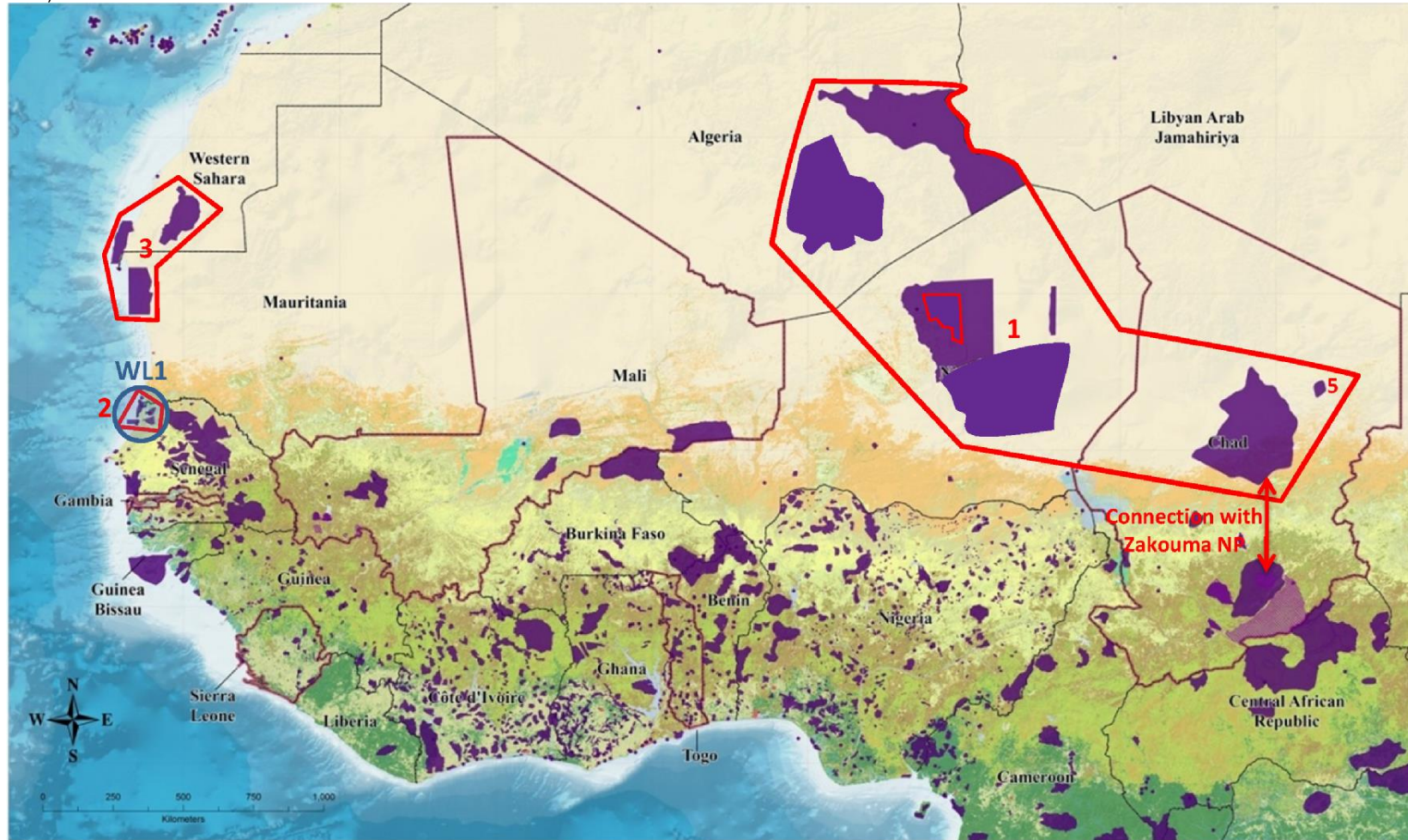
Table 8. A - West Africa Deserts – Key Landscape of Conservation and priorities

Protecting biodiversity	Countries	Biome / Ecotype / Key species	Main KLCs and KPAs and priorities	Analysis	Objectives and Proposed actions
<ul style="list-style-type: none"> - Under-representation of the desert and semi-desert habitats in PAs poses a threat to their long-term stability and conservation - Important Saharan large mammals but globally threatened - Immense importance for over two million wintering Western Palearctic waders, from fifteen different species (Atlantic coastal desert) - Extraordinarily rich floras despite the very low and variable rainfall - Diversity of reptiles is moderately high (around 100 species) - Small number of endemics, but local endemism may be quite pronounced in some regions - Many species track seasonally variable and patchy resources and require large natural landscapes to persist - Water sources and riparian habitats are critical for the persistence of many species 	WA <ul style="list-style-type: none"> - Mali - Mauritania - Niger - Senegal 	Biome: Deserts and xeric shrubland Ecotype: <ul style="list-style-type: none"> - Sahara desert - South Saharan steppe and woodlands - Atlantic coastal desert - West Saharan montane xeric woodlands Other ecotypes of the biome: <ul style="list-style-type: none"> - East Saharan montane xeric woodlands - Tibesti-Jebel Uweinat montane xeric woodlands Key species and status: <ul style="list-style-type: none"> Scimitar Oryx ▼▼▼ Saharan cheetah ▼▼▼ Dama Gazelle ▼▼ Addax ▼▼ Dorcas Gazelle ▼ Afrotropical-Palaeartic an ▼ piscivorous birds 	Key Landscape of Conservation 1. Niger-Chad-Algeria (NCA) Desert Landscape of Conservation (416,750 km ² of PAs) <i>Termit & Tin Toumma – Air and Ténéré – Addax Sanctuary in Niger; Ouadi Rimé-Ouadi – Fada Archei in Chad and Tassili-n-Ajjer – Ahaggar NP in Algeria</i> 2. Senegal-Mauritania-WL1 (SMWL1) Atlantic Coastal Desert Landscape of Conservation and Wetlands (2,465 km ² of PAs) <i>Diawling NP in Mauritania, Parc National des Oiseaux du Djoudj, Saint-Louis Marine protected area, Ndiel Wildlife Reserve and Forêt de Keur Momar Sarr in Senegal</i> 3. Mauritania – Western Sahara (MWS) Atlantic Coastal Desert Landscape of Conservation (33,850 km ² of PAs) <i>Banc d'Arguin NP and Réserve Intégrale de Cap Blanc in Mauritania and Dakhla National Park in Western Sahara</i>	Negative aspects <ul style="list-style-type: none"> - Degraded habitat: overgrazing, cutting of trees, dry and intensive land use for agriculture - Motorized hunting - Local poaching - Political insecurity and civil unrest - Under-representation of the desert and semi-desert habitats of these ecotypes - Threat to long-term stability and conservation of PA - Genetic heritage of desert antelopes - Insufficient funds - Poverty - Disadvantaged population Positive aspects <ul style="list-style-type: none"> + Surface (about 25% of Africa) + Extraordinary ecosystem and fauna + Cultural heritage + Potential tourism 	Objectives <ol style="list-style-type: none"> 1. Protection of desert and semi-desert habitats and desert antelopes 2. Conservation, restoring and monitoring the sites and habitats 3. Protection for the wintering Western Palearctic waders and one of the world's most diversified communities of nesting piscivorous birds in the world Actions <ul style="list-style-type: none"> - Promote resilient ecological transborder networks - <i>In-situ</i> conservation for the entire biome (coordination / responsibility of one or more international organizations specializing in conservation in desert areas or a partnership between them) - Prevent extinctions (also for the birds) and preserve the genetic heritage (DNA) - Promote resilient ecological transborder networks - Monitor and strengthen national ex-situ conservation - Improving the genetics of desert antelopes in-situ and ex-situ conservation (responsibility of WAZA) - Constant support by the IUCN/SSC Antelope Specialist Group (ASG), Northeast African Subgroup IUCN and Birdlife International - ICDP on the principles of good governance (Legitimacy & voice, Direction, Performance, Accountability, Fairness) - Exploitation of every possibility in land surveys (military) for better protection (and knowledge) of wildlife. - Possible future reintroduction of the species back into its natural habitat (while ensuring that the natural habitat remains intact)

Note: Red arrows denote declines in status, green arrows denote species recoveries

Figure 10. A - West Africa Deserts – Key Landscape of Conservation and priorities

(1) Niger-Chad-Algeria Desert Landscape of Conservation (416,750 Km² of PAs); (2) Senegal-Mauritania Atlantic Coastal Desert Landscape of Conservation (2,465 Km² of PAs); (3) Mauritania – Western Sahara Atlantic Coastal Desert Landscape of Conservation (33,850 Km² of PAs). The WL Number (WL1) indicates the priority of intervention for wetland conservation. (map: Climate Change and Protected Areas in West Africa – CCPAWA, United Nations Environment Programme World Conservation Monitoring Centre, 2010; specific elaboration)



5.1.4 Specific strategies and actions for the major Savanna ecotypes

The original savannas of WA have been greatly reduced, degraded and fragmented by farming, grazing, cutting and burning trees and bushes for wood and charcoal. The degradation is exacerbated in areas of high human population density such as Nigeria (up to 300 persons/km²). Also the interlacing forests and savanna areas, with their critical habitat for a number of large charismatic mammals, are highly degraded and the PAs preserve only two percent of the forest-savanna mosaic. The periodic droughts are further threats, exacerbating human pressures on biodiversity. The remaining blocks of intact habitat are found mainly in the protected areas, but most are under-resourced and even within the better-managed protected areas poaching is still rife and predators are systematically poisoned by transhumant herders. Most of the populations of larger mammal species have been decimated by over-hunting. West African populations of elephant are small, but of great conservation interest and draw attention to the value of the protected areas. Roan antelope and West African savanna buffalo are relatively more numerous but restricted to protected areas. Species that are at risk of extinction include giant eland, waterbuck, west African giraffe, wild dog, lion, leopard and cheetah.

The lions of WA are a particular concern. Dr. Philipp Henschel of the NGO Pantera's explained:

"When we set out in 2006 to survey all the lions of West Africa, the best reports suggested they still survived in 21 protected areas. (In 2013) We surveyed all of them, representing the best remaining lion habitat in West Africa. Our results came as a complete shock; all but a few of the areas we surveyed were basically paper parks, having neither management budgets nor patrol staff, and had lost all their lions and other iconic large mammals."

Bird species are also declining. The annual passage in the area of the huge numbers of migrant birds (Afrotropical-Palaearctic and intra-African migration) is particularly threatened by drought, overgrazing in the Sahel, and by the drainage and pollution of WA wetlands (Box 4).

The most important PAs in the WA savannas include: the 'W' trans-border park between Benin, Burkina Faso and Niger, Pendjari NP in Benin, Arly NP in Burkina Faso, Comoe NP in Côte d'Ivoire, River Gambia in Gambia, Mole NP in Ghana, Boucle du Baoulé NP and Gourma Elephants in Mali, Kainji Lake and Yankari NP in Nigeria and Niokolo-Koba NP in Senegal.

Finally, threats to the conservation of biodiversity on WA savannas are: (i) the degraded and fragmented ecosystems; (ii) the high poaching levels and the high extinction risk for large mammals species; (iii) the highly vulnerability of the area to climate change exacerbating desertification and degradation of agricultural systems, with knock-on effects for PAs. The intervention strategic approach requires:

- (i) concentrating conservation actions on the WAP¹⁴ transborder area, the only functional ecological complex to maintain biodiversity in WA savannas;
- (ii) preserving the most important ecological blocks of PAs (even if faunal densities are low), and the corridors between them for possible future rehabilitation;
- (iii) determining the most appropriate conservation actions for threatened species (*in-situ* and *ex-situ* conservation, special conservation, translocation, etc.) by the establishment of PHVA¹⁵ analysis if necessary, and the preservation of specific habitats especially wetland areas for birds.

The West Africa Economic and Monetary Union (WAEMU), with the support of experts in West Africa savanna management, has proposed interventions which are summarized and integrated with other proposals in the following key points:

- Establish a convergence plan of interventions on conservation in the ecotypes;
- Save the WAP ecosystem (W - Arly - Pendjari), the only functional ecological complex to have a potential serve as a site for regeneration and reintroduction of species back into the other degraded AP in the savanna ecotype;

¹⁴ The strategy must prioritize the intervention in the WAP complex (W, Arly and Pendjari) and less in the Togo complex of Keran-Oti-Monduri in reason of the high level of degradation and the resources needed to restore the protected areas of Togo

¹⁵ Population and Habitat Viability Assessment

- Preserve the most important ecological blocks of protected areas: (1) W - Arly - Pendjari - Oti Monduri (Benin, Burkina Faso, Niger and Togo); (2) Comoé – Mole (Côte d'Ivoire and Ghana); (3) Niokolo - Badiar - Bafing – Faleme –Fouta Djallon (Guinea, Mali, Senegal) and (4) Gourma Elephant and Sahel Faunal Reserve (Mali and Burkina Faso), even though faunal densities may be low;
- Support transborder complexes of protected areas and special conservation measures (cross border activities) in the major Savanna ecotypes in West Africa such as the WAPOK;
- Implement new management initiatives such as the proposal to establish trans-border corridors between major ecological blocks, as for the Volta Trans-Border Ecosystem Wildlife Corridors between Burkina Faso and Ghana.

Summarized global data are presented in Table 15 and Figure 11.

Box 4. The decline of wetlands

THE DECLINE OF WETLANDS

(from Zwarts, L. et al (2009). Summary of Living on the Edge: Wetlands and Birds in a Changing Sahel. KNNV Publishing, Zeist, The Netherlands)

The Palearctic-African bird migration draws birds from the geographical range between 10° W (Ireland) and 164° E (Kolyma Basin, northeastern Siberia). Long distant migrants from this vast region pour into sub-Saharan Africa, amassing mainly in the northern savannas of the Sahel and Sudan-Guinea zone. Although the region is close to the Sahara it has four huge Sahelian Wetlands: the Senegal Delta, the Inner Niger Delta, the Lake Chad and the Hadejia-Nguru wetlands. These wetlands are of critical importance to the migrating waterbirds.

Senegal Delta (WL1 in the figure 10 and 14)

The Senegal Delta has a unique ecosystem because sea water can enter the floodplains, hence the gradient from marine to fresh. In the past in an area of 3400 km² the water level varied by 3.5 m. At present the floodplains were turned into irrigated farmland and the permanent water body have invasive plant species (Water Lettuce, Kariba Weed) and has reduced the level to 0.5 m. The bird life reduced dramatically. No wetland in West Africa has changed to the extent as the Senegal Delta. Some of the ecological disasters associated with the loss of the floodplains were offset by the creation of Djoudj NP (Senegal) and Diawling NP (Mauritania). Both sites are now important wetlands for migratory bird species. (For conservation measures, see chapter 5.1.3).

Inner Niger Delta (WL2 in the figure 11 and 14)

The Inner Niger Delta in Mali is huge. The area covered by water at any one time could amounts to 25,000 km² but in most years the areas of floodplains are smaller. The Inner Niger Delta stands out also for its hydrological dynamics. The water could rise by more than 6 m in wet years, but in extremely dry years the flood level rises only by 3 m. For waterbirds the large annual differences in flood extent are a matter of life and death (starvation or preying). Dams in the Niger upstream of the Delta and large irrigation works and breeding (as in the Senegal Delta) take so much water that the floodplains are now reducing up to an estimated 15-20% of the total. The drier the Inner Niger Delta the fewer migrants survive the northern winter. For few species, the population in the Inner Niger Delta constitute a substantial part of the entire population. The significance of this area for European and Asia migrants can hardly be overestimated. (For conservation measures, see chapter 5.1.4).

Lake Chad Basin (WL3 in the figures 11 and 14)

In the past Lake Chad was very large, varying in size between 15,000 and 25,000 km², at present the decline of the water level is important due to irrigation along the Logone and Chari Rivers and the climate change. All in all, birdlife in Lake Chad must have changed a lot, but hard data are lacking. So although Lake Chad was reduced in size, the floodplains increased in size, which spells good news for foraging birds. The complete bird counts reveal the Lake Chad significance for local species, but also for migrants. (This area has not covered by direct conservation measure, but it should be supported by the special fund for new or larger KLCs and KCAs in savanna areas).

Hadejia-Nguru wetlands (WL4 in the figures 11 and 14)

The Hadejia-Nguru wetlands lie on the southern edge of the Sahel savanna in north-eastern Nigeria. The area is a flood-plain complex, comprised of a mixture of seasonally flooded lands and dry uplands. There are 20 dams upstream of the Hadejia-Nguru and the size of the floodplains varies annually, depending on the river discharge, between 300 and 3600 km². Large parts of the wetland are under rice cultivation during the rainy season and, during the dry season, are usually utilized for growing other crops as water-levels drop. Uncultivated areas are grazed by livestock. The bird counts, performed between 1988 and 1998, show that numbers are related to the size of the floodplains: 300,000 waterbirds were counted in wet years, but only 50,000 in dry years. (This area has not covered by direct conservation measure, but it should be supported by the special fund for new or larger KLCs and KCAs in savanna areas).

It is recommended that the highest priority be given to the following key landscapes of conservation and key conservation areas.

WAPOK Savanna KLC (38,000 km² of PAs)

This large complex of contiguous conservation areas is located near to the international frontiers with Burkina Faso, Benin, Niger and Togo. The landscape encompasses (1) the 10,400 km² W transborder park between Benin, Burkina Faso and Niger; (2) the 1,823 km² Pendjari NP in Benin; (3) the 839 km² Arly Faunal Reserve (named Park) in Burkina Faso; (4) the 1,450 km² Oti Monduri Faunal Reserve and (5) the 1,196 km² Keran NP in Togo. The WAPOK complex includes one Giraffe area not classified in Niger, 10 hunting concessions and many adjacent village hunting zones.

The WAPOK complex is a large area about 38,000 km² of intact habitat (with the exclusion of Togo's PAs) with great importance for the survival of large mammals including lion and other species that are at high risk of extinction in WA. These different blocks constitute the largest remaining wilderness and the only functional ecological complex in WA. The complex has the potential to serve as a site for regeneration and reintroduction of species back into other degraded PAs in the savanna ecotype. The survival of the WAP complex is the highest priority in WA.

This strategic approach prioritises and stresses the intervention in the WAP complex (W, Arly and Pendjari and their faunal reserves). It also emphasizes the Togo complex of Keran- Oti-Monduri but recognizes the high level of degradation of the PAs of Togo and the greater resources needed for their restoration (Table 9).

Table 9. Key elements of the WAPOK Savanna KLC

Approach	Priority elements
KLC	Priority savanna KLC located near to the frontiers between Burkina Faso, Benin, Niger and Togo
Conservation objectives	<ol style="list-style-type: none"> 1. Preserving the only functional savanna ecological complex in WA 2. Saving the potential for regeneration and reintroduction of species back into the other degraded PAs in the savanna ecotype 3. Determining the most appropriate conservation actions for threatened species 4. Preservation of specific habitats especially wetland areas for birds.
Key Species	<ul style="list-style-type: none"> – Lion, Cheetah, Elephant, Giraffe, Leopard, Manatee, Roan antelope, Buffalo, and Defassa Waterbuck – Fishes in refuge area of the Niger and Volta Basins
Key habitats	<ul style="list-style-type: none"> – Savanna and dry forest areas – Extensive network of rivers, drainage lines and flood-plains (the rivers and many of the smaller rivers and ponds dry completely by the end of the dry season) – Floodplains and gallery forest – The geological formation of La Falaise de Gobnangou and also a number of isolated inselbergs.

Comoé – Mole (CM) Savanna KLC (16,571 km² of PAs)

This large ecosystem is located on the frontier between the Côte d'Ivoire and Ghana. The two PAs are situated near the borders between the two countries, but they are not contiguous.

The landscape encompasses (1) the 11,671 km² Comoé NP (the largest PA in the savannas of WA) and (2) the 4,900 km² Mole NP in Ghana.

The CM savanna KLC is characterised by savanna woodlands, which cover almost the totality of the parks, and the riparian forests that fringe the rivers. Isolated forest patches of varying size occur throughout the savanna. Other habitat-types include alluvial plains and flat seasonal marsh.

The Comoé NP is high degraded, but it must be preserved, even though faunal densities are low, in the expectation and hope of a better future for conservation in Côte d'Ivoire after the recent civil wars and violence. The initiative will also serve to support cross-border activities and establish trans-border corridors between major ecological blocks in order to save the large populations of mammal and the threatened species in WA (Table 10).

Table 10. Key elements of the Comoé – Mole (CM) Savanna KLC

Approach	Priority elements
KLC	Savanna KLC located close to the frontiers between Côte d'Ivoire and Ghana
Conservation objectives	<ol style="list-style-type: none"> 1. Preserve the savanna ecological blocks and the corridors between them for possible future rehabilitation 2. Adopt the most appropriate conservation actions for threatened species 3. Preservation of specific habitats especially wetland areas for birds.
Key Species	<ul style="list-style-type: none"> – Elephant, Leopard, Roan antelope, Buffalo
Key habitats	<ul style="list-style-type: none"> – Extensive network of rivers – Savanna woodlands – Forest patches and gallery forest – Alluvial plains and flat seasonal marsh

Niokolo - Badiar - Bafing – Baoulé - Falémé – Fouta (NBBBF) Savanna KLC (about 25,000 km² of PAs)

This large complex of noncontiguous conservation areas is located between Guinea, Senegal, and Mali.

The landscape encompasses (1) the 8,423 km² Niokolo NP in Senegal; (2) the contiguous 278 km² Badiar NP in Guinea; (3) the 1,600 km² Bafing NP and (4) the 3,935 km² Boucle du Baoulé NP in Mali. The complex includes the Faleme area (Mali and Guinea) and two Chimpanzee areas, one in Mali (Bafing) and the other in Guinea (Fouta Djallon,) and more than 9 hunting zones.

The complex is largely flat with large areas of floodplain and marsh, inundated during the seasonal rains (June to October). The area includes low hills and rugged and broken terrains, especially in the west where there are spectacular escarpments. The area is crossed by large rivers that dried during the dry season, but the waters of the artificial lake form the eastern

boundary of the Bafing NP for much of its length. The vegetation includes herbaceous savanna dominated by *Andropogon gayanus* in the valleys and plains, dry forest and gallery forest and more luxuriant vegetation along watercourses.

There is a proposal for the creation of a 38,000 km² Bafing-Falémé Trans-border Protected Area (BFTPA), which will be very important both in terms of biodiversity and regional water security. With a mean population density of just 10 people/km², one of the lowest in the region south of the Sahel, the BFTPA is considered one of West Africa's last wild places. The stability of its unique ecosystems is now threatened by roads construction, mining, and a growing demand for arable land, energy, wildlife products, and other scarce resources (Table 11).

Table 11. Key elements of the Niokolo - Badiar - Bafing – Baoulé - Falémé – Fouta (NBBBFF) Savanna KLC

Approach	Priority elements
KLC	Savanna KLC located to the frontiers between Guinea, Mali, and Senegal
Conservation objectives	<ol style="list-style-type: none"> 1. Preserve the savannas ecological blocks and the corridors between them for possible future rehabilitation 2. Adopt the most appropriate conservation actions for threatened species 3. Preservation of specific habitats especially wetland areas for birds
Key Species	– Lion, Wild dog (Niokolo Koba), Eland (the last population in WA), Chimpanzee (the furthestmost north population in Africa), Leopard, Roan antelope, Buffalo
Key habitats	<ul style="list-style-type: none"> – Largely flat with large areas of floodplain and marsh, inundated during the seasonal rains – Low hills and spectacular escarpments in the west – Large rivers and an artificial lake form the eastern boundary of the Bafing NP

Gourma Elephant, Sahel Faunal Reserve and Inner Niger Delta (WL2) Savanna KLC (26,500 km² of PAs)

This large complex of conservation areas is located between the frontier of Mali - Burkina Faso and the Inner Niger Delta, but there are not contiguous PAs. The landscape encompasses (1) the 5,715 km² Gourma Elephant in Mali, (2) the 18,150 km² Sahel Faunal Reserve in Burkina Faso and the 2,560 km² of five Important Bird Areas (IBAs) in the Inner Niger Delta (see figure 16). Tombouctou is the biggest IBA, immediately north of the town.

The savanna ecosystem, that include also the seasonal lakes and wetlands of the Sahel Faunal Reserve in Burkina Faso, is home of the furthestmost northerly Elephant population in Africa. The complex houses a large numbers of birds including hundreds of thousands of wintering birds and breeding colonies of cormorant, heron, spoonbill, ibis and other waterbirds (Table 12).

The habitats are characterized by wetlands, sand dunes, semi-desert grasslands, open eroded shields, drainage lines, inselbergs rising out of the plains and a series of hills. On the seasonal floodplain there is a rich plant community providing important dry season grazing. The IBAs in the Inner Niger Delta consist of permanent and semi-permanent wetlands sometimes connected between them. Depending entirely upon the annual run-off from the rains of July to September, the lake levels vary considerably from year to year. Some lakes are ringed by important stands of trees. Under natural conditions, the wetlands retain flood water from the Niger throughout the dry season in years of good rainfall, but otherwise have dried out completely by April. The sites include cultivation and scrub woodland along the course of the Niger and its tributaries, fixed dunes and ephemeral interdunal slacks. The most important areas for waterbirds are thought to be the clusters of dry season shallow ponds.

Table 12. Key elements of the Gourma Elephant, Sahel Faunal Reserve and Inner Niger Delta Savanna KLC

Approach	Priority elements
KLC	KLC with savanna and wetland areas for birds located at the frontiers between Mali and Burkina Faso
Conservation objectives	<ol style="list-style-type: none"> 1. Preserve the savanna ecological blocks and the corridors between them for possible future rehabilitation 2. Preserve other specific habitats especially wetland areas for birds 3. Adopt the most appropriate conservation actions for threatened species (Elephant, Manatee, wetland birds)
Key Species	– Elephant (furthest north population in Africa), Manatee, wetland birds (Afrotropical resident species and migrants)
Key habitats	<ul style="list-style-type: none"> – Extensive network of rivers, seasonal lakes and wetlands – Seasonal floodplains – Clusters of dry season shallow ponds

Lion Key Conservation Areas (8,200 km² of PAs)

Recent surveys (8th January 2014) have suggested that the African lion population is facing extinction across the entire West African region¹⁶.

The team discovered that West African lions now survive only in the trans-border WAP complex (fewer than 200 lions) and in 3 national parks: Niokolo Koba NP in Senegal (fewer than 10 lions), Kainii Lake NP (fewer than 20 lions) and Yankari NP (fewer than 5 lions) in Nigeria (see chapter 6.1.4 in annexes). Counting lions is extremely difficult, and we may never know precisely how many lions there are in West Africa, especially if few specialists suppose that we can find lions outside the PAs.

The strategic approach for the protection of savanna fauna of WA includes: (1) the 5,824 km² Kainii Lake NP (and the Wari - Maro - Mont Kouffe - Agoua Forest in central Benin, to explore) and (2) the 2,387 km² Yankari NP with the main objective of contribution to save the last lions and wild dogs (in Kainii Lake NP) of WA (Table 13).

Table 13. Key elements of the Lion Key Conservation Areas

Approach	Priority elements
KCAs	Protected areas with the last lions of WA
Conservation objectives	<ol style="list-style-type: none"> 1. Adopt the most appropriate conservation actions for lion and the others threatened species 2. Preservation of wetland areas for birds
Key Species	– Lion, wild dog (Kainii Lake NP) and populations of IBA trigger species
Key habitats	<ul style="list-style-type: none"> – Dry savanna woodlands – Riparian vegetation – The only place in Nigeria with Monodominant stands of <i>Pteleopsis habeensis</i>

Volta Trans-Border Ecosystem Wildlife Corridors KLC (3,700 km² of PAs)

The Volta Trans-Border Ecosystem Wildlife Corridors is a new management initiative for the boundary ecosystem between Burkina Faso and Ghana.

The complex is centred on the "Forêt classée and Ranch de Gibier de Nazinga". The Volta Trans-Border Wildlife Ecosystem could represent a continuum between the WAPOK complex and the Comoé-Mole complex. The corridor encompasses (1) the 913 km² Ranch Nazinga and the 2,760 km² of other PAs and hunting zones surrounding Nazinga for a total of about 3,700 km². All the most important PAs and the Ranch Nazinga are classified as Important Bird Areas (see table 14).

Table 14. Key elements of the Volta Trans-Border Ecosystem Wildlife Corridors KLC

Approach	Priority elements
KLC	Savanna KLC located close to the frontiers between Burkina Faso and Ghana
Conservation objectives	<ol style="list-style-type: none"> 1. Preserving the most important corridors between ecological blocks of the savanna of WA 2. Determining the most appropriate conservation actions for threatened species and particularly for Elephant

¹⁶ The lion in West Africa is critically endangered, Panthera's Lion Program Survey, Dr. Philipp Henschel, PLOS ONE, 2014

Approach	Priority elements
	3. Preservation of specific habitats especially wetland areas for birds
Key Species	– Elephant and populations of IBA trigger species
Key habitats	– Typical southern Sudan/Guinea savanna with shrub savanna, tree-savanna and gallery forests

New or larger national protected areas should be created also to stop the decline of Wetlands

Evaluate about 1,000 – 3,000 km² of savanna wetlands for new or larger PAs that can serve to avoid the decline of wetlands (addition of +1-2% of new or larger national PAs than existing KLCs and KCAs as considered by the strategic approach for the specific Savanna ecotype) (Figure 11).

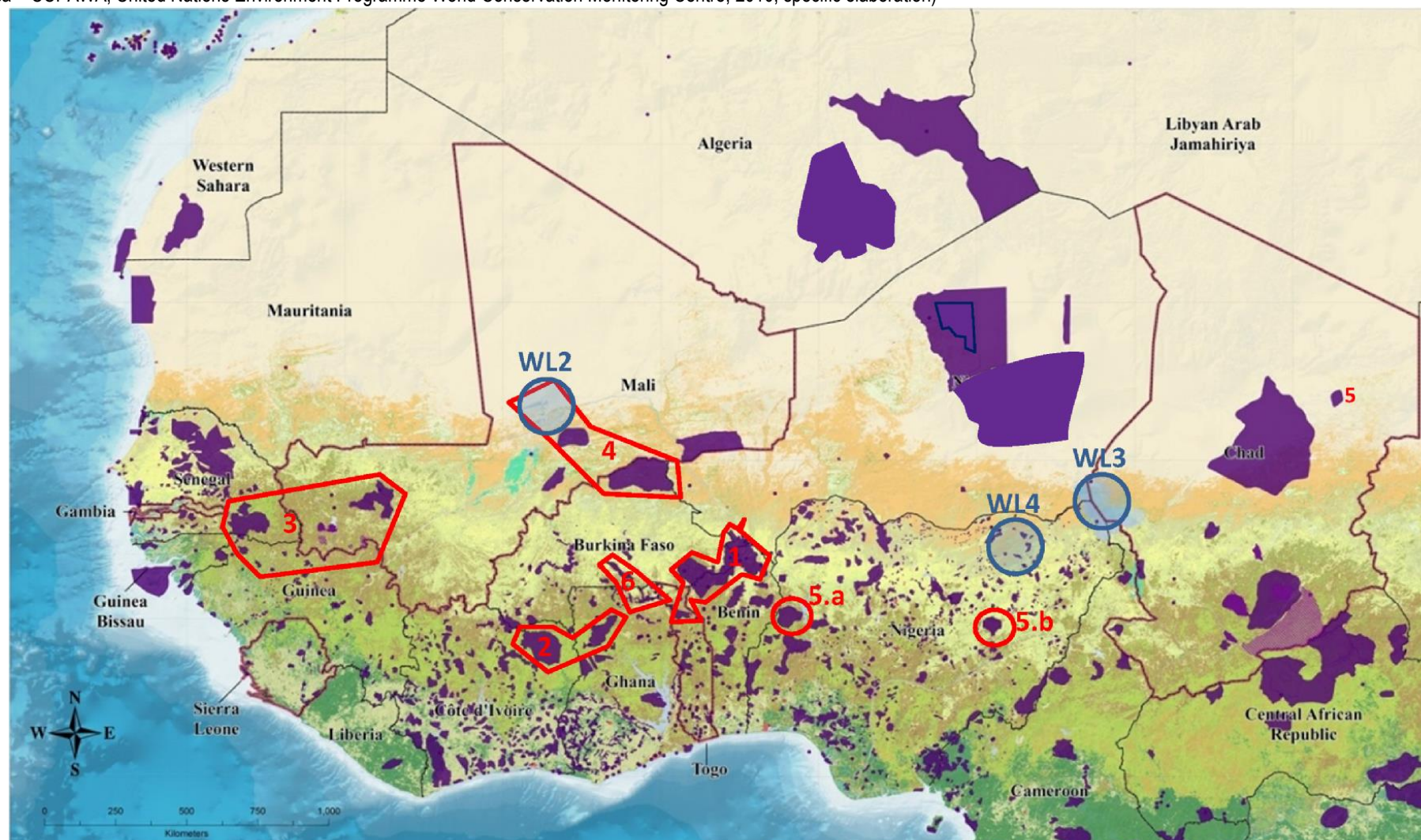
Table 15. B - West African Savannas - Main Key Landscapes of Conservation and Key Conservation Areas and priorities

Protecting biodiversity	Countries	Biome / Ecotypes / Key species	Main KLCs and KPAs and priorities	Analysis	Objectives and Proposed actions
<ul style="list-style-type: none"> - Under-representation of the savanna areas and particularly of interlacing forests and savanna areas in PAs - Large mammal species threatened with extinction: giant eland, wild dog, lion, cheetah and leopard - West Africa lion population estimated at only 250 adults restricted to four isolated PAs. The WAP alone has fewer than 200 lions. - Highly fragmented elephant population with the only large group being in the WAP complex. - Last population of western giraffe (340 animals). - Huge numbers of migrant birds: Afrotropical-Palaeartic and intra-African migration. - Roan antelope and West African savanna buffalo occur in relatively large numbers. - High level of plant endemism. - Large mammals are amongst the most beautiful in Africa, such as the giant eland, roan antelope and major hartebeest - West African lions have unique genetic sequences not found in any other lions, including in zoos or other captivity. 	<ul style="list-style-type: none"> - Benin - Burkina - Côte d'Ivoire - Gambia - Ghana - Guinea - Guinea Bissau - Liberia - Mali - Mauritania - Niger - Nigeria - Senegal - Sierra Leone - Togo 	<p>Biome:</p> <ul style="list-style-type: none"> - Tropical and subtropical grasslands, savanna and shrublands - Montane Grasslands and Shrublands <p>Ecotype:</p> <ul style="list-style-type: none"> - Sahelian Acacia savanna - West Sudanian savanna - Guinean forest-savanna mosaic - Jos Plateau forest-grassland mosaic (without PAs) <p>Key species and status:</p> <ul style="list-style-type: none"> Lion ▼▼▼ Wild dog ▼▼▼ Cheetah ▼▼▼ Leopard ▼▼▼ Giant eland ▼▼▼ Manatee ▼▼ Elephant ▼ Afrotropical-Palaeartic and intra-African migratory birds ▼ Chimpanzee = Giraffe ▲ Roan antelope ▲ Buffalo ▲▲ 	<p>Key Landscape of Conservation</p> <ol style="list-style-type: none"> 1. WAPOK Savannas Landscape of Conservation (38,000 km² of PAs) <i>W transborder park, Pendjari NP, Arly FR, Oti Monduri FR and Keran NP</i> 2. Comoé – Mole (CM) Savannas Landscape of Conservation (16,571 km² of PAs) <i>Comoé NP and Mole NP</i> 3. Niokolo - Badiar - Bafing – Baoulé - Falémé – Fouta (NBBBFF) Savannas Landscape of Conservation (25,000 km² of PAs) <i>Niokolo NP, Badiar NP, Bafing NP, Boucle du Baoulé NP, complex Faleme and Chimpanzee areas Bafing and Fouta Djallon</i> 4. Gourma Elephant, Sahel Faunal Reserve and Inner Niger Delta Savannas Landscape of Conservation (26,500 km² of PAs) <i>Gourma Elephant FR, Sahel FR and 5 IBAs in the Inner Niger Delta</i> <p>Key Conservation Areas</p> <ol style="list-style-type: none"> 5. Lion Key Conservation Areas (8,200 km² of PAs) <i>Kainji Lake NP and Yankari NP</i> <p>Key Landscape of Conservation</p> <ol style="list-style-type: none"> 6. Volta Trans-Border Ecosystem Wildlife Corridors (VC) (3,700 km² of PAs) <i>Ranch Nazinga and other PAs and hunting zones surrounding Nazinga</i> <p>New or larger KLC and KCA</p> <ol style="list-style-type: none"> 7. KLC and KCA to stop the decline of Wetlands (1,000 – 3,000 km² of potential wetlands) <i>see WL2 and WL3</i> 	<p>Negative aspects</p> <ul style="list-style-type: none"> - Habitats degraded and fragmented, exacerbated by high human population density and the new conflicts, civil/ religious fundamentalism unrest and refugee movements (Côte d'Ivoire/Nigeria). - Periodic droughts - Over-hunting - Strong illegal grazing in PAs (fire, hunting, poisoning predators). - PAs under-resourced and low effectiveness of management - Many "paper parks" - not active on the ground. - Threat to short-term stability and conservation of PAs. - Poverty & disadvantaged populations - Climate change <p>Positive aspects</p> <ul style="list-style-type: none"> - Biodiversity potential (elephant, western giraffes, lion, cheetah, leopard, wild dog) and high restoration potential - Cultural heritage in water conservation techniques - Potential ecotourism from private funds through international tenders. 	<p>Objectives</p> <ol style="list-style-type: none"> 1. Preserving the only functional savanna ecological complex in WA 2. Save the potential for regeneration and reintroduction of species back into the other degraded PAs. 3. Determining the most appropriate conservation actions for threatened species 4. Preservation of specific habitats especially wetland areas for birds 5. Preserve the savanna ecological blocks and the corridors between them for possible future rehabilitation. <p>Actions</p> <ul style="list-style-type: none"> - Highest priority for major support to save the WAPOK ecosystem - Ecosystem-landscape interventions together with corridors between major ecological blocks - Continuous support by the IUCN/SSC Cat Specialist Group to preserve predators through the implementation of PHVA strategies (also for game hunting). - Preserve the genetic heritage (DNA) of the West African lions by <i>in-situ</i> and <i>ex-situ</i> conservation (responsibility of WAZA). - Control and manage pastoralism to reduce the human-lion conflict (which leads to killing of lions). - Continuous support by the IUCN/SSC Antelope Specialist Group (ASG) for the Giant eland and Western giraffe and implementation of the PHVA strategic approach. - Specific protection for threatened species in PAs such as Yankari and Kainji Lake for lions - ICDP on the principles of good governance (Legitimacy & voice, Direction, Performance, Accountability, Fairness) in the buffer zones - Strong inter-sectorial policy coordination and action between agriculture, pastoralism and conservation. - Strengthen the management of human-elephant conflict caused by habitat fragmentation in order to save/ translocate small isolated groups of elephants.

Note: Red arrows denote declines in status, green arrows denote species recoveries

Figure 11. B - West Africa Savannas - Main Key Landscapes of Conservation and Key Conservation Areas and priorities

(1) WAPOK Savanna KLC (38,000 Km² of PAs); (2) Comoé – Mole Savanna KLC(16,571 Km² of PAs); (3) Niokolo - Badiar - Bafing – Baoulé - Falémé – Fouta Savannas Landscape of Conservation (ca. 25,000 Km² of PAs) ; (4) Gourma Elephant and Sahel Faunal Reserve Savanna KLC (ca. 26,500 Km² of PAs); (5) Lion Key Conservation Areas (8,200 Km² of PAs); (6) Volta Trans-Border Ecosystem Wildlife Corridors (ca. 3,700 Km² of PAs); WL Number (e.g. WL1 or WL2) indicates priority of intervention in Wetlands conservation. (map: Climate Change and Protected Areas in West Africa – CCPAWA, United Nations Environment Programme World Conservation Monitoring Centre, 2010; specific elaboration)



5.1.5 Specific strategies and actions for major Forest ecotypes

The forest ecotype of Western Africa consist of scattered mountains, high plateau areas, gently undulating landscape but also lowland and coastal forests. These forests contain some of the highest levels of faunal species richness of any African forest, especially in terms of forest-restricted mammals, birds and butterflies, but many areas are essentially unstudied. The diversity of life inhabiting these forests is astonishing (Mt. Nimba has more than 2,000 species of vascular plants recorded, more than 500 are new species and many of them are endemic; Taï Forest, the largest area of protected lowland forest in the region has 1,300 vascular plant species recorded). Discoveries of new species of plants and insects are frequent. The global demand for valuable hardwoods continues to spur logging in this region so most of the high forest areas that remain are late secondary stands and isolated from each other by slash-and-burn farming. Some of the mountain zones remain largely untouched (Loma Mountains), while others have been severely degraded and fragmented (Mount Nimba, Fouta Djallon, etc.). Only in a few areas are there sufficiently large and interconnected forests to allow migrations of animals to continue occurring. The forest blocks of Cross-Sanaga-Bioko Coastal Forests between Nigeria and Cameroon are still connected.

The forests in WA have been degraded by high human population density resulting from natural population growth, immigration from the northern countries and the refugees from civil war in the coastal countries (Liberia, Sierra Leone and Ivory Coast). High anthropogenic pressures for farmland, bushmeat hunting for local consumption, large rubber and oil-palm plantations (including “land grabs” that involve foreign companies), timber, fuelwood and mineral resources have all contributed to reduce the size and biotic potential of the WA forest habitats, especially the lowland forests. Outside the few rainforest national parks and some of the forests reserves, the rate of forest loss accelerated recently. The loss of forests has been severe in Nigeria (3.7%, in 2000-2010, the highest in the world, FAO, 2010), Guinea and Côte d'Ivoire. Subsistence agriculture in the wake of commercial logging together with hevea and palm oil plantations have reduced the area of primary forest to just fragments. Siltation from mining for diamonds and gold is threatening freshwater fish populations, while hunters have increased poaching to supply bushmeat to the mining settlements. Organized crime networks involved in cannabis cultivation (which means forest clearance) and cross-border wildlife trade also contribute to the disappearance of forests. Habitat loss for farming and plantations, coupled with an intensive bushmeat trade, are pushing some mammal species, particularly rain-forest primates, towards extinction.

The largest stands of forest in WA are found within protected areas and forest reserves. The management of protected areas and reserves is currently poor or non-existent, especially in Guinea, Sierra Leone and Liberia. The total area of protected forest in WA is just under 3 percent for all national parks and other reserves. However there are still important forests blocks that could complement the overall biodiversity of this ecotype, but these have not been elevated to the status of conservation areas. A recent study on the pattern of mammal extinctions in the PAs of west and central Africa shows that there is no significant correlation between the size of PA, the high demographic pressure and the size and the number of functional mammal extinctions¹⁷. However, the extinction of mammals increases following a south-north gradient: it is lower for the PAs of rain forests and higher for the PAs of the sahelio-saharan savanna and steppes. So despite the small size of the forest PAs, and the high anthropogenic pressures, biodiversity values in WA rain forests could be maintained if habitats are preserved and poaching curbed.

¹⁷ David BRUGIERE, Bertrand CHARDONNET, Paul SCHOLTE, 2014: Pattern and correlates of mammal extinction as a measurement of conservation effectiveness of protected areas in west and central Africa, [Preliminary results V1.2](#)

The threats to biodiversity are habitat degradation by farming and wood cutting, and high levels of poaching. Endemic plants, insect, birds, amphibians and small and large mammals are all at risk of extinction. Furthermore the low representativity of PAs across the whole forest area means that there is a danger of losing hitherto unknown biodiversity. For example there are no protected areas in the Niger delta swamp forests. Deforestation and degrading agricultural systems also makes the area more vulnerable to climate change (which will lead to further pressure on PAs).

Selecting key sites in the West African forest zone on which to concentrate resources should be an important part of any conservation strategic approach. Choosing appropriate sites in West Africa is not difficult, because so few protected areas of reasonable size exist in the forest zone. **Among the most important sites are Gola Forest and (newly-created) Loma Mountains in Sierra Leone, Sapo in Liberia, Tai in Côte d'Ivoire, and Cross River in Nigeria, along with the Ankasa and Bia Conservation Areas in Ghana.** These protected areas contain some of the most important populations of forest elephants, pygmy hippopotamuses, and great apes in the region.

The intervention strategic approach requires:

- (i) concentrating actions in principal KLCs and KCAs (see below). They are all equally important in terms of species richness and diversity;
- (ii) reducing threats on PAs by adopting a holistic approach to ensure inter-sectorial policy development, analysis of environmental impacts, the valuing of ecosystem services and the respect of conservation principles;
- (iii) determining the most appropriate conservation actions for threatened species, by the establishment of PHVA analysis if necessary, the preservation of specific habitats inside or outside the PAs and the combination of *in-situ* and *ex-situ* conservation if necessary.

For summarised global data: see Table 22 and Figure 12.

It is recommended that the highest priority be given to trans-border KLCs and key conservation areas.

Cross River – Korup – Mont Cameroon - Tamakanda – Gashaka – Tchabel – Faro (CKMCTGTF) Forests KLC (19,110 km² of PAs)

This complex encompasses: (1) the 3,643 km² Cross River NP in Nigeria, (2) the 1,295 km² Korup National Park in Cameroun, (3) the 620 km² Tamakanda NP in Cameroon, (4) the 581 km² Mont Cameroon, (5) 6,670 km² Gashaka-Gumti NP, (6) the 3,000 km² Tchabel Mbabo Wildlife Reserve and (7) the 3,300 km² Faro NP. The landscape is located along the Cameroon-Nigeria border (Figure 20).

The forest blocks of Cross-Korup are still connected. The Cross River NP is divided into two sections separated by about 50 km of disturbed forest. The (1.a) Oban Division (IBA - NG007) the largest sector of the park is contiguous with Korup National Park in Cameroon (IBA - CM019). The (1.b) Okwangwo Division (IBA - NG010) the smaller part of the park is connected with the (3) Tamakanda NP. The complex is a large area of lowland and submontane rainforest. In the less accessible areas the forest has had little interference, but elsewhere the exploitation has resulted in secondary regrowth and the establishment of plantations of oil-palm and rubber. The terrain is rough and elevation rises from the river valleys to over 1,000 m in mountainous areas but the terrain is generally flat, with hills and escarpments.

The Mont Cameroon NP (4) is one of Africa's largest volcanoes, rising to 4,040 metres. It has a wide range of habitats including lowland, evergreen rainforest, mangrove, coastal vegetation, swamp forest, submontane forest, montane forest and grassland. Mont Cameroon is home to 49 strictly endemic and 50 near endemic plant species, 20 of the 28 restricted-range bird species of the EBA, including the 2 strictly endemic species, 3 endemic species of butterfly and large mammals including the Forest Elephant. The (5) Gashaka-Gumti NP (IBA - NG001), the largest of Nigeria's National Parks, is contiguous with (6) Tchabel Mbabo in Cameroon (IBA - CM009), both far from the isolated Faro NP (IBA - CM009). The area is situated on the mountains rising up to 2,400 m but there are also extensive lowland areas. The area is a heterogeneous mix of habitats comprising montane forests and grasslands, derived savanna with relict lowland forests, riparian forest and Sudan–Guinea Savanna woodlands. The Faro NP (7) is a large block of Sudanian savanna on gently undulating terrain at 250–500 m (Table 16).

Box 5. Importance of Cameroon-Nigeria border and trans-border conservation measures

THE CAMEROON-NIGERIA BORDER

The Cameroon-Nigeria border region, where the Cross River Gorilla occurs, is a biodiversity hotspot of global significance that supports a high diversity of animal and plant species that can occur in large numbers in restricted ranges. Many of them are threatened. These forests contain some of the highest rates of animal species richness of any African forest, especially in terms of forest-restricted mammals, birds and butterflies. Many of these animals are endemic. The ecotype is heavily impacted by human use, including logging and plantation agriculture. Threatened primates share parts of the same habitat including the Cross River Gorilla, the Nigeria-Cameroon chimpanzee, the Roloway monkey and the Drill (*Mandrillus leucophaeus*).

Given the small and highly fragmented populations of the Cross River Gorillas, it is important to protect the corridors connecting the sub-populations and to increase the effectiveness of existing and proposed protected areas within their range. Taken together, these findings serve to emphasize the need to expand our knowledge of the gorilla's range.

Trans-border conservation measures have already been developed or proposed for a number of other protected areas that lie on either side of the Nigeria-Cameroon border. These are: the Oban Division of Cross River NP in Nigeria and the connected Korup NP and Tamakanda NP and the block Gashaka Gumti NP in Nigeria and Faro NP and a proposed protected area at Tchabal Mbabo in Cameroon.

Table 16. Key elements of the Cross River - Korup - Mont Cameroon - Tamakanda - Gashaka - Tchabel - Faro (CKTGTF) Forests KLC

Elements	Priority elements
KLC	Forests with some of the highest rates of animal species richness of any African forest, especially in terms of forest-restricted mammals, birds and butterflies.
Conservation Objectives	<ol style="list-style-type: none"> 1. Preserving one of the forest biodiversity hotspots of global significance 2. Protection of forest fauna and habitats with priority given to a landscape approach with corridor protection. 3. Establish ecosystem – landscape governance and save corridors between the major ecological blocks. 4. Adopt the most appropriate conservation actions for threatened species (primates).
Key Species	<ul style="list-style-type: none"> – Threatened primates: Cross River Gorilla, the Nigeria-Cameroon chimpanzee, the Roloway monkey, the Drill – Elephant, Pygmy Hippo Jentink's Duiker, Water chevrotain, Leopard – Forest dependent birds; more than 25 are threatened or restricted-range species
Key habitats	<ul style="list-style-type: none"> – Lowland, submontane and montane rainforest – Savannas with relict lowland forests, riparian forest and Sudan–Guinea savanna woodlands – Sudanian savanna (Faro NP)

Taï – Grebo - Sapo (TGS) Forest KLC (7,700 km² of PAs)

The complex encompasses (1) the 3,300 km² of the Taï NP (IBA - CI011) and its buffer area (960 km²) and Nzo Faunal Reserve (930 km²) in Côte d'Ivoire, (2) the 971 km² Grebo National Forest (IBA - LR009) and (3) the 1,550 km² Sapo NP (IBA - LR008) in Liberia.

Taï NP is the largest and best-preserved remnant of Upper Guinea rainforest in West Africa. This humid tropical forest has a high level of endemism. The park contains some 1,300 species of higher plants. Much of the forest in the park is unlogged, mature, old-growth with emergents rising to 60 m. The fauna is fairly typical of West African forests and the park contains 47 of the 54 species of large mammal known to occur in Guinean rainforest including five threatened species. Mammals include

the mona monkey, white-nosed monkey and diana monkey, black and white colobus, red colobus and green colobus, sooty mangabey, chimpanzee, giant pangolin, tree pangolin and long-tailed pangolin, golden cat, leopard, elephant, bushpig, giant forest hog, pygmy hippopotamus, water chevrotain, bongo, buffalo and an exceptional variety of forest duikers. Over 230 bird species have been recorded, 143 typical of primary forest.

The (2) Grebo National Forest is an area of evergreen lowland rainforest enclosed on three sides by a large, easterly projecting meander of the Cavalla River, on the international frontier with Côte d'Ivoire, in the extreme east of the country.

The (3) Sapo NP contains the second-largest area of primary tropical rainforest in WA after Taï National Park in neighbouring Côte d'Ivoire. The park is a biodiversity hotspot that has "the highest mammal species diversity of any region in the world and one of the richest amounts of floral species in the country, with many endemic species. The Sapo NP is hosting around 125 mammal species and 590 types of bird, including a number of threatened species. The park is home to the pygmy hippopotamus. Note that IUCN Species Survival Commission reports: "Sapo NP is the only realistic choice of a suitable conservation area for the Pygmy Hippopotamus". Other important species are forest elephant, seven species of monkey (including Chimpanzee and the endangered Diana monkey), crocodiles, leopards, three species of pangolin, seven species of duiker antelopes (including the vulnerable Jentink's duiker and zebra duiker). Sapo National Park remains relatively inaccessible and this significant and environmentally rich area remains somewhat undeveloped for management, research and tourism (Table 17).

Table 17. Key elements of the Taï – Grebo - Sapo (TGS) Forest KLC

Elements	Priority elements
KLC	The largest and best-preserved remnant of Upper Guinea rainforest between Côte d'Ivoire and Liberia
Conservation Objectives	<ol style="list-style-type: none"> 1. Preserves the last remnant of Upper Guinea rainforest with priority for landscape conservation with protected corridors. 2. Establish ecosystem–landscape governance system. 3. Adopt the most appropriate conservation actions for threatened species (mammals and birds).
Key Species	<ul style="list-style-type: none"> – Endemic species: pygmy hippo, chimpanzee, Jentink's and zebra duikers, – 12 endemic birds and bird species of primary forest
Key habitats	– Tropical and subtropical moist broadleaf forests

Mount Nimba (MN) Forest KLC (415 km² of PAs)

The complex covers the 175 km² of the Nimba Mountains Strict Nature Reserve (1944), (1) in Guinea (85 km²) and (2) in Côte d'Ivoire (65 km²) and (3) in 240 km² of the East and West Nimba Nature Reserve in Liberia. This area was designated as a Biosphere Reserve in 1980 and a World Heritage Site in 1981.

Rising above the surrounding savannas and covered in dense forests, Mount Nimba (and its surrounding mountains) is an area with some of the highest biodiversity in the West African region due to its unique geographical and climatic location. The complex is home to a large number of plant species, more than 317 vertebrate species (107 of which are mammals including a significant population of West African chimpanzees) and more than 2,500 invertebrate species, many of which are only found in this region. More than 2,000 species of vascular plants, including several endemic or quasi-endemic plants, have been recorded. This site has been identified as an Alliance for Zero Extinction (AZE) species/site profile due to its containing a Critically Endangered or Endangered species with a limited range.

Mount Nimba has received legal protection from both Guinea and the Ivory Coast, but the habitat is still threatened by activities occurring adjacent to the site boundaries and spreading into the protected area. While a large portion of the forests are still present inside the Biosphere's reserve core, much of the fauna have suffered because of human practices such as poaching, agriculture, bush fires, and mining.

The project "Steward" of the USAID's regional program for conserving the biodiversity of the Upper Guinean Forest of West Africa is the promoter of the Nimba transborder initiative and it is still working in the area. STEWARD was conceptualized in 2005-2006 and is currently (2011-2015) in its implementation phase (see table 18).

Table 18. Key elements of the Mount Nimba (MN) Forest KLC

Elements	Priority elements
KLC	<ul style="list-style-type: none"> – Conservation of unique forest and mountains landscape and important birdlife areas between Guinea, Côte d'Ivoire and Liberia – Protection of the World Heritage Site
Conservation Objectives	<ol style="list-style-type: none"> 1. Preserving the unique ecological blocks of the Mount Nimba World Heritage Site 2. Establish ecosystem governance 3. Adopt the most appropriate conservation actions for threatened species
Key Species	<ul style="list-style-type: none"> – Unique and endemic species – West African chimpanzees – Endemic or quasi-endemic plants – Forest dependent birds; three species of global conservation concern
Key habitats	<ul style="list-style-type: none"> – Dense montane forests

Gola-Lofa-Foya (Sierra Leone-Liberia Trans-border Peace Park) and Mano-Wologizi-Wonegizi-Ziama (GLF-MWWZ) Forests KLC (2,550 + 914 km² of PAs)

This large complex hosting only partially contiguous conservation areas is located between Sierra Leone, Liberia and Guinea. The complex encompasses a first block with (1) the 750 km² Gola Forest Reserve in Sierra Leone, (2) the 800 km² Lofa and (3) 1,000 km² Foya Forest Reserves in Liberia and a second block with (4) the c. 550 km² Mano, (5) the 995 km² Wologizi, (6) the 380 km² Wonegizi and (7) the 914 km² Ziama (Figure 24).

The complex encompasses the Gola-Lofa-Foya Trans-border Peace Park between Sierra Leone and Liberia and the forest and mountains complex of Mano-Wologizi-Wonegizi-Ziama between Liberia and Guinea. The Trans-border Peace Park unites the Gola Forest Reserve in Sierra Leone and the Lofa and Foya Forest Reserves in Liberia.

The proposed Sierra Leone-Liberia Trans-border Peace Park (Figure 23) covers a large area of rainforest, evergreen in the south, becoming progressively more semi-deciduous to the north. The rivers in the parks are characterized by spectacular rapids and waterfalls and are usually unfordable. The human population within the parks is very low and the vegetation remains largely unmodified. Both the areas in Sierra Leone and Liberia are IBAs.

The (5) Wologizi Mountains are an isolated area of upland located in north-west of the Liberia. The area includes Liberia's highest mountain (Mount Wuteve at 1,447 m) and other peaks. Lower parts are covered with relatively open forest. The foothills and lower valleys are surrounded by large areas of savanna woodland.

The (6) Wonegizi Mountains (IBA LR002) is contiguous with the Massif du Ziama Biosphere Reserve (IBA GN016) in Guinea. The vegetation consists mainly of semi-deciduous forest, similar in composition to that found on the Wologizi Mountains (IBA LR001). The site spans a still largely intact transition from lowland rainforest to semi-montane Parinari-dominated forest at altitude.

The (7) Massif du Ziama Biosphere Reserve forms part of the Guinea Highlands. Part of the western boundary is contiguous with the Wonegizi Mountains in Liberia. Much of the terrain is extremely rugged. The whole area was forested originally, but primary forest now remains only in the remote upland parts of the south-west, next to the Liberian border. There are also areas of swamp and of wooded savanna on lateritic outcrops of the high plateaux. The core zone of the reserve covers 600 km² (Table 19).

Table 19. Key elements of the Gola-Lofa-Foya (Sierra Leone-Liberia Trans-border Peace Park) and Mano-Wologizi-Wonegizi-Ziama (GLF-MWWZ) Forests KLC

Elements	Priority elements
KLC	The forests and mountains landscapes and important birdlife areas between Sierra Leone, Liberia and Guinea
Conservation Objectives	<ol style="list-style-type: none"> 1. Preserving the most important ecological blocks of PAs in the forests of WA 2. Protection of forest fauna and habitats 3. Establish ecosystem – landscape governance and save corridors between the major ecological blocks

Elements	Priority elements
	4. Adopt the most appropriate conservation actions for threatened species
Key Species	<ul style="list-style-type: none"> – Forest Elephant, Pygmy Hippo Jentink's Duiker, Water chevrotain, Leopard and thirteen species of primate, one of the highest densities of chimpanzees in WA and CA (Loma Mountains) – More than 300 forest dependent birds; more than 25 are threatened or restricted-range species
Key habitats	<ul style="list-style-type: none"> – Rainforest, evergreen and semi-deciduous – Lowland forest - mixed moist evergreen and semi- evergreen – Mountain forests with spectacular rapids and waterfalls – High plateaux – River valleys

Outamba/Kilimi - Kuru – Pinselli – Soya (OKKPS) Forest KLC (1,110 km² of PAs)

This complex is in the transborder area between Sierra Leone and Guinea. The complex encompasses (1) the 1,110 km² Outamba-Kilimi NP and Forest Reserves in Sierra Leone (Kuru Hill) and in Guinea (Pinselli and Soya). The park is split into two areas, Outamba and Kilimi, between which lies an unprotected strip of land. The Guinea's protected forests are in the Madina Oula, Soya & Oure Kaba sub-prefectures. The complex has varying landscapes of savanna and forest. With a diverse landscape, the areas are home to large numbers of fauna and flora. Some 256 bird species have been recorded from the park including three species of global conservation concern. For mammals, the site is an important refuge for at least nine species of primate and also several large mammals such as the leopard, pygmy hippopotamus and forest elephant.

The project "Steward" of the USAID's regional program for conserving the biodiversity of the Upper Guinean Forest of West Africa is the promoter of the transborder initiative and it is still working in the area. STEWARD was conceptualized in 2005-2006 and it is currently (2011-2015) in its implementation phase (Table 20).

Table 20. Key elements of the Outamba/Kilimi - Kuru – Pinselli – Soya (OKKPS) Forest KLC

Elements	Priority elements
KLC	The forests and mountains landscapes and important birdlife areas between Sierra Leone and Guinea
Conservation Objectives	<ol style="list-style-type: none"> 1. Protection of mountains landscapes and important birdlife areas 2. Establish ecosystem – landscape governance and save corridors between the major ecological blocks 3. Adopt the most appropriate conservation actions for threatened species (primates) 4. Preservation of specific habitats for birds
Key Species	<ul style="list-style-type: none"> – West African chimpanzee, forest elephant, pygmy hippo Jentink's duiker, water chevrotain, leopard – Forest dependent birds (three species of global conservation concern)
Key habitats	<ul style="list-style-type: none"> – Landscape of savanna and forests

National level: WA Forest Key Conservation Areas requiring high priority direct support (680 km² of PAs)**(1) Ankasa NP in Ghana**

The park is a virgin evergreen rain forest having exceptional botanical species and extending to 490 km² in area. The forest has the most biological diversity of any other PA in Ghana, with over 300 different plant species having been recorded in a single hectare of forest. Animal life includes the elephant, bongo, 10 types of primates including chimpanzee (although these have not been seen for some time) and Diana monkey, leopard, more than 260 species of birds (IBA - GH001) and hundreds of varieties of butterflies. The park incorporates the former Nini-Suhien National Park. It has benefited from recent EU conservation funding.

(2) Bia NP in Ghana

The 190 km² park and the 563 km² of the connected Resource Reserve are characterized by a transitional forest between moist evergreen and moist semi-deciduous. The core area is untouched rain forest with the distinction of having some of the tallest trees in West Africa, but the site is isolated being surrounded by mixed farms and secondary forest. Bia NP has forest elephants, chimpanzee, Colobus monkeys, Diana monkey, leopard, buffalo, the giant hog, and a variety of antelopes. The park is the only known natural home of the newly discovered lizard, Agama Sylvanus, and the variety of the animal life is outstanding. Bird species number about 200 including few endangered birds (BIA - GH003) (Figure 12 and Table 21). This park also has benefited from recent EU conservation funding.

Table 21. Key elements of Forest KCAs

Elements	Priority elements
KCAs	– Untouched rain forests having exceptional biodiversity
Conservation objectives	<ol style="list-style-type: none"> 1. Protection of untouched rain forests and habitats 2. Establish ecosystem – landscape governance 3. Adopt the most appropriate conservation actions for threatened species 4. Further develop eco-tourism potential 5. Further develop community conservation and livelihood initiatives
Key Species	<ul style="list-style-type: none"> – Elephants, chimpanzee, Colobus monkeys, Diana monkey, leopard, – Endemic and endangered birds – Endemic lizard, Agama Sylvanus
Key habitats	<ul style="list-style-type: none"> – Evergreen rain forest – Transitional forest between moist evergreen and moist semi-deciduous

New or larger national protected areas should be created (Liberia, Ghana and Nigeria)

Evaluate about 3,000 – 5,000 km² of forests for new or larger PAs (addition of +7-11% of new or larger national PAs than existing KLCs and KCAs as considered by the strategic approach for the specific Forests ecotype) (Figure 12).

Table 22. C - West Africa Forests - Main KLCs and KCAs and priorities

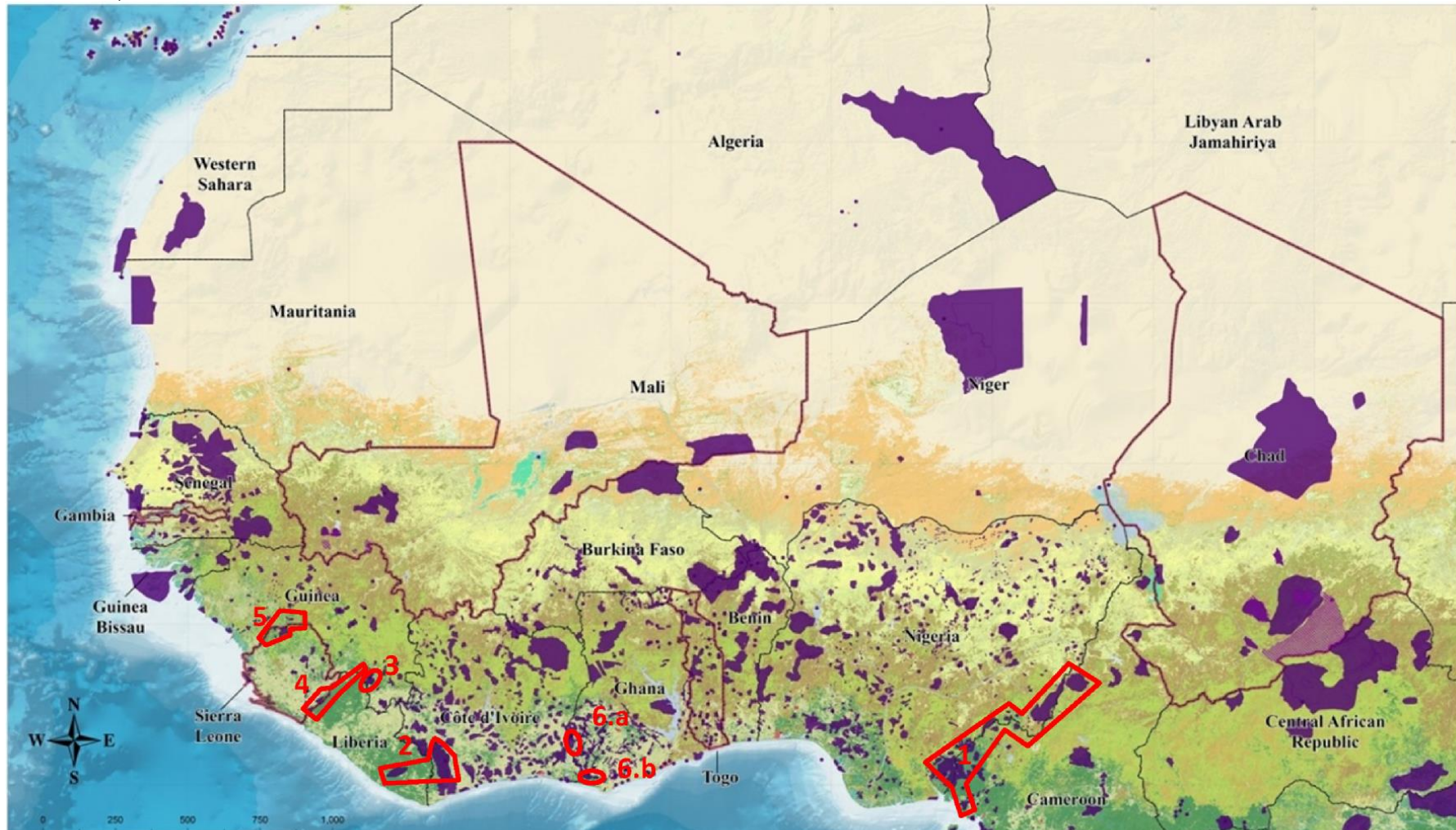
Protecting biodiversity	Countries	Biome / Ecotypes / Key species	Main KLCs - KPAs and priorities	Analysis	Proposed actions																						
<ul style="list-style-type: none">- Highest rates of plant and animal species richness of any African forest- Large mammals, especially primates, in the forest zone are threatened by both hunting and habitat destruction- Relatively poor knowledge of the biology and threats to WA forest wildlife (e.g. to understand the possible distinctiveness of the rare and threatened WA elephant as a third species)- Highly fragmented populations of elephants with only small groups in the forest ecotypes- Outside PAs and Forest Reserves, the loss of forest is severe- Special habitats are extremely degraded- Very high numbers of endemics in plants, mammals, birds, amphibians, insects but also high extinction risk of endemic species of plants, insect, birds, amphibians and small and large mammals.- Deforestation for cannabis cultivation with poaching and trans-border illegal wildlife trade- Important forest blocks that could be elevated to the status of conservation areas- Low correlation between the size of PA, the high demographic pressure and the functional extinction of mammals (see footnote 15)- Protection of threatened trees: Afromosia or African Teak Meliaceaea family (Khaya species), the Vène	<ul style="list-style-type: none">- Benin- Côte d'Ivoire- Gambia- Ghana- Guinea- Guinea Bissau- Liberia- Mauritania- Nigeria- Senegal- Sierra Leone- Togo	<p>Biome:</p> <ul style="list-style-type: none">- Tropical and subtropical moist broadleaf Forests <p>Ecotype:</p> <ul style="list-style-type: none">- Guinean Montane Forests- Western Guinean lowland forests- Eastern Guinean forests- Nigerian lowland forests- Cameroonian Highlands forests- Cross-Sanaga-Bioko coastal forests- Niger Delta swamp forests- Cross-Niger transition forests. <p>Key species and status:</p> <table><tr><td>Niger Delta red colobus</td><td>▼▼▼</td></tr><tr><td>Preuss's red colobus</td><td>▼▼▼</td></tr><tr><td>Cross River gorilla</td><td>▼▼▼</td></tr><tr><td>Roloway monkey</td><td>▼▼▼</td></tr><tr><td>Drill</td><td>▼▼▼</td></tr><tr><td>Nigeria-Cameroon chimpanzee</td><td>▼▼▼</td></tr><tr><td>Pygmy hippopotamus</td><td>▼▼▼</td></tr><tr><td>Jentink's duiker</td><td>▼▼▼</td></tr><tr><td>Forests Elephant</td><td>▼▼▼</td></tr><tr><td>Procolobus badius</td><td>▼▼▼</td></tr><tr><td>Leopard</td><td>▼</td></tr></table>	Niger Delta red colobus	▼▼▼	Preuss's red colobus	▼▼▼	Cross River gorilla	▼▼▼	Roloway monkey	▼▼▼	Drill	▼▼▼	Nigeria-Cameroon chimpanzee	▼▼▼	Pygmy hippopotamus	▼▼▼	Jentink's duiker	▼▼▼	Forests Elephant	▼▼▼	Procolobus badius	▼▼▼	Leopard	▼	<p>Key Landscape of Conservation</p> <p>1. <u>Cross River – Korup – Tamakanda – Gashaka – Tchabel – Faro (CKTGTF) Forests Landscape of Conservation</u> (19,100 km² of PAs)</p> <p>2. <u>Tai – Grebo - Sopo (TGS) Forest Landscape of Conservation</u> (7,700 km² of PAs)</p> <p>3. <u>Mount Nimba (MN) Forest Landscape of Conservation</u> (415 km² of PAs)</p> <p>4. <u>Gola-Lofa-Foya and Mano-Wologizi-Wonegizi-Ziama (GLF-MWWZ) Forests Landscape of Conservation</u> (3,500 + 1,900 km² of PAs)</p> <p>5. <u>Outamba/Kilimi - Kuru – Pinselli – Soya (OKKPS) Forest Landscape of Conservation</u> (1,110 km² of PAs)</p> <p>Key Conservation Areas</p> <p>6. <u>National level: WA Forest Key Conservation Areas requiring high priority direct support</u> (680 km² of PAs)</p> <p>7. <u>New or larger KLCs and KCAs should be created</u> (Liberia, Ghana, Nigeria)</p>	<p>Negative aspects</p> <ul style="list-style-type: none">- Highly degraded and fragmented habitats- Over-hunting- PAs as a refuge for illegal activities (organized crime for drugs cultivation, illegal trade, etc.)- PAs: low number, small size and under-representation of forests ecotypes- Valuable hardwoods continues to spur logging in the high canopy forests- Migrations of animals severely reduced- Acceleration of forest loss (civil wars)- Effects of mining on sustainable natural resource management- PAs under-resourced and poorly managed- Some countries with non-existent PA management, others with very poor management (paper parks)- High density of poor and disadvantaged populations- Danger from loss of unknown biodiversity- CC and degradation of agricultural systems and more threats on PAs- Relatively superficial knowledge about the	<p>Objectives</p> <ol style="list-style-type: none">1. Preserving the forest biodiversity hotspots of global significance2. Establish ecosystem – landscape governance and save corridors between the major ecological blocks3. Adopt the most appropriate conservation actions for threatened species <p>Actions</p> <ul style="list-style-type: none">- Provide greater control of hunting by anti-poaching activities and law enforcement- Adopting a holistic approach that ensures mainstreaming of PAs in the development context and respects the principles of conservation at local, national and international level- Promote strong inter-sectorial policy development and action between agriculture, mining, infrastructures, etc. and conservation- Strengthen the oversight of the environmental impact of mining, agro-industry, hydroelectric and other infrastructure projects- Raise awareness by populations of sustainable natural resource conservation techniques and restore and legalize their traditional resource use rules where appropriate- Focus on in-situ conservation but do not exclude the contribution of the ex-situ conservation, if necessary to preserve the genetic heritage (responsibility of WAZA)- Ensure continuous support by the IUCN/SSC Specialist Group, and
Niger Delta red colobus	▼▼▼																										
Preuss's red colobus	▼▼▼																										
Cross River gorilla	▼▼▼																										
Roloway monkey	▼▼▼																										
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Nigeria-Cameroon chimpanzee	▼▼▼																										
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Forests Elephant	▼▼▼																										
Procolobus badius	▼▼▼																										
Leopard	▼																										

Protecting biodiversity	Countries	Biome / Ecotypes / Key species	Main KLCs - KPAs and priorities	Analysis	Proposed actions
<p>(Pterocarpus erinaceus), and African Blackwood (Dalbergia melanoxylon); etc.</p> <ul style="list-style-type: none"> - The first-ever forest elephant translocation in West Africa of 6 elephants from small patches of forest outside the town of Daloa to Azagny National Park, although with some mortalities. 				<p>biology and threats to WA rain forest wildlife (e.g.. elephant)</p> <p>Positive aspects</p> <ul style="list-style-type: none"> - Existing forests blocks to complement the overall biodiversity could still be integrated into PA system - Astonishing diversity of life inhabiting the rain forests of WA - Rain forest PAs of small size can ensure the conservation of biodiversity (see footnote 15) - First trans-border parks (peace parks and systemic management) - Cultural heritage in sustainable management of natural resources - Potential discoveries of new species 	<p>implementation of the PHVA strategic approach for threatened species</p> <ul style="list-style-type: none"> - Establish a regional strategic approach that focuses on conservation principles, integrate conservation in development processes (i.e. the valuation of sustainable ecosystem services) and promotes ICDP and good governance in the buffer zones - Support and sustain the political will to tackle conservation problems, to fulfil the gaps in scientific knowledge and to establish objectives, indicators and benchmarks for conservation - Support civil society on issues of wildlife management and protection and support the growth of a network of local non-governmental organizations in West Africa - Operate at the national level and not just locally in raising awareness for nature conservation.

Note: Red arrows denote declines in status, green arrows denote species recoveries

Figure 12. C - West Africa Forests - Main KLCs and KCAs and priorities

(1) Cross River – Korup – Mont Cameroon – Tamakanda – Gashaka – Tchabel – Faro Forests Landscape of Conservation (19,100 Km² of PAs); (2) Tai – Grebo - Sopo Forest Landscape of Conservation (7,700 Km² of PAs); (3) Mount Nimba Forest Landscape of Conservation (415 Km² of PAs); (4) Gola-Lofa-Foya (Sierra Leone-Liberia Trans-border Peace Park) and Mano-Wologizi-(Wonegizi-Ziama (GLF-MWWZ) Forests Landscape of Conservation (2,550 + 914 Km² of PAs); (5) Outamba/Kilimi - Kuru – Pinselli – Soya Forest Landscape of Conservation (1,110 Km² of PAs); (6) National level: WA Forest Key Conservation Areas requiring high priority direct support (map: Climate Change and Protected Areas in West Africa – CCPAWA, United Nations Environment Programme World Conservation Monitoring Centre, 2010; specific elaboration)



5.1.6 Specific strategies and actions for major Mangroves/Coastal ecotypes

In WA, mangroves are found discontinuously from Senegal to the Niger delta. Some 14% of identified mangrove areas in West Africa fall within nationally and internationally designated protected areas. However, there are strong concerns about the management coordination and effectiveness of the coastal and marine protected areas that encompass the mangroves, predominantly due to financial and administrative constraints in the region.

West African mangroves are in moderate decline, with an estimated average decline of 25% between 1980 and 2006. The Atlantic coast of Africa has some of the highest human population densities on the continent. The majority of industry of West Africa is located in the coastal zone (Nigeria and Côte d'Ivoire). In west and central Africa some 20-30% of mangroves have been lost in the past 25 years (Côte d'Ivoire shows a particularly severe decline in mangrove habitat). This, together with rapid growth, high poverty, low development indices, poor governance in rural regions and open access of coastal resources has depleted the mangroves forests. Threats include urbanisation, industrialisation (such as the oil refineries of the Niger Delta), agriculture, timber and petroleum exploitation, fishing with dynamite and poison, canalisation, discharge of sewage and other pollutants and siltation.

The WA mangroves are allocated into different ecotypes. The Guinean Mangroves, influenced by a large tidal range and high inputs of freshwater, contain the best developed mangroves in western Africa. This ecotype provides important habitat for migratory birds and endangered species such as the West African manatee. However, the mangrove habitat has been affected by poor rainfall over the entire region during the past three decades. The most extensive blocks of Central African mangroves are found in the Niger River Delta, which supports the single most extensive mangrove system in Africa, and the third most extensive worldwide after India and Indonesia. Despite its size, it is extremely threatened because none of it falls within a PA. These mangroves occur in suitable low energy marine environments and they trap large amounts of sediment. The mangroves of this region have no endemic species but support some endangered species, such as manatees and, it seems also the pygmy hippopotamus, in the Niger Delta. Mangroves here, as elsewhere, are important as nursery and feeding areas for marine fishes.

The mangroves depend for their conservation on coastal and marine protected areas and both are highly dependent on their environment and in particular on the context and dynamics of development, including development taking place far from the mangrove sites. The extension of coastal and marine protected areas to new sites and the prioritizing of mangrove areas for conservation intervention requires accurate forecasting about human developments as the latter are moving much faster than conservation efforts. Careful examination of different development scenarios is essential in order to guarantee the viability of conservation investments in coastal and marine protected areas.

Recent data identified by the Master Plan for Coastal West Africa (Schéma Directeur du Littoral Ouest Africain – SDLAO), produced by IUCN between 2009 and 2011, confirm the importance of the dynamics of human developments that occupy the coastal strip at the expense of mangroves. This is often overlooked by conservation organisations. A further problem is that some coastal and marine protected areas do benefit from long-term funding whereas others are almost forgotten.

The need to improve the consistency and effectiveness of the ecotypes network of coastal and marine areas, led us to consider the following conservation measures as a priority:

- Implementation of conservation actions in some key areas which have not benefited from conservation (e.g. Sherbro - Sierra Leone);

Table 23. Mangrove areas falling within protected areas

Country	Mangrove area falling within protected areas [%]
Benin	0
Burkina Faso	0
Gambia	3,5
Ghana	1,5
Guinea	0,2
Guinea-Bissau	35,5
Ivory Coast	26,9
Liberia	26,1
Mali	0
Mauritania	62,5
Niger	0
Nigeria	3,4
Senegal	42,5
Sierra Leone	14,5
Togo	0

Source: Regional Action Plan for the Conservation of Chimpanzees in West Africa, Rebecca Kormos and Christophe Boesch, 2003

- Conservation of the river-sea connections (a complex of small estuaries) in the Gulf of Guinea;
- Strengthening inter-sectorial management of some border areas of high biological value and heritage;
- Address strategies and practices of the fishing and processing industry and enterprises that have significant impacts on mangroves;
- Integrate conservation with extractive activities especially those related to oil and oil storage device by strengthening marine spatial planning;
- Search for synergies between mangrove conservation activities and the need for reducing coastal risks of flooding, especially in areas where the coastline is particularly dynamic.

At present, the Abidjan Convention is implementing a strategic plan for marine protected areas on the Atlantic coast of Africa from Mauritania to South Africa. The implementation phase works in detail on three connected geographical areas: (1) from Mauritania to Sierra Leone, (2) from Liberia to Nigeria, and (3) from Cameroon to DRC.

Threats to the conservation of biodiversity of mangroves forests are as follows: clearing, overharvesting mangrove trees, mining, river changes, poaching, pollution and exotic/invasive plants. Climate change is another major threat because mangrove forests require stable sea levels for long-term survival. The interventions of this strategic approach require:

- Adopt the legislations and the international conventions relating to mangroves and develop adequate policies and inter-sectorial approaches for implementation of actions;
- Concentrate actions in the priority PAs (see below) and the community mangrove forests;
- Collaborate with national and international NGOs and empower local communities to maintain and monitor the community mangrove areas;
- Develop an integrated PA and Reserve network of coastal and marine areas encompassing mangrove and other coastal habitats;
- Establish a fund to maintain a sustainable economy and management of mangroves and coastal habitats;
- Determine the most appropriate conservation actions and studies to ensure management effectiveness of PAs and mangrove forests, and related threatened species.

Summarised, global data are provided in Table 26 and Figure 13.

Guinea Bissau

Rio Cacheu - Cufada - Cantanhez - Rio Buba - Iles Tristao (CCCBT) Mangrove KLC (4,780 km² of PAs)

The complex encompasses in Guinea Bissau (1) 886 km² the Rio Cacheu Mangroves (IBA - GW001), (2) the 723 km² Lagoas de Cufada (IBA - GW004), (3) the 1148 km² Rio Grande de Buba (IBA - GW005), (4) the 1209 km² Cantanhez Forest (IBA - GW008); and in Guinea (5) the 814 km² Iles Tristao (IBA - GN004). The complex of mangrove forests is contiguous to 10,279 km² Bijagos Archipelago Biosphere Reserve with 3 MPA: (i) Ilhas Formosa, Nago & Tchediã (Urok); (ii) Orango and (iii) João Vieira and Poilão Marine National Park.

This complex includes the ocean coasts and the lands on both banks of the rivers or lakes. Much of the area is covered in mangrove as well as fresh and brackish water marshes. The complex encompasses primary forests and sacred forests, palm forest, semi-dry woodland, savanna areas and agricultural land. The area includes mudflats and sandbanks, rivers, freshwater lagoons and lakes (Table 24).

Table 24. Key elements of the Rio Cacheu - Cufada - Cantanhez - Rio Buba - Iles Tristao (CCCBT) Mangrove KLC

Elements	Priority elements
KLC	The best developed mangroves in WA with migratory and water birds, endangered species (Manatee) and a success story of forests governance
Conservation objectives	<ol style="list-style-type: none"> 1. Preserving the best developed mangroves in WA 2. Establish an ecosystem-landscape governance system and save corridors between the major ecological blocks 3. Adopt the most appropriate conservation actions for threatened species (manatee and birds)

Elements	Priority elements
Key Species	<ul style="list-style-type: none"> – West African manatee – Migratory birds
Key habitats	<ul style="list-style-type: none"> – Mangroves as nursery and feeding areas for marine fishes, – Ocean coasts and the lands on both banks of the rivers or lakes, mudflats and sandbanks – Forests, palm forest, semi-dry woodland, savannas – Rivers, freshwater lagoons and lakes

National level: WA Mangroves KCAs requiring high priority direct support (3,062 km² of PAs) (Note: the number in brackets corresponds to the number on figure 13)

Sierra Leone

(2) Sherbro and Turtles Islands

The ca. 450 km² of the area encompasses more than two-thirds of the country's mangroves. The site should be classified as a Marine Protected Area (MPA), one of the largest in the region. The Sherbro Island and the Turtle Bank Is a mosaic of rivers and marine areas unique in the region and a breeding ground for green sea turtles as well as leatherback sea turtles (Figure 13).

Senegal

(3) Saloum Delta National Park

The 1,800 km² of this site is an IBA (SN013), but only 760 km² are designated as a National Park and Ramsar Site. The site consists of deltas of the seasonal rivers. There is a network of inter-linking channels and additional, seasonal freshwater streams that flow into the delta. The site consists of sea, sandy coast and islands and islets with mangroves, savannas and forests. The National Park and part of the buffer zone of the Biosphere Reserve are managed by the central authorities, but the remainder is managed through liaison between a rural council and National Park and forest service authorities (Figure 13).

(4) Basse Casamance National Park

The 50 km² of the National Park (IBA - SN014) is in the delta of the Casamance River. The habitat consists of low-lying lands with mangroves fringing tidal channels, seasonally bare saline mudflats, some wooded savanna and terrestrial forest, including the only remaining small area of Guinea–Congo forest in the country (Figure 13).

Ghana

(5) Keta Lagoon Ramsar site (Ghana) GH033

The 530 km² Keta Lagoon (IBA - GH033) is an extensive, brackish water-body situated to the east of the Volta river estuary. The site comprises the open water of the lagoon and the surrounding flood-plains and mangrove swamps. The lagoon is bordered by numerous settlements and the surrounding flood-plain consists of marsh, scrub, farmland and substantial mangrove stands, which are heavily exploited for fuelwood (Figure 13).

(6) Songor Lagoon

The 232 km² Songor Lagoon (IBA - GH036) is, with Keta Lagoon, one of the two major lagoon systems associated with the Volta river estuary. The site comprises a brackish water lagoon with extensive mudflats and islands, salt pans, a broad sandy beach and flood-plains of a number of small streams. It is separated from the sea by a narrow sand-dune on which small villages are situated. The lagoon has no direct access to the sea and seawater replenishment is from seepage through the sand-dunes. The main wetland vegetation-type is saline marsh with degraded mangroves (Figure 13 and Table 25).

Table 25. Key elements of the Mangroves/Coastal Key Conservation Areas

Elements	Priority elements
KCA	– The mangrove forest blocks that could be elevated to the status of conservation areas are already listed as UNESCO Biosphere Reserves, Ramsar sites, Important and Endemic Bird Areas.
Conservation Objectives	1. Preserving the best developed mangroves in WA 2. Establish ecosystem – landscape governance and save corridors between the major ecological blocks 3. Adopt the most appropriate conservation actions for threatened species (manatee and birds)
Key Species	– West African manatee – Migratory birds
Key habitats	– Mangroves as nursery and feeding areas for marine fishes, – Ocean coasts and the lands on both banks of the rivers or lakes, mudflats and sandbanks – Forests, palm forest, semi-dry woodland, savannas – Rivers, freshwater lagoons and lakes

New or larger KLCs and KCAs should be created (Nigeria, Ivory Coast, Liberia, Sierra Leone, Senegal, and Guinea)

New or larger national protected areas should be created in Nigeria, Ivory Coast, Liberia, Sierra Leone, Senegal, and Guinea. Evaluate about 1,300 – 2,000 km² of mangrove for new or larger PAs (addition of +15-25% of new or larger national PAs than existing KLCs and KCAs as considered by the strategic approach for the specific Mangroves/Coastal ecotype) (Figure 13).

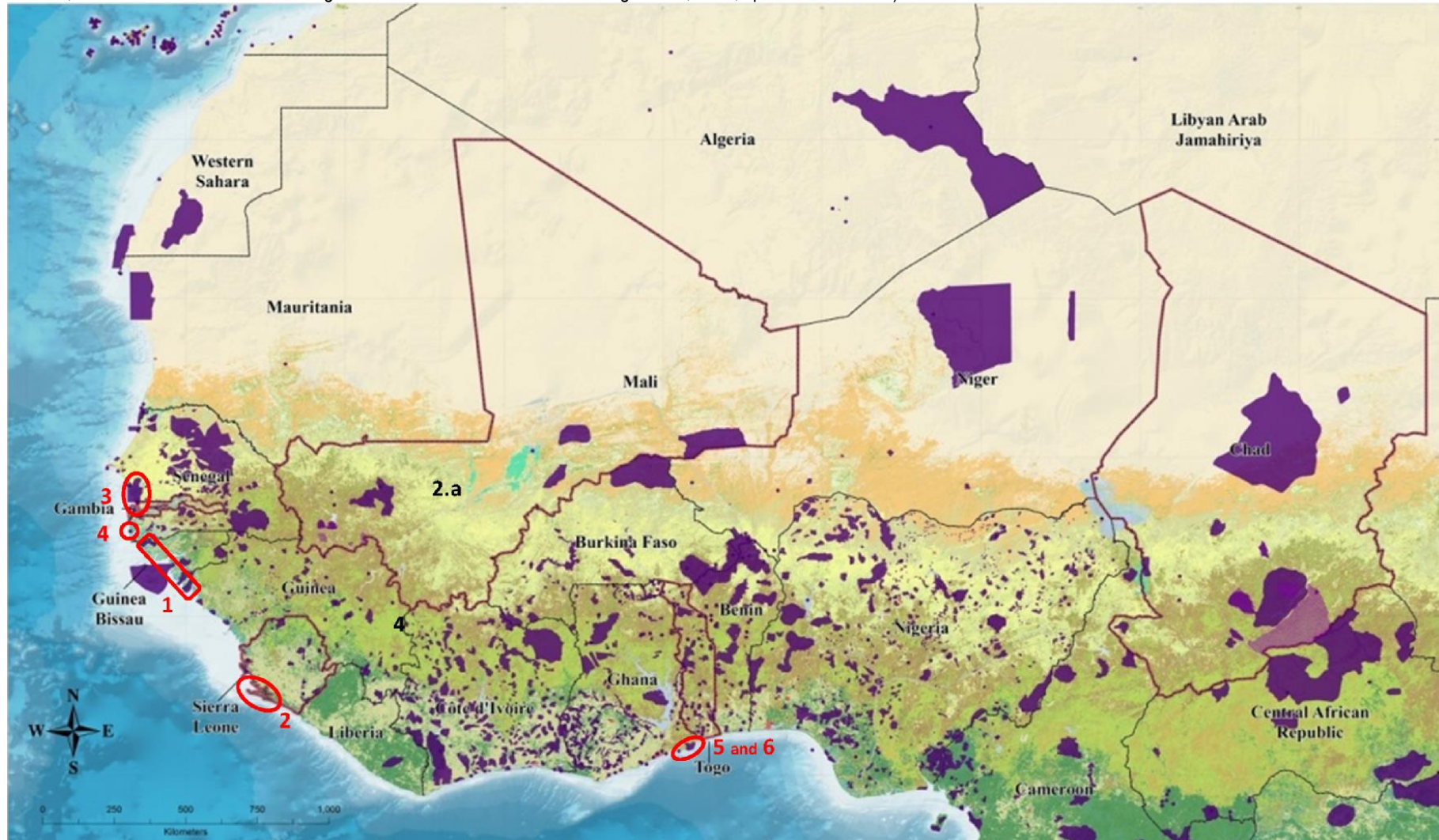
Table 26. D - West Africa Mangroves/Coastal - Main KLCs and KCAs and priorities

Protecting biodiversity	Countries	Biome / Ecotypes / Key species	KLCs - KCAs and priorities	Analysis	Objectives and Proposed actions
<ul style="list-style-type: none"> - Mangroves are very rich in biodiversity with a variety of specialist fishes (they harbour widespread pelagic fishes), marine turtles, invertebrates, various unique species such as the West African manatee, and a large number of Palearctic and Afro-tropical bird species - Low number and under-representation of this habitat/ecotype in Protected Areas or no-representation in some instances (e.g. in Nigeria) - Many mangrove forest blocks are designated as UNESCO Biosphere Reserves, Ramsar sites, Important and Endemic Bird Areas. - Fragmentation does not greatly affect mangrove biodiversity, as mangroves are naturally fragmented, and are able to disperse over long distances - Important mangrove forest blocks that could be elevated to the status of conservation areas 	<ul style="list-style-type: none"> - Gambia - Ghana - Guinea - Guinea-Bissau - Ivory Coast - Liberia - Mauritania - Nigeria - Senegal - Sierra Leone 	<p>Biome:</p> <ul style="list-style-type: none"> - Mangroves <p>Ecotype:</p> <ul style="list-style-type: none"> - Guinean Mangroves - Central African mangroves <p>Key species and status:</p> <p>Niger Delta red colobus ▼▼▼</p> <p>West African manatee ▼▼▼</p>	<p>Key Landscapes for Conservation</p> <p>1. <u>Rio Cacheu - Cufada - Cantanhez - Rio Buba - Iles Tristao (CCCBT) Mangroves Landscape of Conservation</u> (4,780 km² of PAs)</p> <p>Key Conservation Areas (3,062 km² of PAs)</p> <p><i>Note: the number in brackets corresponds to the number on the figure 13)</i></p> <p><u>Sierra Leone</u></p> <p>2. <u>Sherbro and Turtles Islands Senegal</u></p> <p>3. <u>Saloum Delta National Park</u></p> <p>4. <u>Basse Casamance National Park Ghana</u></p> <p>5. <u>Keta Lagoon Ramsar site (Ghana) GH033</u></p> <p>6. <u>Songor Lagoon</u></p> <p>7. <u>New or larger KLCs and KCAs should be created</u> (Nigeria, Ivory Coast, Liberia, Sierra Leone, Senegal, Guinea)</p>	<p>Negative aspects</p> <ul style="list-style-type: none"> - Clearing for agricultural, human settlements and infrastructure - Overharvesting of mangrove trees for firewood, and wood, wood chip and pulp - Mining exploitation and oil spillage - River changes resulting from dams and irrigation which kill the trees - Excessive hunting of species - Pollution by fertilizers, pesticides, and other toxic man-made chemicals - Exotic/invasive plant species colonization (water hyacinth) - Climate change - Civil and political unrest (Nigeria) <p>Positive aspects</p> <ul style="list-style-type: none"> - Important ecological and economic potential for mangroves when utilised to (a) stabilise the shoreline, (b) provide protection against tsunamis, and (c) to provide critical nursery areas for fish and shrimps. - Positive example of Guinea Bissau where communities were empowered to maintain and monitor their mangrove areas; today the PA network covers 15% of the country and provides 70,000 people with food, jobs and livelihoods - Successful previous efforts to replant the mangroves trees 	<p>Objectives:</p> <ol style="list-style-type: none"> 1. Preserving the best developed mangroves in WA 2. Establish ecosystem – landscape governance and save corridors between the major ecological blocks 3. Adopt the most appropriate conservation actions for threatened species (manatee and birds) <p>Actions:</p> <ul style="list-style-type: none"> - Signature by the WA Governments of mangrove related legislations and international conventions (i.e. Convention on CC, Convention on Biodiversity, CITES, and Ramsar Convention). - Adopt an holistic approach for policy development, legislation and institutions that integrates PAs and mangrove forests in the development context and promotes conservation principles at the local, national and international levels. - Elaborate adequate policy, law and institutional provisions for mangrove forests for implementation of international conventions and National Action Plans including mangroves in protected areas. - Adopt an inter-sectorial approach in order to give greater importance to mangrove forest conservation. - Collaborate with national and international NGOs (e.g. African Mangrove Network and its national focal offices) and local communities on various projects and programmes for the conservation of mangroves and sustainable management of natural resources and poverty reduction. - Maintain a balance between the needs of the local coastal communities and the ecological services of the remaining mangrove ecosystems. - Continue searching for strategies geared towards sustainable management of mangrove forests. - Increase the role of private sector participation. - Orientate research towards providing more quantitative data for management effectiveness. - Collaborate for a strong inter-sectorial coordination on policies and actions between agriculture, infrastructures and other developments, and conservation. - Raise awareness in local communities of opportunities for sustainable natural resource conservation.

Note: Red arrows denote declines in status, green arrows denote species recoveries

Figure 13. D - West Africa Mangroves/Coastal - Main Key Landscape of Conservation - Key Conservation Areas and priorities

(1) Rio Cacheu - Cufada - Cantanhez - Rio Buba - Iles Tristao (CCCBT) Mangroves KLC (4,780 Km² of PAs) ; National levelWA Mangrove KCAs requiring high priority direct support (3,062 Km² of PAs): (2) Sherbro and Turtles Islands, (3), Saloum Delta NP (4) Basse Casamance NP (5) Keta Lagoon (6) Sogor Lagoon (map: Climate Change and Protected Areas in West Africa – CCPAWA, United Nations Environment Programme World Conservation Monitoring Centre, 2010; specific elaboration)



5.1.7 Dismantling Wildlife traffic network

West Africa is already considering the establishment of a strategic plan for dismantling the illegal wildlife traffic networks. At present priority is being given to the establishment of agreements between countries¹⁸ and the strengthening of border control actions for the WAPOK complex. The proposal for dismantling wildlife trafficking networks in WA is structured by areas of intervention. The analysis below concerns the international illegal wildlife trade (elephant poaching and ivory trade, and live animal trade). Further details of the efforts throughout Africa to tackle wildlife trafficking are presented in Volume 6 of this strategy.

Political and diplomatic

- Build awareness of the serious threats that poaching and smuggling pose to economic, regional and social security at the national and international¹⁹ levels;
- Build awareness of the current limitations in the effort to combat poaching and wildlife smuggling;
- Strengthen the outreach to WA countries on the illegal wildlife trade;
- Adopt a regional approach to fighting the illegal wildlife trade and dismantle international criminal networks;
- Strengthen national wildlife legislation, and establish the principle of international crime for illegal wildlife activities in WA countries;
- Designate / establish a high authority for this task within regional institutions (WAEMU under ECOWAS).

Intelligence and security

- Develop and implement national and international intelligence gathering systems;
- Increase investigations especially at key transit points or borders, and in local markets;
- Establish effective lines of communication with the different concerned services (wildlife, police, defence, security) intra and inter-state;
- Strengthen the capacities of anti-poaching operations in PAs (human resources, training, equipment, facilities, resources and incentives);
- Strengthen the capacities of the teams responsible for investigating and arresting poachers and wildlife traders (human resources, training, equipment, facilities, resources and incentives);
- Establish effective collaboration between NGOs and government and intergovernmental agencies to support the establishment and operation of intelligence and security networks. It would be worthwhile to **support the growth of a network of non-governmental organizations in West Africa that support government law-enforcement efforts** under the auspices of, or closely linked, with LAGA (already initiated by WAEMU) (see also Volume 4 - Central Africa). The NGOs intervention should be supported but not coordinated by the regional institutions to preserve their specific approach.

Judiciary and Conviction of illegal activities on PAs

- Establish effective cooperation and collaboration between the supervisory authorities and judicial authorities involved in the enforcement of laws against illegal wildlife networks in WA;
- Establish effective coordination and communication with law enforcement agencies (in order to ensure better conviction rates of poachers and illegal traffickers);
- Monitor and support legal proceedings against poachers and illegal wildlife traffickers in order to ensure convictions.

Security communications

- Provide regular information on the evolution of intelligence, security and legal proceedings;
- Define indicators and benchmarks for actions to dismantle wildlife trafficking networks;
- Monitor and communicate operations by the designated authority within regional institutions (WAEMU - ECOWAS);
- Provide full press coverage.

¹⁸ Signature 12 July 1984 an agreement to fight against poaching between Benin and Burkina Faso, on which joined the Niger in 1986. The agreement was implemented from January 1986

¹⁹ WA provides less information on the populations of elephants, source MIKE

The interventions should be carried-out under the coordination of a special task force headquarters in the WAEMU (proposition) and the implementation by a competent body or the association of competent bodies.

5.1.8 Special analysis

Monitoring and planning of highly threatened species and habitats

This is a priority action that must establish: (1) the status of the most endangered species and habitats and (2) a bailout plan at the regional and interregional level (i.e. a plan for an emergency package in support of threatened key species such as desert antelope and gorilla, and habitats such as the Inner Niger Delta and mangroves of the Niger Delta). The actions must be entrusted to the IUCN specialist groups or to specialized NGOs. The actions must be associated with PHVA analysis (see below) and could lead to joint actions in-situ and ex-situ conservation between national conservation agencies, NGOs and international institutions specialized and the World Association of Zoos and Aquariums (WAZA).

Population and Habitat Viability Assessment (PHVA)

The PHVA is a key planning tool to develop targets and recommendations for the conservation of endangered species and habitats, or for the analysis and support for the introduction or reintroduction of individuals into a new habitat. The PHVA is based on knowledge of stakeholder groups and uses stochastic and social measures (threats and opportunities), each of them with a degree of sustainability and uncertainty, leading to concrete proposals. The core element of the PHVA is a quantitative assessment of the risk of species and habitat extinctions, a process known as population viability analysis, or PVA. Population viability analysis evaluates the risk of wildlife population decline or extinction under current conditions, or under future conditions by using computer simulation models. The model can project the demographic behaviour of a simulated population for a specified period of time into the future, under a specific set of assumed conditions. These underlying conditions can then be altered to determine the primary drivers of population growth or decline, as well as the best options for population management to minimize the risk of extinction.

The PHVA has successfully contributed to preserving the last population of *Giraffe peralta* in West Africa. Considering the high extinction risk of species and habitats in WA, this strategic approach proposes using this key tool in a programme of direct action to better target interventions to safeguard endangered species and habitats.

New or larger KLCs and KCAs

In West Africa, the high level of degradation of wildlife, the inadequate representation of ecosystems and habitats, the fragmentation and reduced connections between the PAs, all contribute to the need for a special contingency plan to better amalgamate protected areas, forming new key landscapes for conservation to recover significant wildlife ecosystems and endangered species and habitats.

The action is critical but will not succeed unless some emergency actions are first taken. Direct interventions for saving the PAs identified in this document are urgently required, alongside a brief initial presentation phase to national and regional institutions in WA to confirm and win support for the strategic approach. The process of creating new PAs is very important, but it is a long and difficult step that requires the emergency interventions on existing sites of conservation if it is to succeed.

The intervention in support of KLCs should be carried-out under the coordination of a special unit with headquarters in WAEMU (proposition) and the implementation by a competent body or an association of competent bodies. The WAEMU specially-tasked unit should propose the KLC-formation studies in the following prioritised ecosystems:

- Wetland ecosystems in the Savanna ecotype (e.g. Hadejia-Nguru wetlands and Lake Chad Basin) so as to prevent the further decline of wetlands and to preserve the Afrotropical-Palaearctic and intra-African bird migrations;
- New and/or larger KLCs and KCAs to protect wildlife ecosystems in the Forest and Mangroves/Coastal ecotypes. In the case of marine-coastal PAs the planning should take place in collaboration with the strategic plan for marine protected areas on the Atlantic coast (as an implementation of the Abidjan Convention).

Further information on the resources required to implement the proposed studies on formation of new KLCs and KCAs, and on wetlands, is presented in Section 5.1 under the 'Specific strategies and actions' given for each major ecotype.

5.1.9 Wildlife protection training

One of the principal threats to the survival of wildlife in WA is the unsustainable hunting and poaching of wild animals. This is related in significant part to the comparatively high human population density and long-established trade networks. On the other hand, given the decline of salaries and the increased incomes from illegal wildlife trade, corruption has also spread amongst the rangers and other staff of the parks. Illegal activities, such as poaching, fishing and logging, have converted some PAs into empty forests or empty savannas that can only be classified as paper-parks.

To reverse this trend, it will be necessary to return to the fundamentals of conservation: first and foremost full control of the parks must be gained by re-establishing the park-management tradition and esprit de corps. To achieve this, it is necessary to build capacity for the protection of wildlife.

For ranger training the following steps are required: (1) identify conservation sites with the capacity to deliver basic training for new rangers; (2) prepare and implement training programmes targeting the specific needs of each specific PA; and (3) support implementation of the appropriate anti-poaching programmes for each PA. Finally, attractive career opportunities for rangers must be assured to enable staff turnover and the welfare of rangers after their period of anti-poaching activities.

These interventions should be carried-out under the coordination of a special task force with its headquarters in WAEMU (proposition) and with their implementation by a competent body or an association of competent bodies.

5.2 PROACTIVE PROCESS

5.2.1 Institutional support and coordination

A strong process of coordination of the wildlife interventions recommended in the strategic approach for Western Africa will be essential to ensure the following synergies: (i) the availability and proper use of resources; (ii) a shared and harmonized implementation between the countries including the necessary agreements for Transfrontier Protected Areas; (iii) the identification and implementation of wildlife protection and law-enforcement agreements across borders and between the Western African and Central African regions; (iv) a stronger balance of conservation initiatives in the major ecotypes of West Africa; and (v) attention to the specificities of conservation at national, regional and interregional levels (e.g. specific plans for highly threatened species, decline in wetlands and mangrove ecosystems).

At present, there is no single organisation in WA that can provide all the services needed for the interventions of conservation in the region. Coordinating the actions for wildlife conservation must therefore also assure the establishment of (i) Institutional, (ii) technical and scientific and (iii) organisational capacities. It is recommended that the institutional reform involves the combination of existing institutions: (1) the West Africa Economy and Monetary Union (WAEMU), (2) the West Africa Protected Areas Network (WAPAN) and (3) a Task-force unit to provide support.

WAEMU is more operational on conservation than ECOWAS. It has the capacity to coordinate the active and proactive processes described above during implementation by Agencies, NGOs, Institutions and Universities, as demonstrated by their expertise in other sectors (agriculture, biosecurity). Furthermore, a conservation unit of WAEMU currently supports a programme of interventions in the WAPOK complex. This strategic approach proposes that this conservation unit is maintained and extended to undertake the coordination of the governance and implementation of the wildlife strategic approach in WA. To achieve these goals, WAEMU must follow the following institutional aspects: (i) promote and coordinate conservation activities in the countries of WA by complying with the regional strategic approach; (ii) support and harmonize policies and laws; (iii) boost the convergence plan (strategic plans) for achieving specific and inter-sectorial interventions in favour of conservation; and (iv) ensure institutional support in the fight against the illegal wildlife trade.

The technical part of the coordination unit must: (i) support technically WAEMU and ECOWAS to fully adopt the principles of the wildlife strategic approach; (ii) upgrade the strategic approach over time; (iii) coordinate with the regional BIOPAMA observatory on making informed decisions about directing funds towards key management priorities and institutions.

It is recommended that WAPAN operate on the technical aspects of conservation: (i) promoting, monitoring and developing the regional strategies; (ii) detecting the needs for planning and managing conservation with regard to landscapes, species and habitats; (iii) identifying and setting up conservation actions on the ground; (iv) monitoring indicators of the key aspects of PA conservation and management effectiveness in collaboration with the BIOPAMA project.

The task force, as a support unit of WAEMU and the WAPAN, must ensure:

- high levels of technical support in collaboration with IUCN Protected Areas Programme for Central and West Africa;
- organisational and financial / administrative support.

The proposed structure composed by WAEMU, WAPAN and the Task-force does not exist and requires a strong investment of one or two years at the beginning of the implementation phase to organise the unit, followed by several years to establish its capacity to intervene in all aspects of conservation in WA. Specifically, WAEMU must evolve from managing priorities for transborder parks to the promotion and the support of transborder and national landscape interventions and to improving the status of key and threatened species and habitats. WAPAN (with the West Africa Marines Protected Areas Network - WAMPAN) must evolve from its role as a representative body of the directors of PAs to a regional technical support body coordinating the institutional parties represented by WAEMU and the international technical and financial institutions. The Task Force must provide technical support and facilitate the mobilization of funds for the conservation initiatives in WA. The task force should be closely advised by the IUCN Programme on African Protected Areas & Conservation (IUCN-PAPACO). The IUCN-PAPACO could offer technical support, experience with capacity building with cross-regional initiatives amongst

neighbouring countries of West Africa, with the mobilization of specialist groups for analysis in decision support systems, and as a partner in the BIOPAMA project. The expertise from the EU and other international partners could ensure a consistent evolution of the strategic approach and help in the mobilization of resources.

The special unit on this strategic approach to conservation in WA (composed by WAEMU – WAPAN – Task force) could assure the promotion and the coordination of the following tasks: (1) Dismantling the wildlife traffic networks; (2) Special analysis; (3) Wildlife protection training; (4) Monitoring and planning; (5) Communication; (6) Biological research; and (7) Management – Governance Training.

5.2.2 Monitoring and planning

The poor performance of wildlife conservation in WA arises from (i) insufficient availability of information on biodiversity, and (ii) a lack of coordination and inter-sectorial approach in the interventions.

Data on conservation in WA are insufficient, and they are not available, structured and oriented as a decision support system. This large deficit in WA conservation capacity can be improved by the use of resources and tools made available by two EU initiatives: (1) the Biodiversity and Protected Areas Management Program (BIOPAMA) (see Box 2) and (2) the Digital Observatory for Protected Areas (DOPA) (see Box 3). The two initiatives are complementary: (i) BIOPAMA strengthens the process of collecting, organizing and structuring information as a decision support system at the local, national and regional levels; (ii) DOPA operates at higher level on informatics infrastructures combined with inter-operable web services connected with the Regional Reference Information System (RRIS) of BIOPAMA. The two initiatives form a Bottom - Up (BIOPAMA) and Top-Down (DOPA) integrated information system as a decision support system at all levels of the interventions on conservation.

BIOPAMA forecasts the establishment of Regional Observatories and the RRIS to improve the access and the availability of data on biodiversity in the four regions of Africa. The BIOPAMA regional observatory for West and Central Africa should: (1) collect and organise existing information; (2) boost the collection of information through the use of a form organized for collecting vital information on the state of conservation, management effectiveness and quality of governance (this last element is scheduled as a future action).

The periodic update of data scheduled by the BIOPAMA observatory could enable West and Central African regions to have baselines and trends of the key aspects of their wildlife and its conservation. The objective will be to base the management effectiveness of wildlife conservation on an information baseline and related benchmarks.

5.2.3 Communication

A major effort in the communication of wildlife and environmental issues is needed in Africa which can be usefully informed by a successful series of awareness campaigns on the illegal wildlife trade in Asia. Awareness raising is particularly needed in WA where there is very little environmental awareness amongst all age groups. Building conservation constituencies to change attitudes and mobilise political support for conservation will require action at many levels:

- Undertake environmental education at both the local level (where the direct threats are occurring) and in the urban areas (where many of the drivers of threats originate and political decisions are made);
- Make greater use of broadcast media and use well known charismatic personalities to deliver conservation messages;
- Implicate international NGOs specialized in environmental education to strengthen and stimulate national NGO environmental education activities;
- Stimulate nature clubs in schools to inspire tomorrow's conservation leaders;
- Create small scale urban natural parks to allow urban community members, who may not have the means to visit or to participate regularly in nature based recreation, to interact with nature and learn about conservation.

The interventions should be carried-out under the coordination of a special task force with headquarters in WAEMU (proposition) and the implementation by a competent body or an association of competent bodies.

5.2.4 Biological research

Knowledge on the biology and threats to West African wildlife remains relatively superficial (for instance, a survey is underway in Togo as we are writing this chapter to ascertain whether or not any chimpanzees still survive in that country). Although sponsoring scientific research may be outside this document's immediate ambit in this instance, the need for more research must not be ignored. **Apart from further surveys on the distribution of and threats to the most endangered species, better genetic data is vital for some conservation priority-setting and decision-making.**

To take one example, it remains a matter of debate how many species of elephant should be recognized in Africa. The IUCN Red List (2013) states:

- Preliminary genetic evidence suggests that there may be at least two species of African elephants, namely the Savanna Elephant (*Loxodonta africana*) and the Forest Elephant (*Loxodonta cyclotis*). A third species, the West African Elephant, has also been postulated. The African Elephant Specialist Group believes that more extensive research is required to support the proposed re-classification. Premature allocation into more than one species may leave hybrids in an uncertain conservation status (IUCN SSC African Elephant Specialist Group 2003).

The African Elephant Specialist Group's statement of 2003 (AfESG 2003) does not appear to have been updated. It recommends that:

- Further analysis of the existing West African samples should be carried out.
- Additional genetic samples from a wider range of sites should be collected and analysed.
- There should be a consensus on the significance of the genetic and morphological data between the scientists working on this issue.

This scientific issue needs urgent resolution, both for conservation priority-setting and for the design of legislation affecting protection and trade. It is especially important to understand the distinctiveness of West African elephants, which are now so rare. The Conference of the Parties (CoP) to CITES agreed in their meeting in Bangkok in March 2013 that the DNA testing of large ivory seizures should be mandatory. For such testing to be of full value **the evolutionary genetics of all African elephants (at the DNA level) needs to be well understood as a matter of urgency.**

The interventions should be carried-out under the coordination of a special task force with headquarters in WAEMU (proposition) and the implementation by a competent body or an association of competent bodies.

5.2.5 Management – Governance Training

In the WA region, biodiversity conservation activities are mainly in IUCN category II sites (National Parks). Other categories of protected area and governance systems are largely overlooked for biodiversity conservation. In WA the focus has traditionally been on highly centralized management with a strong accent on law enforcement which requires substantial resources. Less than a hundred PAs have permanent staff and resources, and these are generally insufficient. Given the current difficulties and constraints in terms of resources, policymakers are looking towards a more decentralized and diversified approach to PA management, including greater community involvement. The new approach requires new skills, particularly for planning and implementation of cross-sectorial and participatory management for conservation and for managing sustainable use of natural resources (hunting, fishing, forestry, Non Timber Forest Products). The new approach enables livelihood issues and poverty reduction to be addressed both in categories IV to VI PAs (where sustainable resource-use is already allowed) and in category II PAs (national parks, where development activities are conducted in the buffer zone). This change in the conservation strategic approach represents a major challenge for biodiversity conservation in WA. The new scenarios require a variety of new management competencies for ensuring the conservation of biodiversity and at the same time to boost the development process of local populations.

Capacity building in the community model of conservation must be organised for the mid-level (senior site officers) and high-level officers (senior government officers and other wildlife professionals working in conservation, education and environmental sectors). The most important capacity-building institutions are: (1) the “École Régionale d’Aménagement intégré des Forêts et Territoires tropicaux (ERAIFT) in Kinshasa – DRC and (2) the “École de Faune of Garoua” (EFG) in Cameroon. Neither institution is able to provide direct and specific support for implementation of the wildlife strategic approach in WA. This strategic approach recommends an intervention to strengthen these institutions for the creation of specific conservation courses for mid-level and high-level officers from WA.

Finally attractive career opportunities in conservation must be created if PAs are to attract and retain quality staff. If capacity building of staff is not accompanied by attractive career conditions the brightest managers will continue to seek employment elsewhere.

The interventions recommended here should be carried-out under the coordination of a special unit with headquarters in WAEMU (proposition) and the implementation by a competent body or an association of competent bodies.

5.3 CONCLUDING RECOMMENDATIONS

Halting or reducing biodiversity loss requires tackling both indirect and direct drivers of biodiversity loss. The direct drivers can be divided into general and specific. General direct drivers apply across the region of WA and in some cases to all of Africa. Specific direct drivers are formulated for each of the four major ecotypes: (1) Deserts; (2) Savannas; (3) Forests and (4) Mangroves (and coastal areas).

5.3.1 Recommendations for tackling key indirect threats to conservation

There are several factors in West Africa that mitigate against effective conservation actions: (1) high political and security instability; (2) rapid population growth; (3) slow growing economy; (4) permanent food insecurity; (5) significant environmental fragility; (6) high risks from climate change; and (7) insufficient awareness of civil society on wildlife matters. These issues generate an increasing demand for natural resources in the ecosystems, consequently and all the protected areas in WA face pressure from grazing, cultivation, wood harvesting, hunting, fishing, use of water, and extraction of natural medicines. This results in fragmentation, reduction and isolation of PAs in the landscape with habitat loss, intrusion of human infrastructures and overhunting.

The government generally does not invest in PAs: the latter are considered as unproductive areas that are reserved (hence the term “reserves”) for later exploitation. Generally PAs are not viewed as economic and spatial elements of the landscape. Finally PA management is inadequately supported. As a result PAs are exploited for illegal grazing, cutting, agriculture, fishing, and poaching, sometimes with the complicity of PA rangers. In the case of breakdowns in law and order, the PAs easily become targets for refugees and rebel groups or are used as sources of funding and illegal trading by rebel groups and religious fundamentalist movements.

Possible global solutions to indirect drivers must be linked to issues of livelihoods, including the sustainable use of natural resources and the exploitation of non-use values of biodiversity and ecosystems. Focusing exclusively on responses and values at one level (e.g. provisioning economic services) often hinders responses that could promote wider values (e.g. livelihood-supporting services and cultural values).

In conclusion, the following actions are recommended for tackling indirect drivers of biodiversity loss:

- Managing protected areas and their surroundings for a wide range of sustainable uses. This is extremely important where, as in West Africa, biodiversity loss is sensitive to changes in key drivers.
- Mainstreaming biodiversity conservation and ecosystem services into all the primary sectors such as agriculture, pastoralism, forestry, fisheries, mining and energy, through an inter-sectorial approach.
- Build the capacity of African governmental and nongovernmental institutions to adopt the new specific and inter-sectorial approaches to conservation (e.g. ERAIFT – Regional postgraduate school for integrated management of natural resources in Sub-Saharan Africa for students and governmental officials from 23 African countries).
- Strengthen the institutions with oversight over the environmental and biodiversity impacts of mining, agro-industry, hydroelectric and other infrastructure projects.
- Support government institutions on questions of internal security (police, forestry, wildlife and/or National Parks departments, and justice) with respect to wildlife law enforcement as part of national programmes and projects financed by donors.
- Capture benefits and reduce costs for local communities, especially the local opportunity costs based on the principle of equitable sharing.
- Increase transparency and accountability of the government and private-sector through the involvement of concerned stakeholders and rights-holders in decision-making on biodiversity issues.
- Public awareness, communication and education.
- Promote and facilitate awareness-building in civil society for wildlife management and protection; support the growth of a network of local non-governmental wildlife organizations in West Africa.

5.3.2 Recommendations for tackling general direct threats to conservation

The wide range of ecosystems in West Africa is what gives it such biological richness and diversity. From the African continental perspective, WA has an enviable natural heritage: (i) largest system of deserts; (ii) most extensive mangrove system; (iii) highest levels of plant and animal species richness of any forest in Africa; (iv) some of the largest and most beautiful antelopes; (v) high levels of endemism; (vi) immense importance for over two million migrant birds (Afrotropical - Palearctic and intra-African migrations). Yet these natural resources and biodiversity are being degraded rapidly due to the complex political and socio-economic situation. In particular, WA governments generally do not give enough importance to PA management for two reasons: (i) inadequate prioritisation of funds; (ii) poor Institutional governance. The results are: (i) a weak planning, management effectiveness and monitoring of PAs and (ii) illegal wildlife trade and corruption.

Recommendations to tackle general direct drivers of biodiversity decline are as follows:

Availability of funds for PAs

- Increase the opportunity for more private sector investment and sponsorship in management, eco-tourism activities and in valuing ecosystems services (Payments for Ecosystem Services – PES).
- Plan for long-term financial sustainability for each PA by extending the time frame of interventions and strengthening the inter-sectorial approach for community support (to reduce threats and, indirectly, surveillance costs).

Institutional governance of PAs

- Seek more efficient structures that avoid duplication in natural resource management. This will require creating inter-sectorial guidelines on natural resource management and biodiversity conservation at national and regional levels (convergence in legislation, strategies and planning).
- Create parastatal bodies, and link the wildlife skills of national and international NGOs, natural resource rights-holders and the private sector.
- Integrate aspects of wildlife and habitat management in national forestry policies for logging concessions.

Illegal wildlife trade and corruption

- Seek greater support for law enforcement with better equipped and trained anti-poaching units, and greater integrity of wildlife officers, police, army and justice.

Specific measures for West Africa Elephant:

- Highlight the importance of the WAP complex to ensure the survival of WA's most important elephant population.
- Evaluate viable populations, and provide special protection for them (such as for the elephants at national level and for Zakouma NP in Chad).
- Create and strengthen intelligence gathering services, with monetary incentives for useful information leading to successful anti-poaching results.

Bushmeat

- Develop partnerships involving the private sector, communities, and government agencies for forest and wildlife management in logging concessions. This must include economic alternatives, alternative sources of protein, and wildlife monitoring.

Illegal live wild animal trade (See common solutions above)

Weak planning, management effectiveness and monitoring of PAs

- Improve data collection to build a more effective monitoring and decision support system (objectives – indicators – benchmarks) that facilitates adaptive management and proactivity;
- Emphasize the role of stakeholders and natural resource rights-holders, national and international NGOs, private sector operators and other non-traditional partners with a view to enhancing management effectiveness at the ecosystem/landscape scale (PAs and buffer zones);

- Strengthen institutional capacities, particularly through greater training opportunities, for protected area management at the local, national and regional levels.

5.3.3 Recommendations for tackling specific direct threats to conservation

The major recommendation to overcome both general and specific threat to conservation in Western Africa in the medium term is to invest in a comparatively small number of Key Landscapes for Conservation (KLCs) that have the capacity to conserve viable populations of the large and charismatic wildlife species within intact and self-sustaining ecosystems. This will greatly assist in reversing the decline of threatened species and the loss of biodiversity in the region. Our proposals for conserving 14 KLCs are summarised in Table 27 and Figure 14.

On a short-term basis, we further recommend that conservation efforts are focussed on Key Conservation Areas to stem the wildlife emergency which threatens to bring about the extinction of WA lions and other key wildlife species (Table 27).

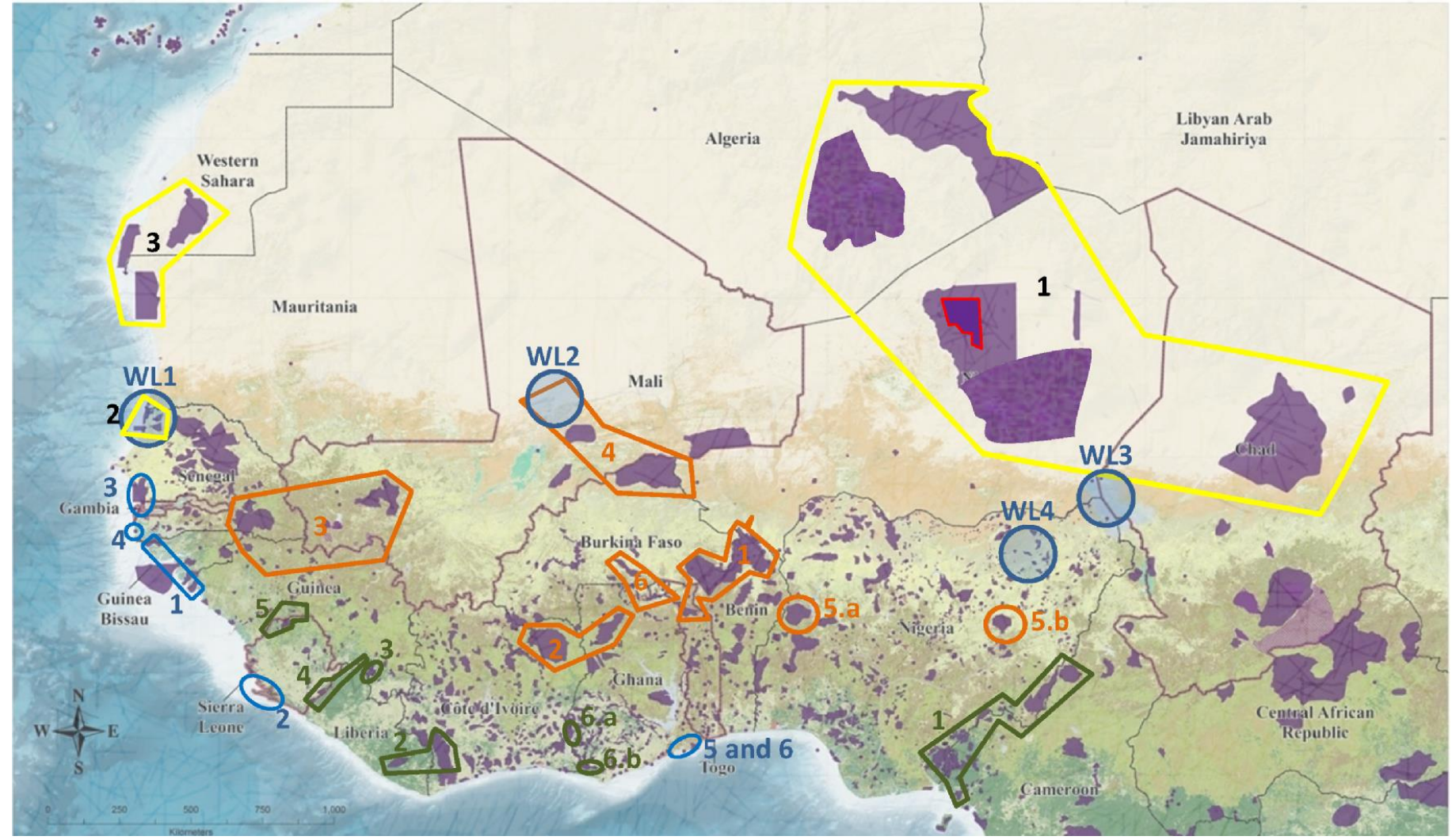
Table 27. Summery table of Key Landscapes for Conservation (KLCs) and Key Conservation Areas (KCAs), and priorities for WA

N. KLC	N. KCA	KLCs and KPAs and priorities		N. PAs	Surface km ²
		Deserts Major Ecotypes	Totals Deserts	13	453,065
1		1. NCA - Termit & Tin Toumma NNR; Air and Ténéré NP; Addax Sanctuary NNR; Ouadi Rimé-Ouad NP; Fada Archei NP; Tassili-n-Ajjer NP and Ahaggar NP		7	416,750
2		2. SMWL1 - Diawling NP – Djoudj NP-WL1; Saint-Louis MPA; Ndiel Wildlife Reserve and Keur Momar Sarr Forest Reserve		4	2,465
3		3. MWS - Banc d'Arguin NP; Réserve Intégrale de Cap Blanc NNR and Dakhla NP		3	33,850
		Savannas Major Ecotypes	Totals Savannas	18	119,971
4		1. WAPOK: W transborder park; Pendjari NP; Arly Faunal Reserve; Oti Monduri Faunal Reserve and Keran NP		7	38,000
5		2. CM: Comoé NP – Mole NP		2	16,571
6		3. NBBBFF: Niokolo Koba NP - Badiar NP- Bafing NP – Boucle du Baoulé NP – Falémé area NC – Fouta Djallon area NC		4	25,000
7		4. GS: Gourma Elephant NP, Sahel Faunal Reserve and Inner Niger IBA		2	26,500
	1	5. LION KCAs: Kainii Lake NP and Yankari NP		2	8,200
8		6. VC: Volta Trans-Border Ecosystem Wildlife		1	3,700
		Avoid the decline of wetlands		?	(1-3,000)
		Forests Major Ecotypes	Totals Forests	17	37,395
9		1. CKTGTF: Cross River NP; Korup NP; Mont Cameroon; Tamakanda NP; Gashaka-Gumti NP; Tchabel Mbabo Wildlife Reserve and Faro NP		6	19,100
10		2. TGS: Taï NP; Nzo Faunal Reserve; Grebo National Forest; Sapo NP		3	7,700
11		3. MN: Nimba Mountains Strict Nature Reserve and East and West Nimba Nature Reserve in Liberia		3	415
12		4. GLF-MWWZ: Gola- Lofa - Foya Forest Reserves Trans-border Park; Mano NF, Wologizi NF; Wonegizi NF and Zياما MAB		3	4,400

N. KLC	N. KCA	KLCs and KPAs and priorities		N. PAs	Surface km ²
13		5. OKKPS: Outamba-Kilimi NP and Forest Reserves Kuru Hill (in Sierra Leone) and Pinselli and Soya (in Guinea)		1	1,100
	2	6. Forest KCAs: Ankasa NP; Bia NP		2	680
		New or larger KLC and KCA (Liberia, Ghana, Nigeria)		?	(3-5,000)
		Mangroves/Coastal Major Ecotypes	Totals Mangroves	3	9,592
14		1. CCCBT: Rio Cacheu Mangroves NC; Lagoas de Cufada NC; Rio Grande de Buba NC; Cantanhez Forest NC and Iles Tristao NC		0	4,780
	3	2. Mangroves KCAs: Sherbro et Turtles Islands NC; Saloum Delta NP; Basse Casamance NP; Keta Lagoon Ramsar site; Songor Lagoon NC		3	3,062
		New or larger KLC and KCA (Nigeria, Ivory Coast, Liberia, Sierra Leone, Senegal, Guinea)		?	(1,5-2,000)
		Totals West Africa		51	620,000

Figure 14. Summary figure of West Africa - Main KLCs and KCAs, Wetlands and conservation priorities by Ecotypes

A) Deserts, yellow color; (B) Savannas, orange color; (C) Forests green color and (D) Mangroves/Coastal, blue color; WL Number - priority of intervention in Wetlands (map sources: Climate Change and Protected Areas in West Africa – CCPAWA, UNEP - World Conservation Monitoring Centre, 2010; specific elaboration)



The KLC and KCA protected area approach must be integrated with recommendations for specific direct drivers formulated for each of the four major ecotypes: (1) Deserts; (2) Savannas; (3) Forests and (4) Mangroves (and coastal areas).

5.3.3.1 Deserts

- Apply a species approach for Scimitar Oryx, Saharan cheetah, Dama Gazelle, Addax
- Adopt synergistically in situ and ex-situ conservation techniques in order to have the greatest probability of effective conservation.
- Be flexible enough to intervene in areas and countries as soon as security conditions allow.
- Save the habitat in which the species can live and reproduce (with PAs and KLCs).
- Preserve and improve the genetic heritage (DNA), under the responsibility of WAZA, with a view to future reintroduction of the species in their natural habitats. It is essential that these habitats remain occupied by the conservation services until such time as the reintroductions can take place.
- Exploit every possibility in land surveys (including information from the military) for better protection (and knowledge) of wildlife.

5.3.3.2 Savannas

- Establish a convergence plan of conservation interventions in this ecotype.
- Save the WAP(OK) ecosystem, the only functional ecological complex to have a potential for regeneration and reintroduction of species in the savanna ecotype.
- Preserve the most important ecological blocks of protected areas: (i) Comoe – Mole (Côte d'Ivoire and Ghana); (ii) Niokolo - Badiar - Bafing – Faleme –Fouta Djallon (Guinea, Mali, Senegal) and (iii) Gourma Elephant and Sahel Faunal Reserve (Mali and Burkina Faso) even if wildlife densities are low.
- Establish transborder corridors between major ecological blocks such the Volta Trans-Border Ecosystem Wildlife Corridors between Burkina Faso and Ghana.
- Support cross-border activities such as in WAPO complex (or WAPOK with the inclusion of Park Keran) or new management initiatives such as the Volta Trans-Border Ecosystem Wildlife Corridors between Burkina Faso and Ghana.

5.3.3.3 Forests

- Concentrate actions in the principal PAs, with equal priority for all the sites given their biological diversity and richness.
- Create new or enlarged national protected areas (Liberia, Ghana and Nigeria) in the important forest blocks to complement the overall biodiversity protection of this ecotype. Fill in information gaps (and scientific knowledge) and establish priorities, objectives, indicators and benchmarks for conservation actions.
- Reduce threats to PAs by adopting a systems approach to ensure inter-sectorial policy and development activities, analysis of environmental impacts, the valuing of ecosystem services and the respect of conservation principles.
- Determine the most appropriate conservation actions for threatened species (by the establishment of PHVA analysis if necessary), the preservation of specific habitats inside or outside PAs, and the combination of in-situ and ex-situ conservation.
- Create the political will to tackle conservation problems.

5.3.3.4 Mangroves

- Apply legislations and international conventions related to mangroves, and adopt adequate policies and inter-sectorial approaches for implementation of actions.
- Concentrate actions in priority PAs and community mangrove forests.
- Create new or enlarged national protected areas (Nigeria, Ivory Coast, Liberia, Senegal, and Guinea) and develop an integrated PA and Reserve network of coastal and marine areas encompassing mangrove and other coastal habitats. Collaborate with national and international NGOs and empowered local communities to maintain and monitor the community mangrove areas.
- Develop an integrated PAs and Reserves network of coastal and marine areas encompassing mangrove and other coastal habitats.
- Establish a fund to maintain sustainable economies that are based on the ecologically sustainable management of mangroves and coastal habitats.
- Determine the most appropriate research and conservation actions for improving management effectiveness of PAs and mangrove forests and related threatened species.

6. ANNEXES

6.1 ANNEX 1. WEST AFRICA DATA MISCELLANEOUS

Table 28. Population, Annual Growth (%) and Estimated doubling time of population of WA

Country	July 1, 2013 projection	Average relative annual growth (%)	Estimated doubling time (Years)
Benin	9 742 000	3,24	22
Burkina Faso	17 323 000	3,28	21
Gambia	1 794 000	2,75	26
Ghana	26 441 000	2,56	27
Guinea	11 861 000	3,09	23
Guinea-Bissau	1 699 000	2,60	27
Ivory Coast	23 919 000	3,09	23
Liberia	3 881 000	2,10	33
Mali	16 678 000	3,29	21
Mauritania	3 461 000	2,58	27
Niger	17 493 000	3,85	18
Nigeria	177 096 000	3,24	22
Senegal	13 567 000	3,06	23
Sierra Leone	5 823 000	1,84	38
Togo	6 675 000	2,88	24
Total	337 453 000	2,90	25

Table 29. CITES, Countries currently subject to a recommendation to suspend trade (09/09/2013)

Country	Notification	Basis	Common name	Scope	Valid from
Benin	No. 2013/013 (02/05/2013)	Significant trade	Emperor Scorpion	<i>Pandinus imperator</i>	2 May 2013
Cameroon	No. 2013/013 (02/05/2013)	Significant trade	hippopotamus	<i>Hippopotamus amphibius</i>	7 September 2012
Côte d'Ivoire	No. 2013/013 (02/05/2013)	Significant trade		<i>Pericopsis elata</i>	7 September 2012
Guinea	No. 2013/013 (02/05/2013)	Significant trade	Black crowned-crane	<i>Balearica pavonina</i>	2 May 2013
	No. 2013/017 (16/05/2013)	Compliance and enforcement		All commercial trade	16 May 2013
Mali	No. 2013/013 (02/05/2013)	Significant trade	Cape Parrots	<i>Poicephalus robustus</i>	9 July 2001
			Mali Spiny-tailed Lizard	<i>Uromastyx dispar</i>	22 August 2008
Mauritania	No. 2004/055 (30/07/2004)	National legislation		All commercial trade	30 July 2004
Niger	No. 2013/013 (02/05/2013)	Significant trade	African chameleon	<i>Chamaeleo africanus</i>	30 July 2004
Togo	No. 2013/013 (02/05/2013)	Significant trade	Cape Parrots	<i>Poicephalus robustus</i>	9 July 2001
	No. 2013/013 (02/05/2013)	Significant trade	Emperor Scorpion	<i>Pandinus imperator</i>	2 May 2013

Table 30. The biodiversity features of West Africa

		Biodiversity						Threat % of land transformed	Response % of land protected
		Mammals		Birds		Plants			
Country	Area km²	Endemic	Total	Endemic	Total	Endemic	Total		
Benin	11 2620	0	188	0	503	0	2 500	9	6
Burkina Faso	2 740 00	0	147	0	447	-	1 100	48	12
Cape Verde	4 030	0	5	5	87	86	774	-	-
Gambia	11 303	0	117	0	666	Not known	974	42	0
Ghana	238 540	1	222	0	447	43	3 725	17	5
Guinea	245 860	1	190	0	676	88	3 000	14	0
Guinea-Bissau	36 120	0	108	0	628	12	1 000	7	-
Côte d'Ivoire	322 460	0	230	0	454	62	3 660	25	6
Liberia	111 370	0	193	1	536	103	2 200	30	1
Mali	1 240 190	0	137	0	561	11	1 741	15	4
Mauritania	1 025 520	1	61	0	459	Not known	1 100	3	0
Niger	1 267 000	0	131	0	433	Not known	1 460	2	8
Nigeria	923 770	4	274	3	848	205	4 715	34	4
Senegal	196 720	0	192	0	546	26	2 086	47	11
Sierra Leone	71 740	0	147	0	581	74	2 090	38	2
Togo	56 790	0	196	0	551	Not known	3 085	7	8
All countries	6 138 030	7		9		710		16%	4%

Note: Sources: Biodiversity information taken from Groombridge and Jenkins (2002). Calculation of the proportion of transformed land was based on the reclassification by Hoekstra and others (2005) of the GLC3 Global Landcover Classification (Mayaux and others 2004). Hoekstra and others (2005) defined four classes of transformed land: 1) Artificial surfaces and associated areas, 2) Cultivated and managed areas, 3) Mosaic: cropland/treecover, and 4) Mosaic: cropland/ other natural vegetation. In this chapter, all four classes have been integrated into the calculation of the proportion of transformed land. The area covered by classes 3 and 4 was divided by two, assuming that this reflects their mosaic character with a certain proportion of land remaining untransformed. Note that this method does not account for the degree of fragmentation within the mosaic landcover classes. Data on protected areas (IUCN class I-V) were obtained from WRI 2005

Table 31. International protected areas in West Africa

Country	Biosphere reserve		World heritage sites		RAMSAR sites		Important Bird Areas		Endemic Bird Areas
	Number	Area Km ²	Number	Area Km ²	Number	Area Km ²	Number	Area Km ²	Number
Benin	1	6 230	0	0	2	1 390	6	14 901	0
Burkina Faso	1	1 860	0	0	3	2 990	10	16 279	0
Cape Verde	-	-	-	-	-	-	15	4 685	1
Côte d'Ivoire	2	14 800	3	15 040	1	190	14	23 221	1
Gambia	0	0	0	0	1	200	13	585	0
Ghana	1	80	0	0	6	1 780	40	16 076	1
Guinea	2	1 330	1	13	6	2 250	18	7 078	1
Guinea-Bissau	1	1 100	0	0	1	390	8	7 578	0
Liberia	0	0	0	0	0	0	9	6 302	1
Mali	1	23 490	1	4 000	3	1 620	17	28 692	1
Mauritania	0	-	1	12 000	2	12 310	24	17 906	0
Niger	2	251 280	2	79 687	4	7 150	15	83 431	0
Nigeria	1	<1	0	0	1	580	27	32 468	4
Senegal	3	10 940	2	9 290	4	1 030	17	25 799	1
Sierra Leone	0	-	0	0	1	2 950	10	6 149	1
Togo	0	0	0	0	2	1 940	4	5 085	0
Total	15	311 110	10	120 030	37	36 740		296 235	12

Note: Source: Data from Wetlands International undated, UNESCO 2006a, UNESCO 2006b

Table 32. Biome and ecotype of the WA countries

	Biome	Ecotypes	Benin	Burkina Faso	Côte d'Ivoire	Gambia	Ghana	Guinea	Guinea-Bissau	Liberia	Mali	Mauritania	Niger	Nigeria	Senegal	Sierra Leone	Togo
Realms: Palearctic	Deserts and xeric shrubland	A. Deserts															
		Sahara Desert															
		Atlantic coast															
		South Saharan steppe and woodlands															
		West Saharan montane xeric woodlands															
Realms: Afrotropics	Tropical and subtropical grasslands, savannas, and shrublands	B. Savannas															
		Sahelian Acacia savanna															
		West Sudanian savanna															
	Montane Grasslands and Shrublands	Guinean forest-savanna mosaic															
		Jos Plateau forest-grassland mosaic															
	Tropical and subtropical moist broadleaf Forests	C. Forests															
		Guinean Montane Forests															
		Western Guinean lowland forests															
		Eastern Guinean forests															
		Nigerian lowland forests															
		Cameroonian Highlands forests															
		Cross-Sanaga-Bioko coastal forests															
		Niger Delta swamp forests															
		Cross-Niger transition forests															
	Mangroves	D. Mangroves															
		Guinean Mangroves															
		Central African mangroves															

Table 33. WA, Countries data, Source: Africa Development Indicators

WB Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	TREND
Population growth (annual %)	3.1	3.3	3.5	3.5	3.4	3.2	3.0	2.8	2.7	2.8	2.9	3.1	3.2	3.2	3.2	3.1	3.1	3.0	3.0	2.9	2.8	2.8		=
Population in the largest city (% of urban population)	30.6	30.4	30.0	29.2	28.4	27.8	27.3	26.9	26.5	26.1	25.7	25.1	24.5	24.0	23.4	23.0	22.6	22.2	21.9	21.7	21.6	21.4		↘
GDP growth (annual %)	9.0	4.2	3.0	5.8	2.0	6.0	4.3	5.7	4.0	5.3	4.9	6.2	4.4	3.9	3.1	2.9	3.8	4.6	5.0	2.7	2.6	3.5		=↗
GDP per capita growth (annual %)	5.6	0.8	-0.6	2.2	-1.4	2.7	1.3	2.8	1.1	2.4	1.8	3.0	1.2	0.6	-0.1	-0.3	0.6	1.5	2.0	-0.3	-0.3	0.7		=↘
GNI growth (annual %)	2.9	4.2	5.2	2.6	4.7	4.6	5.4	5.4	3.7	4.8	5.7	5.4	4.5	4.2	2.9	2.5								↙
Corruption Perceptions Index (score)															3.2	2.9	2.5	2.7	3.1	2.9	2.8	3.0	36.0	↑
International tourism, expenditures (% of total imports)																5.1	5.1	5.1	4.3	3.9	4.0			↘
3rd pillar: Macroeconomic stability																	4.0	4.7	4.6	4.8	4.5	4.9		=
Terrestrial protected areas (% of total surface area)	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8			=
Forest area (% of land area)	51.1	50.5	49.8	49.2	48.6	48.0	47.4	46.7	46.1	45.5	44.9	44.4	44.0	43.6	43.1	42.7	42.2	41.8	41.3	40.9	40.4	40.0		↓
Agricultural land (% of land area)	20.1	20.2	20.4	20.6	21.3	22.3	24.0	25.6	27.0	27.6	28.3	29.0	29.8	30.7	31.6	31.2	29.6	29.6	30.6	29.3	30.1	30.4		↑
Population density (people per km ² of land area)	42.3	43.8	45.3	46.9	48.5	50.1	51.6	53.1	54.6	56.1	57.8	59.6	61.5	63.5	65.6	67.7	69.8	71.9	74.1	76.3	78.5	80.7		↑

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CENTRAL AFRICA

Western lowland gorilla, an iconic species of the Central African rainforests. An adult male displays in a forest clearing in Odzala-Koukoua National Park, Congo. Photo © Sylvain Gatti & Florence Levréro, CNRS, Station Biologique Paimpont-Université de Rennes



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ACRONYMS

AALF	Appui à l'Application de la Loi sur la Faune
ABC	Amis des Bonobos du Congo
ADB	African Development Bank
AECID	Agencia Espanola de Cooperacion Internacional para el Dearrollo (Spain)
AFD	Agence Française de Développement
AFRICOM	United States Africa Command
ANPN	Agence Nationale des Parcs Nationaux
AWF	African Wildlife Foundation
BAK	Biodiversité au Katanga
BCI	Bonobo Conservation Initiative
BIOPAMA	Biodiversity and Protected Areas Management in African, Caribbean and Pacific countries
BMZ	Federal Ministry for Economic Cooperation and Development (Germany)
CAR	Central African Republic
CAFEC	Central African Forest Ecosystem Conservation
CARPE	Central African Regional Programme for the Environment
CAWHFI	Central African World Heritage Forest Initiative
CBFP	Congo Basin Forest Partnership
CBNRM	Community Based Natural Resource Management
CBCSP	Community Based Conservation Security Partnerships
CIB	Congolaise Industrielle du Bois (now OLAM)
CITES	Convention for the International Trade in Endangered Species
CI	Conservation International
CIFO	Center for International Forestry Research
COMIFAC	Commission des Forêts d'Afrique Centrale
DFGF	Dian Fossey Gorilla Fund
EAGLE	Eco Activists for Governance and Law Enforcement
ECCAS	Economic Community of Central African States (CEEAC in French)
ECOFAC	Programme Régional de Conservation et Utilisation Rationnelle des Ecosystèmes Forestiers d'Afrique Centrale
EFG	École de Faune de Garoua (Garoua Wildlife College – Cameroon)
ENF	École Nationale des Eaux et Forêt du Gabon
ERAIFT	École Régionale Post-Universitaire d'Aménagement et de Gestion Intégrés des Forêts et Territoires Tropicaux (DRC)
FAO	Food and Agriculture Organisation
FB	Fundacion Biodiversidad
FFI	Fauna and Flora International
FFEM	Fonds Français pour l'Environnement Mondial
FLEGT	Forest Law Enforcement, Governance and Trade
FSC	Forest Stewardship Council
FTNS	Fondation Tri National Sangha (TNS Trust Fund)
FZS	Frankfurt Zoological Society
GEF	Global Environment Fund
GIZ	Deutsche gesellschaft für technische Zusammenarbeit (German technical cooperation)
GIC	Gilman International Conservation
GRASP	Great Apes Survival Partnership
HGBF	Howard G. Buffet Foundation
ICCN	Institut Congolais pour la Conservation de la Nature
INCEF	International Conservation and Education Fund
INTERPOL	International Criminal Police Organization
IUCN	International Union for Conservation of Nature
KfW	Kreditanstalt für Wiederaufbau (German financial cooperation)
KLC	Key Landscape for Conservation
LAGA	Last Great Ape Alliance
LEM	Law Enforcement Monitoring
LRA	Lord's Resistance Army (a rebel group of Ugandan origin)
MAAMA	Ministerio de Agricultura, Alimentcion y Medio Ambiente (Spain)
MECNT	Ministère de l'Environnement, Conservation de la Nature et Tourisme
MINEF	Ministère des Eaux et Forêts
MIKE	Monitoring of Illegal Killing of Elephants

MIKES	Minimising the Illegal Killing of Elephants and other Endangered Species
MIST	Management Information System
MF	Murray Foundation
NCU	National Coordinating Unit
NGO	Non-Governmental Organisation
NTFP	Non Timber Forest Products
NP	National Park
NICFI	Norway's International Climate and Forest Initiative
OFAC	Central African Forest Observatory
PALF	Projet Appui à l'Application de la Loi sur la Faune
PAPECALF	Plan d'Action sous-régional des Pays de l'Espace COMIFAC pour le renforcement de l'Application des Législations nationales sur la Faune sauvage
PROGEPP	Projet de Gestion de la Périphérie du Parc National de Nouabalé-Ndoki
PREPAN	National Parks Rehabilitation Project (World Bank)
PNNN	Parc National de Nouablé-Ndoki
PNKB	Parc National de Kahuzi-Biega
PPP	Public Private Partnership
RDC	République Démocratique du Congo
REDD	Reducing Emissions from Deforestation and forest Degradation
RAPAC	Réseau des Aires Protégées d'Afrique Centrale
RFO	Réserve de Faune à Okapi (Okapi Wildlife Reserve)
SCAEMPS	Strengthening Central African Environmental Management and Policy Support
SI	Smithsonian Institute
SIV	Simian Immunodeficiency Virus
SMART	Self-Monitoring, Analysis and Reporting Technology
SSC	Species Survival Commission
SYVBAC	SYstème de suivi de la filière Viande de brousse en Afrique Centrale
TL2	Tshuapa-Lomami-Lualaba
TNS	Tri National Sangha
TRIDOM	Trinational Dja Odzala Minkébé
UNESCO	United Nations Education, Science and Culture Organisation
UNODC	United Nations Office on Drugs and Crime
UNEP	United Nations Environment Programme
USAID	Agence de coopération des Etats-Unis
USFWS	United States Fish and Wildlife Service
WHS	World Heritage Site
WWF	World Wide Fund for Nature
WCS	Wildlife Conservation Society
WCO	World Customs Organisation
WWF	World Wide Fund for Nature
ZSL	Zoological Society of London
ZSM	Zoological Society of Milwaukee

EXECUTIVE SUMMARY

The strategy is organised into six sections: (0) the overall rationale for the proposed EU strategic approach for wildlife conservation; (1) an introduction to the wildlife and habitats of Central Africa; (2) a review of challenges, threats and drivers of threats; (3) a review of ongoing conservation efforts; (4) lessons learnt and promising approaches particularly with respect to the landscape approach to protected area management, partnerships with the private sector, engagement with local communities, and law enforcement; (5) indicative conservation actions to achieve long-term wildlife conservation in Central Africa.

Section (0) sets out the rationale for an EU strategic approach for wildlife conservation in Africa by underlining the hitherto underappreciated scale of the wildlife crisis in Africa and the fact that with the burgeoning human population pragmatic strategic choices will have to be made as it will not be possible to conserve everything. Protected areas (PA) must therefore be at the heart of any strategic approach to wildlife conservation as these are the areas where the most intact assemblages of Africa's wildlife are found.

Section (1) describes the main natural habitats and ecosystems of Central Africa and the status of wildlife in the region. It describes the moist tropical forests that dominate Central Africa (including the volcanic islands in the Gulf of Guinea), the biodiversity rich moist forest-savanna transition zones, the sahelian savannas and woodlands to the north of the moist forest block and the miombo woodlands to the south. The moist forest block is by far the most extensive area of continuous forest in Africa and contains the planet's largest area of swamp forest. The Central African forests are characterised by high levels of endemism including several iconic species such as 4 sub species of gorillas, bonobos and okapi. They also represent a gigantic carbon sink and strongly influence local weather patterns. The generally intact nature of vast areas of habitat outside protected areas in Central Africa, particularly in the moist forest zone, together with the generally low human densities, means that it is not too late to do something for conservation.

Section (2) reviews long term threats to Central African wildlife. The commercial bushmeat trade is probably the single most pervasive threat and is leading to defaunation of large tracts of otherwise undisturbed forest ("empty forest" syndrome). The commerce is greatly aided by the industrial logging and mining activities which provide easy and rapid access for hunters deep into the most remote forest blocks. Habitat loss through deforestation, principally from shifting agriculture and fuelwood and charcoal collection, is a threat although deforestation rates are lower than anywhere else in Africa. Land grabbing for agro-industrial plantations, particularly oil palm, is a growing threat. The most important drivers of these threats are population growth, poverty and poor governance. Insecurity of land tenure and resource user rights and armed conflict are also important drivers. Finally insecurity and conflict have plagued the region for decades and have had a devastating effect on capacities to manage PAs and protect wildlife.

Section (3) reviews ongoing conservation efforts. The Central African Commission for Forests (COMIFAC) and the Congo Basin Forest Partnership (CBFP) provide the strategic framework for regional cooperation and donor collaboration in Central Africa. The section reviews the key bi and multi-lateral donors and conservation NGOs operating in Central Africa.

Section (4) reviews lessons learned and promising approaches. The key lesson is that PAs contain the most intact assemblages of wildlife and biodiversity and that the PAs where biodiversity is being most effectively protected are those that are receiving long term support from donor agencies and their technical partners. Public Private Partnerships (PPP) for management of PAs offer good opportunities for strengthening PA management in Central African countries where PA management capacities are very weak. The landscape approach, targeting groups of PAs and the areas linking them (including transfrontier conservation areas), significantly enhances conservation outcomes because habitats, particularly in the moist forest block, remain relatively intact. Promising opportunities exist for partnerships with private sector logging and mining operators whose concessions cover the majority of the forests linking PAs and who are required to integrate conservation measures in their legally binding management plans. Building constituencies for conservation among local communities has proved challenging because forest peoples are highly individualistic in their approach to natural resource use. Insecurity of land tenure further complicates the situation and contributes to situations of "open access" to resources resulting in overexploitation. There are few examples of successful livelihoods programmes that contribute to more sustainable natural resource use in Central Africa. Furthermore the "conservation-linked-to-development" paradigm that dominates modern biodiversity conservation thinking has resulted too often in conservation projects having to address all the socio-economic ills of populations living around protected areas, despite rarely having either the financial resources or the expertise to do this. Finally no lasting progress in wildlife conservation can be achieved if there is no political will at the very highest level.

Section (5) outlines a plan for achieving long term wildlife conservation in Central Africa. Long term support for Key Landscapes for Conservation (KLC) containing Central Africa's most important PAs is the central pillar of the plan since these are the areas that have the greatest chance of surviving the many pressures on wildlife and natural resources in the coming years. Priority is given to sites harbouring the most intact assemblages of Central African wildlife. World Heritage Sites (WHS) are also a priority by virtue of their WHS status which recognizes their global importance for nature conservation, as are sites which are on the countries' Tentative Lists for WHS status or which protect specific globally important features not found elsewhere. In total some 60 PAs are included in the KLCs identified. Three particularly important KLCs, all of which are also Transfrontier Conservation Areas (TFCA) are (i) Greater Virunga KLC (overlapping with Eastern Africa region) along the Albertine Rift which encompasses 11 PAs including 3 WHS, (ii) the Greater TRIDOM-TNS KLC encompassing 14 PAs including 3 WHS, and (iii) Gamba-Mayumba-Conkouati KLC encompassing 4 PAs. Between them these three KLCs protect a substantial proportion of Central Africa's floral and faunal diversity. They also include most of the priority areas identified in the Action Plans for gorillas and chimpanzees and encompass the majority of Africa's remaining forest elephants, of which Gabon alone probably holds 50%. These large KLCs also offer good opportunities for reinforcing existing, and developing new, public private partnerships (PPP) for PA management as well as for developing PPPs with the mining and logging sector for wildlife conservation and sustainable livelihood activities in the intervening buffer zones.

While on-the- job training will always be an important component of support to PAs, the major constraint to effective PA management is the weakness of the PA management authorities and the absence of career opportunities to encourage competent conservation practitioners (at all levels) to join the authority and stay with it to make their career. Support for institutional strengthening and/or reform of national PA authorities should therefore be a strategic priority of this plan.

Actions to dismantle wildlife crime networks are also key components of the plan and should focus on three themes (i) building collaboration between organizations and agencies; (ii) strengthening law enforcement; (iii) properly penalizing wildlife crime. COMIFAC's regional law enforcement action plan should be supported, as should the important efforts of NGO Wildlife Enforcement networks.

Lastly the issue of the unsustainable bushmeat trade must be addressed. Although there are no neat solutions to this intractable problem it cannot be ignored either. Most bushmeat is consumed in urban areas where it is more of a "luxury" item than for rural populations where it is more of a food security issue. The plan identifies three areas where action must be taken (i) reducing the demand for bushmeat including developing alternative sources of protein at a cost similar to bushmeat, (ii) improving the sustainability of the supply by better management of the resource, (iii) creating a conducive enabling institutional and policy environment so that local resource users have a secure stake in the resource and an incentive to manage it sustainably.

0 RATIONALE

The impetus for developing the strategic approach proposed in these volumes has come from the growing global awareness of a wildlife crisis in Africa. Although the much publicised plight of the African elephant and rhino has placed the issue at the forefront of international debate, conservation practitioners working on the ground in Africa have known for a long time that the wildlife crisis is by no means limited to a few iconic African wildlife species which are only the visible portion of an iceberg that hides a steady erosion of wildlife over a wide range of species in all biomes. The scale of the wildlife crisis is immense and one of the main aims of this document is to underline (a) just how much needs to be done and why, (b) what are likely to be the most realistic and effective strategic priorities for saving Africa's wildlife heritage, given the rate of human population growth and associated habitat loss. It is also hoped that the document will serve as a way of federating the different wildlife conservation actors, both within and outside Africa, around a balanced series of common themes.

One of the key points that emerges from the following is that the pressure on land and natural resources in Africa has increased conspicuously in recent decades, and is set to increase considerably more as a result of ongoing demographic and economic trends; more than ever before, Protected Areas have to be at the heart of any strategic approach to wildlife conservation as these are the areas where the most intact assemblages of Africa's wildlife are found. A second key point is that African people living in wildlife-rich areas need to have tangible benefits in the preservation of Africa's wildlife if they are (a) to accept the costs of living with it and (b) be able to continue using it sustainably. Thirdly, efforts to tackle the international illegal trade require concerted actions to stop the killing, stop the trafficking and stop the demand for wildlife and forest products. Fourthly good quality and up-to-date information is essential in order to inform the choice of strategic options and monitor outcomes. Lastly, all of the above will require a whole raft of institutional, policy and legal improvements or changes to occur in parallel.

Combining the above considerations brings us to an overall objective, or desired outcome, for the strategic approach to wildlife conservation:

A full suite of viable populations of the unique wildlife heritage of Sub-Saharan Africa maintained in healthy, functioning and resilient ecosystems supporting livelihoods and human development.

Thus the strategic approach developed herein is primarily targeted at the conservation of large functioning ecosystems or landscapes supporting key African wildlife populations. It contributes to wider goals of biodiversity conservation by, for example, protecting many small areas of outstanding importance to particular threatened taxa where those small areas fall within larger conservation landscapes. A secondary tactic supporting wider biodiversity goals is to make conservation funds available to agencies and projects protecting small important sites that cannot be contained in the large key landscapes identified.

The Strategic Approach to Wildlife Conservation in Africa is presented in six volumes as follows:

- Volume 1: Synopsis**
- Volume 2: Southern Africa**
- Volume 3: Eastern Africa**
- Volume 4: Central Africa**
- Volume 5: Western Africa**
- Volume 6: Additional Sections – Elephants, Rhinos, Trade, Madagascar, Birds, Other Wildlife**

The first five volumes are each arranged according to six chapters (following an Executive Summary): 0. Rationale; 1. Special Features of the Region; 2. Conservation Challenges and Issues; 3. Ongoing Conservation Efforts; 4. Lessons Learnt and Promising Approaches; and 5. Indicative Conservation Actions. A somewhat different format is found in Volume 6 which begins with three chapters (Elephants, Rhinos, Trade) that relate to the wildlife crises currently affecting elephants, rhinos, numerous 'bushmeat' species including many rare forest specialist species, and various plants and trees that have market value. These three chapters contain relevant background information and strategic approaches aimed at stopping the killing, the trafficking and the demand. There is a separate chapter on Madagascar because of its unique conservation status and geographic isolation. A fifth chapter introduces priorities for bird conservation, highlighting the coordinated conservation of European-African bird migrations. An annex provides additional information on various other wildlife groups (including fish, amphibians, insects, large carnivores and great apes) that warrant special mention.

We recognise that the wildlife crisis is not confined to the terrestrial environment and that marine ecosystems are also critically impacted by unsustainable harvesting. Furthermore, we are aware that issues relating to the impoverishment of the marine environment are as far reaching as those of the terrestrial environment. A separate, but linked, strategic approach is therefore required for marine ecosystems. Similarly a separate but linked strategic approach may be required for conservation of freshwater ecosystems which recognizes unique elements of the aquatic fauna. Some freshwater ecosystems are incorporated into this strategy, particularly those wetlands that have importance for water birds, or as terrestrial ecosystems in their own

right (such as Okavango Delta, swamp forest areas in Central Africa, Rift Valley Lakes, the Sudd, Lake Chad, Senegal Delta and Inner Niger Delta), or have exceptional importance for biodiversity (Lakes Malawi and Tanganyika for example).

The European Union wishes to assist in building an inclusive strategic approach to the conservation of African wildlife that involves all political and organisational stakeholders working for the benefit of Africa, its wildlife heritage and its peoples. This document may be viewed as a first step in the process of building a consensus, after which the various strategic elements proposed will need to be translated into action through a series of programmes and projects for which detailed results and indicators will have to be developed and rigorous performance monitoring and accountability measures applied. Through cooperation we trust that the long-term future of African wildlife can be secured and that this will be done in such a way as to provide greatest benefits to the nations and peoples of Africa, and not least to the local people who live alongside and within some of the most spectacular wild ecosystems on the planet. The natural heritage of Africa greatly enriches the global natural heritage and we hope this strategic approach to its conservation will encourage others to adopt compatible strategic approaches in other regions.

1 SPECIAL FEATURES OF THE CENTRAL AFRICAN REGION

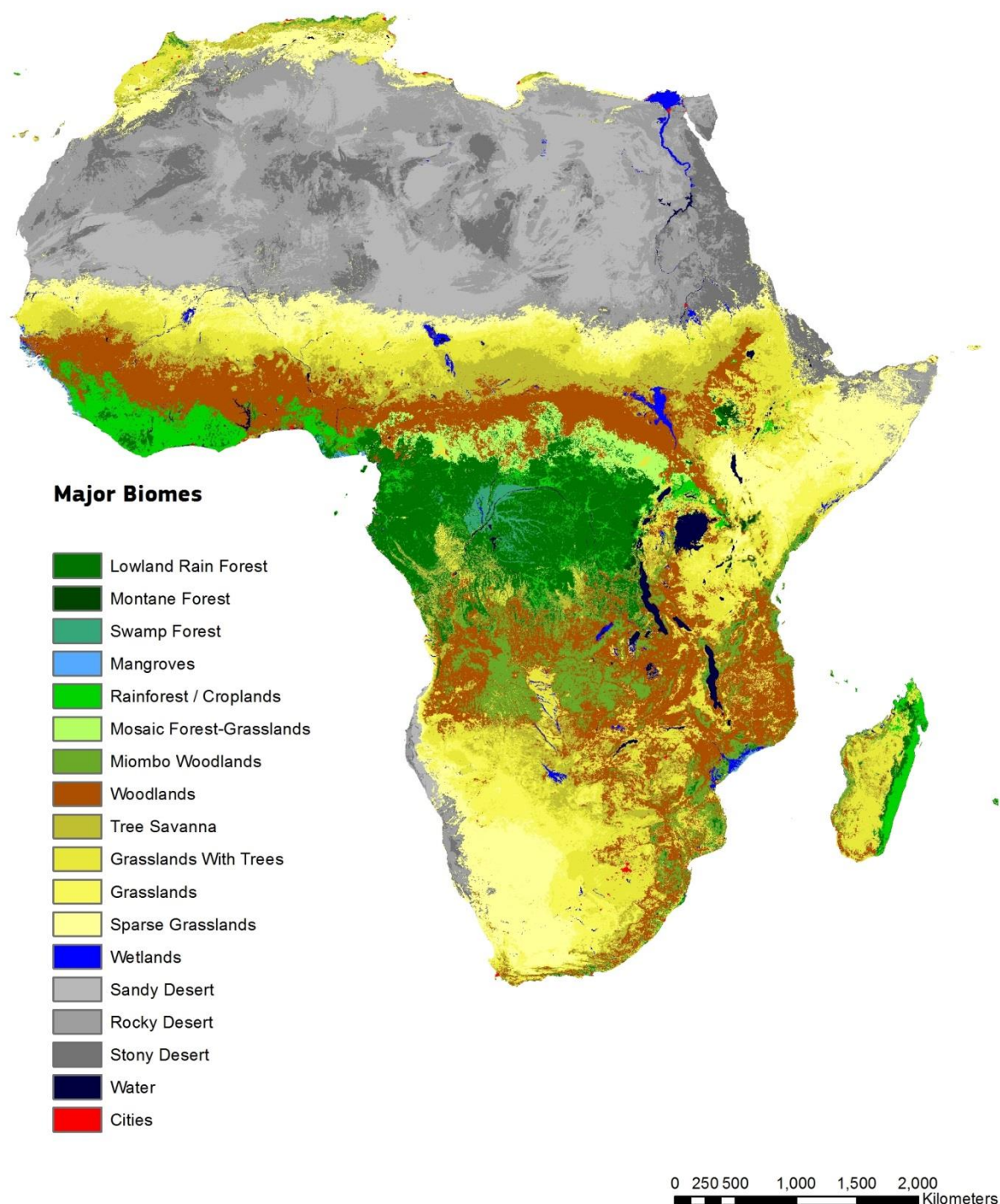


Figure 15. Major biomes of the Central African region

The Central African region as defined for the purposes of this report comprises 8 countries - Cameroon, Central African Republic, Chad, Republic of Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon and São Tomé e Príncipe.

The moist tropical forest block of what is loosely referred to as the Congo basin, is the dominant feature of the Central African region in terms of surface area, species richness and diversity, carbon sequestration and influence on climate. The gulf of Guinea islands of Equatorial Guinea and São Tomé e Príncipe also contain small, but biologically important, areas of moist tropical rainforest. To the north and south of the moist forest block the ecological transitions to woodland and savannas produce a number of biologically important ecosystems.

1.1 MOIST TROPICAL FORESTS

These forests constitute a vast block of tropical rainforests covering an estimated 1.79 million km² of Central Africa²⁰ and spanning 6 of the Central African states (Cameroon, Equatorial Guinea, Gabon, Central African Republic, Republic of Congo, and Democratic Republic of Congo) and extending also into small areas of Nigeria and Angola. The forests include a vast expanse of different types of lowland Congolian rainforests, and much more restricted, and threatened, areas of high biodiversity Afro-montane forests in the Mount Cameroon area in the west and the Albertine Rift in the east. This vast expanse of forests is often loosely referred to as the Congo basin, although it in fact covers several watersheds: Congo, Sanaga, Ntem, Ogooué, Nyanga, Niari and Kouilou, and in the east the Nile watershed. However roughly two thirds of these forests are drained by the Congo River and 60% of them fall within the DRC.

The moist tropical forests of Central Africa form an essentially uninterrupted forest block, with roughly 80% falling between 300 and 1,000m above sea level²¹. Average annual rainfall is between 1,600 and 2,000 mm, although along the coasts between Cameroon and Gabon annual rainfall is much higher (3,000 to 11,000 mm). The cycle of climate changes over the past 2 million years has had a profound influence on the forests of the Congo basin. In response to expansions and contractions of the polar ice caps, cool dry periods have alternated with warmer, humid periods, causing the forests to shrink and expand. During dryer periods, the forests were reduced to a series of scattered refuges situated along the Atlantic coastal mountain ranges, the highlands of eastern DRC, and along the gallery forests and swamps associated with the Congo River. These so called forest refuges acted as reservoirs of forest species in periods of forest contraction and as the forest fragmented and expanded, forest and non-forest species were repeatedly intermixed in a kind of “evolutionary whirlpool”²². The Okapi, the DRC’s endemic forest giraffe, is a spectacular example of a forest species clearly displaying its savanna origins.

Overall diversity, particularly floral diversity, of the Central African forests is high, though not as high as the Southern African region. However what makes these forests particularly interesting is that much of the fauna and flora is found nowhere else in the world and this is true not only at the species level but also at the genus and even family levels. The lowland forests contain around 10,000 higher plants, of which 30% are endemic (including 9 endemic families), while the afro-montane forests contain around 4,000 species, of which 70% are endemic (including 2 endemic families)²³. Several endemic and charismatic mammals occur in the Central African forests including the okapi, bongo, aquatic genet, gorilla (four subspecies) and bonobo and many of the small primates and forest duikers are also unique to these forests. In addition to the endemic Congo peacock the forests contain at least 5 bird families endemic to Africa. Amphibian, reptile and fish diversity are also high although all three groups are relatively poorly known and new species are regularly discovered. In the DRC alone over 1,000 species of freshwater fish are known. Several of the more charismatic regional endemics are confined to the DRC including the okapi, bonobo, Grauer’s gorilla, aquatic genet and Congo peacock and new mammal species are still being discovered in remote areas.

In addition to its importance in terms of species diversity and endemism the Congo basin is one of the last regions in the world where vast areas of interconnected rainforest allow biological processes to continue undisturbed. Rainforests cover only 13% of Africa’s landmass but they account for more than 90% of the carbon stored in the continent’s terrestrial ecosystems²⁴. The Congo basin is therefore a gigantic carbon sink and as such plays a vital role in regulating the planet’s greenhouse gases. Lastly it has a dominating influence on local weather patterns since over 50% of the rain that falls on the central Congo basin comes from evaporation and evapo-transpiration from the forest itself²⁵. It is important to underline that average rainfall over the Congo basin is relatively low (approximately 2,000mm) compared with Amazonia and south east Asia and places it close to the threshold of dry forests. This means that most, if not all, of the moist forest tree species would likely be lost if rainfall

²⁰ Mayaux P, Pekel J-F, Desclée B, Donnay F, Lupi A, Achard F, Clerici M, Bodart C, Brink A, Nasi R, Belward A. 2013 State and evolution of the African rainforests between 1990 and 2010. *Phil Trans R Soc B* 368: 20120300. <http://dx.doi.org/10.1098/rstb.2012.0300>

²¹ The Forests of the Congo Basin. State of the Forests 2006 (Chapter 1)

²² J. Kingdon. 1990. *Island Africa*. Academic Press.

²³ R.A. Mittermeier, C. Goetsch-Mittermeier, P. Robles Gil, J. Pilgrim, G. Fonesca, T. Brooks & W.R. Konstant. 2002. *Wilderness: Earth’s Last Wild Places*. Conservation International

²⁴ Mayaux P, Pekel J-F, Desclée B, Donnay F, Lupi A, Achard F, Clerici M, Bodart C, Brink A, Nasi R, Belward A. 2013. State and evolution of the African rainforests between 1990 and 2010. *Phil Trans R Soc B* 368: 20120300. <http://dx.doi.org/10.1098/rstb.2012.0300>.

²⁵ A. Hoare. 2007. *Clouds on the Horizon: The Congo Basin’s Forests and Climate Change*. Rainforest Foundation report. 27pp.

were to decrease slightly through climate change or extensive forest clearance. With a shift to drier forests fire would start having a devastating impact on the remaining forests, hydrological regimes would be profoundly affected, and the impact on human livelihoods in the region would be catastrophic²⁶. **The vastness and apparent intactness of the moist tropical forests of the Congo basin forests therefore belies the extreme precariousness of its existence.**

Specific features of the Central African moist forests to be highlighted include:

The Congolian Atlantic coastal forests have exceptionally high levels of species richness and endemism in all taxonomic groups, particularly birds, amphibians and reptiles. These forests contain a number of Pleistocene refuges – areas which remained forest covered during the periodic expansions and retractions of the forest block over geological times and where forest species probably survived the dry periods to colonize the new forests in succeeding wet periods. The Monts de Cristal-Monte Alén range, spanning eastern Equatorial Guinea and western Gabon, and Mont Doudou in southern Gabon, rise to altitudes in excess of 1,000m and are of particular importance for plant diversity and endemism. The Monts de Cristal has over 3,000 species of vascular plant, of which over 100 are strict endemics. Species richness of forest mammals is also exceptional. The highly restricted range of the sun tailed monkey, a species endemic to Gabon and only discovered in 1984, covers this eco-region. Globally important populations of gorillas, chimpanzee and forest elephant are also found within these forests. Other important larger mammals include the mandrill, black colobus, bongo and several forest duikers.

A vast area of inland and coastal wetlands, and pockets of Central African mangroves, is also located within this eco-region. The delta of the Ogooué River in Gabon is Africa's second largest delta after the Niger²⁷. Covering over 5,000km² of flooded forests, swamps, lagoons, lakes and mangroves, this is one of 9 Ramsar sites in Gabon and of huge importance for wildlife, particularly fish (both freshwater and marine), birds and other aquatic vertebrates such as manatee, hippo and Africa's three species of crocodile. The area contains pockets of Central African mangroves. Another unique feature of this area is the fact that elephants, gorillas, chimpanzees, hippo, forest buffalo and Nile crocodile can often be observed on the beaches on the Gabon coast. These beaches are also among the world's most important for nesting of marine turtles, particularly leatherbacks.

The central portion of these forests, particularly the part in Gabon, has one of the lowest human population densities in Africa. Nevertheless human activities in the form of industrial logging are widespread. Essentially all forests outside of protected areas have been attributed as logging concessions. Commercial hunting for the bushmeat trade is also widespread and protected species are often openly on sale in urban markets. Onshore oil exploitation in the coastal area is also a threat to biodiversity.

There are 9 IUCN category I to IV PAs in these forests (2 in Equatorial Guinea, 6 in Gabon, 1 in Congo) covering more than 27,000 km² (18% of the eco-region).

Moist forests of the Gulf of Guinea islands. The Gulf of Guinea islands comprising Bioko, Príncipe, São Tomé and Annobon form an arc of volcanic islands reaching out 750 km into the Atlantic Ocean. Uninterrupted moist forest formations from sea level to over 3,000m are found on the islands. Because of their long separation from mainland continental Africa (Príncipe emerged from the ocean some 17 million years ago²⁸) species have evolved that are unique to these islands. São Tomé and Príncipe have over 20 endemic bird species and Bioko has 2 Important Bird Areas - IBA (Luba crater and Basilé peak). Bioko also has 5 endemic subspecies of primate. The volcanic origin of these mountains gives them rich soils. The rugged landscapes of these volcanic islands are particularly spectacular. The beaches of the islands are important nesting areas for marine turtles, the remote southern shore of Bioko island being particularly important for leatherback, green and olive Ridley turtles.

There are 5 IUCN category I to IV PAs (Bioko 2, Príncipe 1, São Tomé 1 and Annobon 1) on the 4 islands covering approximately 1,260 km².

Montane forests of west Cameroon and the Albertine Rift. The montane forests and afro-alpine formations on Mount Cameroon and the Cameroon highlands in the west and the Albertine Rift in the east are areas of particularly high biodiversity and levels of endemism. For example 42 plant species, and 3 genera, are strictly endemic to Mt Cameroon (where annual rainfall attains >10,000mm locally). Exceptionally large numbers of endemic animal species occur in all taxonomic groups. For example along the Albertine Rift 30 bird and 25 mammal endemics are known. The Virunga National Park in eastern DRC encapsulates the unique biodiversity of the Albertine Rift with an uninterrupted gradient of biotopes from 700m asl to afro-alpine meadows and glaciers on the summit of the Ruwenzori range at just over 5,000m over a horizontal distance of little more than 25kms. No other area in Africa has such a wide altitudinal span of natural habitats. In an area representing only 0.3% of the total surface area of the DRC the Virunga NP is home to over half of the DRC's mammal species and two thirds of its bird species.

²⁶The Forests of the Congo Basin. State of Forests, 2008.(Chapter 10)

²⁷Vande weghe, 2007. Loango, Mayumba et le Bas Ogooué. Gabon Parks.

²⁸Gulf of Guinea Biodiversity Project http://researcharchive.calacademy.org/research/guinea_islands/

However, throughout Central Africa, montane forests have been reduced to relicts by intense human activity since these areas are coveted for agriculture and livestock. The highest human densities of the Central African region are found in these regions (>400 inhabitants/km² locally along the Albertine Rift). In the Cameroon highlands there are a large number of very small forest reserves which are not well protected. Korup NP (1,295 km²) is the only category I-IV protected area in the Cameroon highlands. Along the Albertine Rift only parts of Virunga NP and Kahuzi-Biega NP (both World Heritage Sites in Danger) protect these important forests.

Congolian swamp forests. This is one of the largest areas of swamp forest on the planet²⁹ covering some 200,375km². The Congolian swamp forests are located in the heart of the Congo basin along the middle reaches of the Congo River and along its northern tributaries (Likouala, Sangha, Likouala-aux-herbes, Oubangui) and southern tributaries (Lomami, Tschuapa, Loile). While displaying relatively low species richness and diversity they are nevertheless of high importance in terms of endemism. They are very important for fish diversity and are vital breeding areas for many species. They also play a central role in the regulation of water flows across the Congo basin. Surveys in northern Congo³⁰ in the early 90s showed that the presence of *Raphia* palms in the Likouala-aux-Herbes swamps support high populations of gorillas year round, and attract forest elephant in the dry season. The swamp forests of Lac Tumba-Lediima Reserve also support populations of bonobo³¹. Contrary to what might be expected the swamp forests are not inaccessible to poachers. In some areas of the swamps in northern Congo a dense network of dugout canoe channels in the swamps is maintained by local hunters which enable them to penetrate far into the forest and silently approach the non-inundated patches of forest where mammals tend to concentrate. Furthermore that fact that they are in dugout canoes means that they can transport larger loads of bushmeat than if they were on foot.

With the exception of a very small area along the Loile River in Salonga NP, none of these important forests lie within IUCN category I to IV PAs. However the Lac Télé–Likouala aux Herbes Community Reserve in Congo (4,525 km²) lies wholly within this forest type, as does approximately half (3,500km²) of the Lac Tumba-Lediima Reserve in DRC.

Central Congolian lowland forests cover a vast area (c. 430,000 km²) to the south of the great arc of the Congo River and are entirely restricted to the DRC. They cover almost the entire range of the bonobo³², a species of great ape that is endemic to the DRC. A network of large rivers functions as distribution barriers to many species, thereby isolating this lowland basin along its northern, eastern and western limits. Because of the relatively flat topography of the area, most of these rivers are slow flowing with heavy sediment loads, and numerous alluvial islands. Many of the soils are nutrient poor oxisols developed over ancient “dune fields”.

The central Congolian lowland forests, dominated by species from the leguminous Caesalpiniaceae family, are less floristically diverse than other areas of the Congo basin but 10% of the species are thought to be endemic. Vertebrate species richness and endemism is also lower than in other parts of the Congo basin, perhaps because the river barriers have prevented interchange of species from other ecoregions. On the other hand these barriers have meant that several mammal species, including several small primates, are endemic to the areas of forest to which they are confined by the river network. Selected examples are the recently described lesula monkey (between the Tschuapa and Lomami Rivers), the Salonga guenon (between the Lua and Lopori rivers) and Thollon’s red Colobus (between the Lomami and Congo rivers). In 2014 a probable new species of monkey, the Inoka, was discovered between the Lomami and Congo Rivers³³.

Only one category I-IV PA is located in these forests (Salonga NP, 36,000km² - a World Heritage Site in Danger) but several other protected areas (Tumba-Lediima, Lomako-Lokolala, Sankuru) are also located in this eco-region, as is the future Lomami NP.

Northwestern and Northeastern Congolian lowland forests have high levels of species richness and endemism and cover the core area of the lowland gorilla and western chimpanzee distribution. Mammalian richness is among the highest of any forest region in Africa and primate species richness is the highest in Africa. Cameroon has 29 species of primate and Gabon 19. The Okapi Wildlife Reserve (DRC) alone has 17 primate species. These forests contain the last strongholds of forest elephant, particularly in the transfrontier area of Gabon, Cameroon, Congo and CAR. A particularly important feature of these forests, particularly the northwestern forests, is the presence of hundreds of forest clearings or “bais” as they are known locally. These *bais* usually have mineral licks which attract large numbers of large mammals including forest elephant, buffalo,

²⁹Vande weghe, 2004. Forests of Central Africa. Man and Nature. ECOFAC – Lanoo.

³⁰ Blake, S., Rogers, E., Fay, J.M., Ngangoue, M., Ebeke, G. 1995. Swamp gorillas in northern Congo. *Afr. J. Ecol.* **33**: 285-290

³¹IUCN & ICCN (2012). *Bonobo* (Pan paniscus): *Conservation Strategy 2012–2022*. Gland, Switzerland: IUCN/SSC Primate Specialist Group & Institut Congolais pour la Conservation de la Nature. 65 pp.

³²The bonobo range also extends into the northern part of the southern Congolian forest savanna mosaic in the southern extremity of the future Lomami NP (IUCN & ICCN (2012). *Bonobo* (Pan paniscus): *Conservation Strategy 2012–2022*. Gland, Switzerland: IUCN/SSC Primate Specialist Group & Institut Congolais pour la Conservation de la Nature. 65 pp.

³³ Searching for Bonobos in Congo <http://www.bonoboincongo.com/maps/>

sitatunga, bongo, bush pig, giant forest hog, gorillas, chimpanzees. They often have water sources and the sedges and other aquatic vegetation provide an important food source for gorillas and ungulates.

The forest clearings are also important sites for social interactions for many of the species that visit them, particularly the forest elephant. In areas relatively undisturbed by human activities the *bais* are linked by a dense network of heavily used trails, known as elephant boulevards, which may cover many hundreds of kilometers.

These forests have, until recently, been relatively inaccessible and have therefore remained largely free of human activities. However the situation has changed very rapidly over the past 20 years. Almost all of the northwestern forests are covered by active, or soon to be active, industrial logging concessions. The dense network of logging roads has opened up the forest for immigrants in search of employment and forest resources, particularly bushmeat. Several very large industrial mining concessions (iron, cobalt, nickel) are also starting up and these will also attract thousands of people into these hitherto low populated areas. Gold deposits, some of which are of exceptionally high quality, are also found all over these forests. Most of the gold mining is artisanal and unregulated but attracts very large numbers of people. The majority of Central Africa's forest elephants are found in the northwestern forests but they are being heavily targeted by gangs of poachers with links to criminal networks operating from within, and outside, the Central African region.

There are 15 category I-IV protected areas in these forests covering a total of 74,100 km², approximately 11% of the Northeastern and Northwestern Congolian forests. The northern part of Virunga NP also covers some of this forest type. Three of Central Africa's six moist forest World Heritage sites occur within these forests (Dja Reserve, Tri National Sangha - TNS, Okapi Wildlife Reserve) although Dja and Okapi are on the World Heritage in Danger List.



Large numbers of forest elephant, forest buffalo, bongo and sitatunga share the mineral rich Dzanga bai in the CAR section of the Tri National Sangha World Heritage Site. Photo © Tom Aveling

1.2 MOIST FOREST-SAVANNA TRANSITION ZONES

These transition zones are almost as extensive as the moist tropical forests. To the north of the rainforest block the forests give way to the Northern Congolian forest savanna mosaic, a biologically interesting transition zone where plant and animals species characteristic of both the rainforests and savannas occur (chimpanzee, bongo, giant forest hog, hyena, lion, etc). With

their characteristically diverse habitat types, forest savanna mosaics support a high proportion of eco-tonal habitats, which have high species richness and have probably been important centers for differentiation and speciation. Gallery forests are the dominant forest type in this zone and this is where the typical rainforest species are mainly found. Further north the forest savanna mosaic gives way to relatively moist wooded grasslands with typically woodland/savanna species such as giant eland, northern white rhino (now extinct), black rhino (only a few individuals remain), giraffe, roan, hartebeest, lion. In Garamba NP the elephants show morphological characteristics of both the forest and savanna species.

A similar transition to forest savanna mosaic occurs all along the southern flank of the Congo basin rainforest block. The Batéké plateaus, comprising grasslands and lightly wooded savannas overlaying deep Kalahari sands, extend northwards into the south eastern part of the moist forest block (Figure 1).

Because of their relative accessibility the main threats to the forest-savanna transition zones come from subsistence agriculture, hunting and competition for grazing and water-point access by large domestic herds of livestock. Artisanal gold panning is widespread in these areas and causes locally high levels of habitat disturbance, especially in the biodiversity-rich gallery forests along water courses.

Category I-IV PAs in the northern forest savanna transition zone include Mbam and Djerem NP, Benoué NP and Faro NP (Cameroon), Garamba NP (DRC) and Zemongo WR (CAR). However the vast complex of the Bili-Uere hunting domains (category VI, 33,000km²) in northern DRC also covers this transition zone. Three category I-IV PAs occur in the transition zone to the south of the moist forest block: the southern tip of the future Lomami NP (DRC), and in the Batéké plateaus the Plateaux Batéké NP (Gabon) and Lefini WR (Congo).

1.3 EAST SUDANIAN SAVANNAS AND SAHELIAN ACACIA SAVANNAS

In the Central African region these habitat types are found in CAR, Cameroon and Chad. The climate is very hot and dry and during the dry season most of the trees lose their leaves and the grasslands dry up and burn extensively. There is low faunal endemism because the area is so vast and continuous but is quite important in terms of plant endemism. Roughly one third of the 2,700 plant species in the east Sudanian savannas are endemic. Animal species typical of the Sudanian savannas are elephant, lion, cheetah, wild dog, roan antelope and giant eland. Further north, in the drier Sahelian Acacia savannas, many mammal species have been hunted to extinction or near extinction. Species typical of this region include the scimitar-horned oryx (extinct in the wild³⁴), dama gazelle, dorcas gazelle, and red-fronted gazelle. Endangered predators such as wild dog, cheetah and lion, were all also present and common, but have now been extirpated over most of the ecoregion. The elimination of wildlife over such a large area was facilitated by modern hunting methods – rifles and four-wheel drive vehicles – and exacerbated by civil disturbance, poor law enforcement and competition for grazing and water-point access with large herds of domestic livestock.

The original wooded savanna and Acacia bushland habitats have been greatly altered over thousands of years, through long-term climatic changes and, more recently, through anthropogenic effects (herding, subsistence agriculture, fuel wood, fire). Climatic desiccation is a further threat, exacerbating the impacts of human activities, as the ability of the ecosystem to recover from overuse is reduced when there is little rainfall. In the past there were substantial populations of large mammalian herbivores, which would have grazed and browsed the vegetation. The remaining blocks of intact habitat are found mainly in the protected areas. In other areas the habitat is often degraded, but is extensive and relatively continuous in sparsely populated areas.

In the 60s and 70s the area of northern CAR was sometimes referred to as the “Serengeti of Central Africa” because of the vast numbers of large mammals that the habitat supported. However decades of poaching, and incursions by large herds of domestic livestock (in many cases owned by influential and wealthy individuals) from Sudan and Chad³⁵, have reduced wildlife numbers to very low levels. Long term conflict in southern Sudan, CAR and Chad has also prevented effective conservation in this area. Elephants have been particularly targeted in southern Sudan, northern CAR, northern Cameroon and southern Chad by Sudanese poachers and armed militia. For example the slaughter of elephants in Chad’s Zakouma NP between 2006 and 2008 resulted in a catastrophic population decline from 4,500 to 450 individuals³⁶. Similarly over a six week period in 2012 in Bouba-Ndjida NP in northern Cameroon at least half of the park’s elephants were slaughtered by a highly organized band of Sudanese poachers³⁷.

³⁴ IUCN Red Data List <http://www.iucnredlist.org>

³⁵ The flood plains of the Gounda River in the Manovo-Gounda-St Floris World Heritage Site offer particularly rich grazing for pastoralists from Sudan and Chad who now occupy the zone year round. The cattle raised here are used to supply meat markets as far afield as Nigeria.

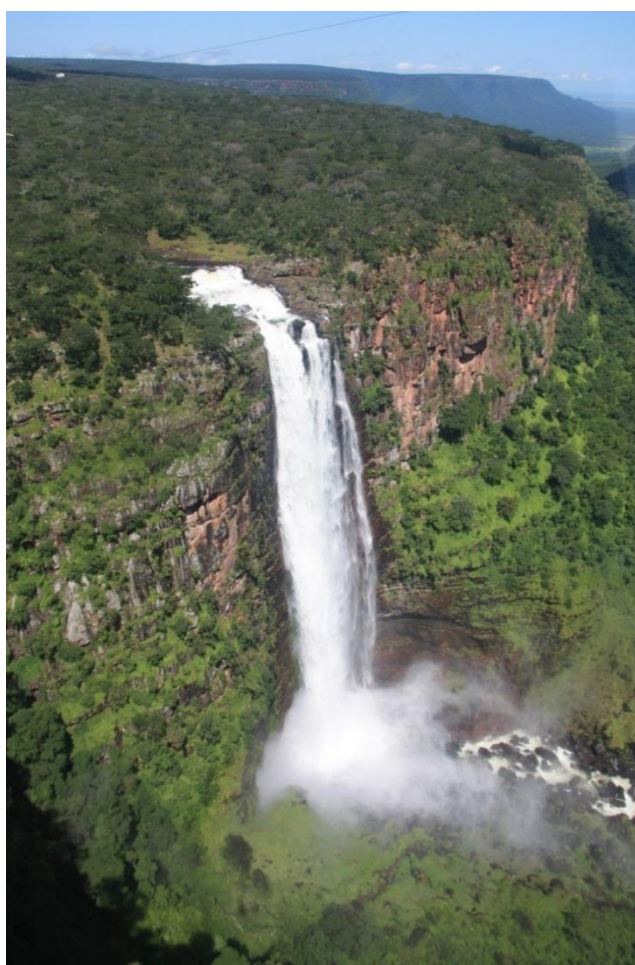
³⁶ It is important to underline that over 25 years of conservation investment in this park by the EC from the late 80s had resulted in a spectacular recovery of all wildlife in this park, and with the exception of the elephants, wildlife populations remain very healthy in Zakouma. This illustrates the fact that elephant poaching is a special issue requiring a series of highly specialized and targeted actions.

³⁷ <http://www.ifaw.org/united-states/news/elephant-population-halved-cameroon-killing-sprees-graphic-images>

Chad has several large category I-IV PAs totaling 120,000km² although the only one that is managed adequately is Zakouma NP. In CAR the complex of Wildlife Reserves, Hunting Domains and National Parks centered around the Manovo-Gounda-Saint-Floris and Bamingui-Bangoran National Parks cover 80,000km² but most are not effectively managed because of recurring conflict in the region (Manovo-Gounda-St Floris is a World Heritage Site in Danger). In fact, until the recent conflict overwhelmed to country, the areas where the best populations of wildlife remain in the savanna areas of CAR were in areas managed for sport hunting. The Chinko-Mbari watershed adjacent to the Zemongo Wildlife Reserve, covering over 80,000km², in the east of CAR still contains a surprisingly complete representation of the wildlife characteristic of this ecosystem thanks to protection provided by professional safari hunters³⁸.

1.4 SOUTHERN MIOMBO WOODLANDS

Spread throughout Central and Southern Africa, the southern miombo woodlands extend over a vast area. In the Central African region they extend across the south of the DRC from the Zambian border to Angola. These woodlands are floristically rich, dominated by slow growing leguminous tree species with a canopy height of up to 15m. Grasses cover the ground under the trees and they burn in the dry season. Miombo is thus a fire-adapted habitat. Soils are generally poor which means that



miombo woodland plants tend to be difficult to digest for mammals, thus favoring low densities of bulk feeding mega-herbivores such as elephant and black rhino (now extinct in Central Africa). Miombo woodlands are also typically rich in termite species and mushrooms, both of which provide important sources of food for local populations. Although vast in extent the Central African miombo woodlands are in fact threatened by agriculture and fuel wood cutting, particularly as they are so slow to regenerate. The high plateaus of the Katanga region of southern DRC, covered by miombo woodland and grasslands, give rise to several large rivers that feed into the Congo River. They therefore play a vital role in the provision of a regulated supply of clean water. The Katanga plateaus also provide spectacular landscapes with high tourist potential. The 380m high Kaloba falls on the Lofoi River in Kundelungu NP are the highest in Africa.

Only two national parks, Kundelungu and Upemba (DRC), totaling 21,400 km², protect the Central African miombo woodlands in Central Africa.

The 380 m high Kaloba falls on the Lofoi River in the miombo woodlands of Kundelungu NP, DRC, are the highest in Africa. Photo M. Bostroem.

³⁸<http://www.chinkoproject.com/>

2 CONSERVATION ISSUES AND CHALLENGES

In this section the direct threats to biodiversity, and the key drivers of these threats, are presented.

2.1 DIRECT THREATS

2.1.1 Unsustainable commerce of wild animal protein³⁹

The massive scale of the commercial bushmeat trade across Central Africa is leading to impoverishment of vast areas of rain forest, and local extinctions of many species, particularly the medium and large bodied species (the “empty forest syndrome”). Estimates of the scale of the Central African bushmeat trade indicate that up to 4.5 million tons of bushmeat are extracted annually from the Central African forests with an estimated value of up to 205 million \$US annually. A very wide variety of taxa are hunted (mammals, birds, reptiles). Mammals make up the bulk of the catches in terms of number and biomass, with ungulates and rodents representing two thirds of the carcasses sold in urban markets. Large bodied species are hunted where they are present (ie in recently exploited forest) but these soon disappear after which catches are dominated by smaller species such as brush tailed porcupines, pouched rat, and blue duiker. Monkeys are hunted in large numbers in many areas but as shotguns are required to kill them, the cost of the cartridges often outweighs the financial return for the hunter. However cartridges and firearms are often supplied by corrupt officials and where this happens the financial returns make monkey hunting worthwhile. For terrestrial species the overwhelming method of hunting is with steel wire snares, a commodity that is widely and cheaply available in the form of brake cables for bicycles. This method is extremely wasteful since it is unselective in what it catches and also many carcasses decay before hunters return to check their traps. Typically hunters will lay up to several hundred traps on a hunting trip. Hunters do not distinguish between protected and non-protected species – they will take whatever they find in their traps. In heavily hunted areas protected species, which are often larger bodied ones, disappear first. Larger-bodied longer-lived species with low intrinsic rates of population increase such as elephants, apes, other large primates, carnivores and large antelopes are less resistant to intensive hunting than species with high intrinsic rates of population increase such as rodents and small to medium sized ungulates. Primates and carnivores are extremely vulnerable. However some species, such as the blue duiker, are particularly resistant to hunting pressure and can maintain their population levels even under quite high hunting intensity levels.

There is increasing evidence of overfishing in many of the inland waters of Central Africa. This is particularly evident in Lake Edouard (Virunga NP)⁴⁰ where “open access” to the resource, and the involvement of powerful middle men in the trade, is depriving local fishing communities of their livelihoods. Forest people in Central Africa often naturally alternate between bushmeat and fish as a function of seasons and availability, but as bushmeat supplies diminish there will be a tendency to increase consumption of fish, leading to overfishing. Evidence of this is already occurring in the town of Mambasa in DRC (in the moist forest region near the Okapi Wildlife Reserve) where increasing quantities of fish from the Great Lakes region to the east, (including Lake Edouard) are being consumed.

³⁹Principal source of information concerning bushmeat for this section: R. Nasi, A. Taber and N. Van Vliet. 2011. Empty forest, empty stomachs ? Bushmeat and livelihoods in Congo and the Amazon basin. *International Forestry Review*, vol 13.

⁴⁰ Aveling, C. Debonnet, G. and Ouédraogo, P. 2014. Rapport de Mission. Mission de suivi réactif de l'Etat de Conservation du parc national des Virunga, République démocratique du Congo (RDC) de 07 au 14 mars 2014. UNESCO, IUCN, RAMSAR.

The loss of wildlife from forest ecosystems disrupts ecological processes and reduces biodiversity. Plant diversity and regeneration is often dependent on the presence of specific animal species or groups of species for pollination and seed dispersal. The disappearance of “keystone species” at the top of the food chain and/or important seed dispersers (elephants, apes, large carnivores, crocodiles, raptors, etc) is likely to have a disproportionate impact on the ecosystem. Central African hunting systems are biased towards heavy offtakes of seed-dispersing frugivorous mammals - over 70% of animals in an average village hunting offtake have a seed dispersal role⁴¹.

Although per capita bushmeat consumption in urban areas is lower than in rural areas, the vast majority of the bushmeat is consumed in urban areas because that is where the majority of the people in forested Central Africa lives (levels of urbanization vary from 34% in DRC to 86% in Gabon⁴²). Furthermore the contribution of urban areas to the overall bushmeat consumption is likely to continue increasing as the population of Central African countries continues to urbanize.

Bushmeat is a much needed source of protein in rural areas where there is generally very little availability of meat from domestic livestock. When wild fish is available it can outweigh the importance of bushmeat in the diet of forest dwellers, who will readily switch from one to the other according to availability. In urban areas there is greater availability of alternative meats sources but where meat alternatives are more expensive than bushmeat (eg Kisangani, Bangui) the poorer households will tend to opt for bushmeat. However in the larger cities of Equatorial Guinea, Gabon and Cameroon where there is more wealth, bushmeat is more of a luxury product rather than a protein necessity.

Although bushmeat is primarily used by rural populations for basic subsistence needs most families will also hunt to supplement their incomes. Bushmeat is often seen as a buffer to see families through hard times (crop failure, unemployment) or to gain income for special needs (funerals, school fees, weddings) and this safety net is particularly important for the more vulnerable members of the community. However the commercial trade is undoubtedly the primary driver of the increasing levels of bushmeat off take in Central Africa.

A large amount of bushmeat trade occurs across borders in Central Africa but there is also a significant international trade outside of the region.



2.1.2 Massive and criminal, largely unregulated trade in wildlife and bushmeat

Chimpanzees and crocodiles, both protected species, on sale in a bushmeat market, Gabon. The increasingly widespread phenomenon of “open access” to natural resources is leading to impoverishment of wildlife populations through overhunting for the bushmeat trade. Like elsewhere in the other African elephant range states poaching for ivory has dramatically intensified over the past decade. Central African elephants are particularly sought after by poachers because the ivory from forest elephants is denser than that of savanna elephants and preferred by ivory carvers in Asia. The Central African forests are also prized hunting areas because it is difficult to detect and arrest poachers in the forest environment, and poor governance and lack of resources and political will result in very ineffective law enforcement.

Most of the ivory poached is smuggled out of Central Africa and finally ends up in Asia where the price is so high that well organized criminal networks are now involved in the entire chain from the African forest to the illegal and “legal” markets in China. Actors in the criminal networks are numerous and varied including corrupt law enforcement, customs and administrative officers in range states, armed militia and rebel groups and diverse African (often west African) and Asian middle men. Ivory is smuggled out of the Central African states in various directions – overland to Sudan (Khartoum), by air, land and sea to west African capitals acting as transit points (Togo, Nigeria, Guinea Bissau, Senegal) for the Far East, or overland to the east African ports of Mombasa and Dar es Salaam.

⁴¹ Abernethy KA, Coad L, Taylor G, Lee ME, Maisels F. 2013. Extent and ecological consequences of hunting in Central African rainforests in the twenty-first century. *Phil Trans R Soc B* 368: 20130494. <http://dx.doi.org/10.1098/rstb.2013.0494>

⁴² <https://www.cia.gov/library/publications/the-world-factbook/fields/2212.html>

The increasing involvement of armed militia and rebel groups in the organized poaching of elephants is a particular concern because of its implications for national security. Several such cases have been documented in Central Africa. The Lord's Resistance army is involved in elephant poaching in Garamba NP (DRC)⁴³ to fund its brutal campaign, and Sudanese militia were responsible for the slaughter of elephants in Bouba-Ndjida NP in northern Cameroon in 2013. The involvement of rogue elements of the national armed forces is widespread. Their involvement ranges from doing the poaching themselves, to supplying weapons and ammunition to poachers, to providing protection for the transport of the ivory. High tech resources are often deployed. For example the Ugandan Army is suspected of having used its helicopters to poach elephants in Garamba NP⁴⁴. Also kidnapped children who have escaped from the LRA attest to the fact that helicopters (of undetermined origin) regularly landed at their camps to collect ivory.

Elephant populations have declined dramatically all over their range in Central Africa. A paper published in April 2013⁴⁵ analyzed all available survey data for Central African forest elephants between 2002 and 2012 and concluded that there had been a 62% decline. In the savannas and woodlands to the north and south of the rainforest block intense poaching over many years has reduced elephant populations to very low levels, and has extirpated them from large areas. Large scale slaughters of elephants have been recorded in Zakouma NP, Bouba Ndjida NP and the north of the CAR. As elephant populations have declined around the edges of the rainforest block poachers have moved deeper and deeper into the forested areas. Despite having 60% of Central Africa's rainforests the DRC now has only 19 % of its remaining forest elephants. WCS estimated DRC's forest elephant population at 19,000 individuals in 2011. The last remaining stronghold for forest elephants is now the trans-border area between northeastern Gabon, south west Cameroon, northern Congo and south western CAR (the TRIDOM and TNS landscapes) an area containing 12 national parks totaling some 250,000 km².

However even this area is now under intense pressure. For example a survey conducted by ANPN, WCS and WWF⁴⁶ showed that Minkébé NP in Gabon, regarded as the park with one of the highest elephant populations in Central Africa, lost between 16,000 and 20,000 elephants between 2004 and 2012, much of this ivory going out through Cameroon.

Gabon is the only remaining Central African country where elephants occur throughout the territory and is home to an estimated 40,000 to 64,000 elephants, about half the remaining forest elephants in Africa.

In the transition zone and in the savannas and woodlands to the north of the rainforest block, remaining elephant populations are isolated to scattered pockets, mainly in and around the following protected areas: Zakouma NP (Chad), Bouba Ndjida and Waza NPs (Cameroon), Garamba NP (DRC) and Zemongo WR (CAR). In the transition zone Garamba NP (DRC) has between 1,500 and 2,000 elephants⁴⁷, Mbam et Djerem NP (Cameroon) still contains an estimated 1,000 elephants, while in the Bili-Gangu sector of the vast Bili-Uere complex in north-central DRC numbers have declined dramatically and are currently estimated at 650 individuals⁴⁸.

Many other wildlife species and products are traded in Central Africa. There is a large and poorly regulated international trade in grey parrots throughout Central Africa and the trade is clearly unsustainable⁴⁹. Illegal trading of pangolin scales, mainly for the Asian market, is widespread. There is also a local, but large scale, trade in fruit pigeons in DRC. In both cases *bais* are the preferred location for catching these species as they visit them in large numbers and can be caught quite easily with nets or natural glues smeared over lures.

2.1.3 Habitat loss

Forest degradation, deforestation and forest fragmentation are important direct threats to wildlife and biodiversity in Central Africa. Deforestation leads to total loss of biodiversity, while habitat fragmentation negatively affects gene flows and ecological processes both of which ultimately result in biodiversity impoverishment.

⁴³ K. Agger & J. Huston. 2013. Kony's Ivory : How Elephant Poaching in Congo Helps Support the Lord's Resistance Army. !Enough. www.enoughproject.org

⁴⁴ A Ugandan Army Antonov helicopter was photographed in Garamba NP in April 2012 in the vicinity of a site where 15 elephants had just been killed with a single bullet through the top of the skull, and the ivory taken. The registration number of the helicopter was recorded and the Ugandan Army has so far failed to provide an explanation as to what the helicopter was doing so far into Congolese territory.

⁴⁵ Maisels F, Strindberg S, Blake S, Wittemyer G, Hart J, et al. (2013) Devastating Decline of Forest Elephants in Central Africa. PLoS ONE 8(3): e59469. doi:10.1371/journal.pone.0059469

⁴⁶ ANPN, WCS & WWF (2013) Wildlife and poaching assessment in northeast Gabon. 23pp. Report.

⁴⁷ Bolanós, N.C. 2012. Aerial animal census 2012. Garamba National Park, DRC. April and May 2012. ICCN/ANP report.

⁴⁸ Hart, J. 2014. Summary of elephant surveys in North Central DRC 2007-2013. Lukuru Wildlife Research Foundation. Draft report submitted to AfEDB, sept 2014.

⁴⁹ <http://www.birdlife.org/datazone/sowb/casestudy/568>

Annual net deforestation rates⁵⁰ across the Congo basin are lower than in Amazonia and South East Asia but are accelerating. Net deforestation for the period 1990-2000 was 0.09% and rose to 0.17% for the period 2000-2005⁵¹. Net annual deforestation was highest in DRC with 0.11% for 1990-2000 and 0.22%⁵² for 2000-2005. Congo had the next highest net deforestation rate (0.07% for 2000-2005) while Gabon's net rate for this period was zero. An assessment of forest degradation between 2000 and 2010 in the DRC published in 2013⁵³ reports a loss of 1.02% of primary forest cover due to clearing and predicts that degradation of intact forests could increase up to two-fold over the next decade.

⁵⁰ Net deforestation is the difference between gross deforestation and gross reforestation. Under the current climatic conditions natural reforestation occurs in Central Africa when habitat is left undisturbed by humans.

⁵¹ The Forests of the Congo Basin. State of the Forests 2010. Chapter 1.

⁵² Gross annual deforestation in DRC from 2000-2005 was 0.32%.

⁵³ Zhuravleva, I., Turubanova, S., Potapov, P., Hansen, M., Tyukavina, A., Minnemeyer, S., Laporte, N., Goetz, S., Verbelen, F., and Thies, C. (2013). Satellite-based primary forest degradation assessment in the Democratic Republic of the Congo, 2000–2010. *Environmental Research Letters*, 8, 024034.

The key agents of habitat loss and impoverishment in Central Africa are shifting (slash and burn) agriculture, fuelwood collection and charcoal. Fragmentation is also caused by industrial logging and mining with their associated road and rail infrastructures, agro-industrial plantations (with oil palm plantations becoming an increasingly important threat) and hydro-electric dams. Competition for grazing and access to water points by domestic livestock herds also causes habitat impoverishment in the moist forest-savanna transition zones and is often associated with the killing of wildlife, particularly large carnivores.

Shifting agriculture

This type of agriculture has been part of the ecosystem for centuries but it becomes a problem when fallow periods are shortened as the human population grows and more land is required for production. Shorter fallow periods lead to a decline in tree regeneration, soil fertility and agricultural yield. In Central Africa shifting agriculture is most intense along main roads, near villages and on the outskirts of urban centers. The problem is exacerbated by the rapid expansion of the road network, particularly by industrial logging (see below).

Fuelwood and charcoal

Fuelwood and charcoal represent 90% of all wood removal from the forests of Africa⁵⁴. Fuelwood is the main energy source for over 80% of people in Central Africa, and its consumption is expected to continue to grow in the coming decades⁵⁵ (indeed Africa is the only continent where fuelwood consumption will continue to rise). In the DRC 94% of total round wood production is for fuelwood, compared with 24% for Gabon. Peri-urban forests play a key role in providing fuelwood and charcoal, so deforestation and biodiversity loss are highest in these areas. In Kinshasa, a city of over 7 million inhabitants, the halo of deforestation from charcoal extraction extends for up to 200km from the city, but a significant proportion of its charcoal comes from even further afield - by river over distances of up to 1,000km.

Industrial logging

Most of Central Africa's rainforests are being, or will be, selectively logged. Logging is generally selective for high value species with average extraction rates at between 2 and 6 trees per hectare. In addition to the direct forest loss caused by the extraction of trees (secondary damage from felling and extraction) forest is lost for the construction of roads, sawmills and logging camps. Soil erosion, water pollution and reduction of the regeneration capacity also occur. Logging also removes nutrients and escalates forest fragmentation. The extensive network of roads created by logging activities also allows people to move into the forest to settle, and opens up vast new areas for hunters.

Industrial mining and oil extraction

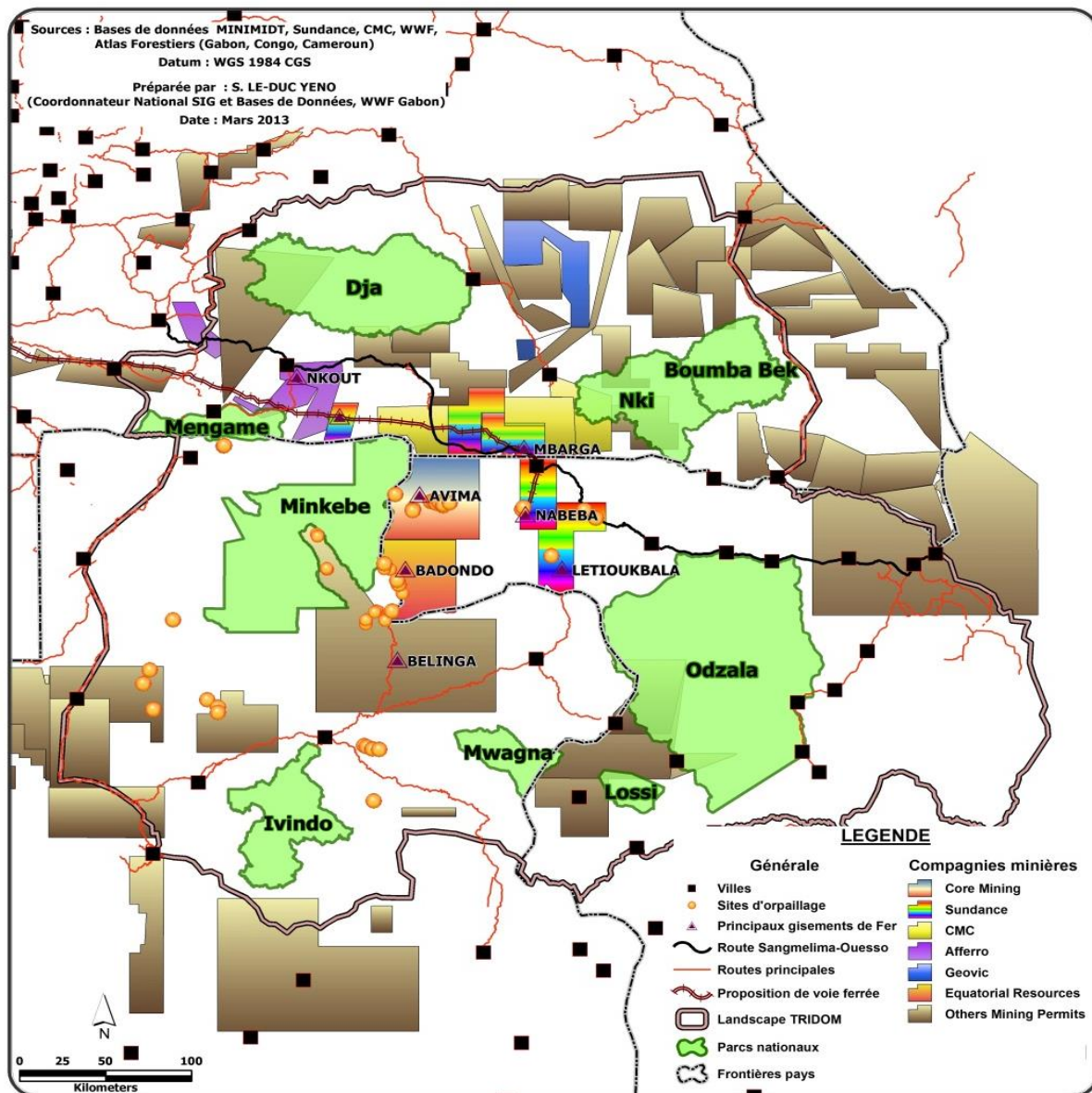
Africa contains one third of global mineral resources. The subsurface strata of the Congo basin contain very important oil and mineral resources. Several of the world's largest iron ore deposits are found in the TRIDOM landscape (Cameroon-Gabon-Congo transfrontier zone) (Figure 2). Other minerals present in the landscape include cobalt, nickel, copper, manganese, platinum, silver, uranium, zinc, lead, gold and diamonds. Key iron-ore deposits that are being, or will soon be, exploited are Belinga (Gabon), Mbalam, Nkout (Cameroon), Nabeba, Letioubala, Avima, Badondo (Congo). The Belinga and Mbalam deposits are estimated at 1 billion tons each. They are among the largest in the world, and the ore has exceptionally high iron content. To exploit the Mbalam deposit a 500 km railway line to Kribi on the Cameroon coast is planned. The capital cost of the Mbalam project over 25 years is currently estimated at 4.7 billion \$US. To exploit Belinga an extension to the trans-gabonese railway is planned and the construction of a hydroelectric dam on the Ivindo river has also been considered. This would severely impact the Ivindo NP, a potential World Heritage Site, with its spectacular series of rapids and waterfalls at Koungou.

⁵⁴ The Forests of the Congo Basin. State of Forests. 2010. Chapter 4.

⁵⁵ The Forests of the Congo Basin. State of Forests, 2010. Page 39.

Figure 16. Mining permits in the TRIDOM landscape (source WWF)

Onshore oil has been exploited for decades along the coastal area of Gabon and Congo and onshore oil exploration permits are beginning to appear all over the Congo basin. As with mining permits many of these oil “blocks” overlap partially or wholly



with protected areas. The most worrying example is Virunga NP, a World Heritage Site and the oldest park in Africa, where an oil exploration permit has been granted inside the park in contravention of the World Heritage Convention to which the DRC is a signatory.

As with logging, industrial mining causes habitat loss through the mining activity itself, the construction of associated infrastructures (camps, roads, railways, hydro-electric dams). Pollution is also a major concern. Mining also attracts massive numbers of people into the forest in search of economic opportunities. This leads to permanent settlements, agriculture and commercial hunting. The very rich gold deposits also attract thousands of artisanal miners and associated hunters and traders. In 2011 the Gabonese army evacuated a mining camp of over 6,000 people from Minkébé NP.

Agro-industrial plantations

Oil palm originates from Central Africa. Because of the huge profits that can be made, there is currently a strong push, mainly from south east Asian companies, to greatly expand oil palm plantations, particularly in Cameroon, Gabon, Congo, CAR and

DRC. A Rainforest Foundation study⁵⁶ reveals that new industrial oil palm expansion projects currently underway in the Congo Basin cover 0.5 million ha, and that at least 1.6 million ha are planned, with companies seeking even larger areas. The terms of the agreements between palm oil companies and Congo Basin governments have mostly been conducted and concluded in complete secrecy.

Oil palm plantations have a devastating effect on biodiversity as they result in total forest loss. They also cause fragmentation of forests and, if badly planned, can block gene flows and disrupt ecological processes.

2.1.4 Emerging diseases

Over the past 2 decades research has highlighted the importance of emerging diseases as a serious threat not only to human populations but also to wildlife. Since the mid-90s there have been several outbreaks of Ebola in Gabon⁵⁷ and Congo⁵⁸ in human populations and all were traced back to hunters handling ape carcasses found in the forest⁵⁹. The Ebola outbreaks in and around Odzala NP in Congo between 2000 and 2004, resulted in the probable loss of 80% of the gorilla population.

It is now known that HIV originated in chimpanzees and sooty mangabeys and made the jump to humans, and more than 40 different non-human primate species have been tested positive for Simian Immunodeficiency Virus (SIV)⁶⁰. As the meat of many of those species is being consumed by humans, the risk of many new SIV strains jumping over to humans is believed to be significant. Observations made in Cameroon of people with HIV symptoms but without HIV or SIV positive test results are causing concerns over the ongoing creation of new HIV strains, which ultimately could make it even more difficult to find a cure against AIDS.

Other diseases that have been identified in primate bushmeat species include Marburg virus, Monkey pox, Simian foamy virus, Arbo viruses (dengue and yellow fever), Anthrax, Salmonellosis, Herpes B, Cutaneous leishmaniasis and loaloa. Given the scale of the bushmeat trade the presence of these pathogens constitute a very serious human health hazard.

Wild primate populations are also at risk from human diseases such as influenza and measles. This is particularly relevant in the case of ape-based tourism where humans come into close contact with habituated groups of gorillas and chimpanzees⁶¹. These apes are particularly vulnerable to certain human diseases and this is therefore a major concern in the case of endangered species such as the mountain gorilla where only a few hundred individuals remain in two discrete populations (Bwindi forest and Virunga mountains).

As deforestation continues, wildlife will be increasingly confined to patches of forest surrounded by human settlements. This enhances the chances of contact between virus-bearing animals and humans and thus increases the chances of new diseases emerging.

2.2 KEY DRIVERS OF THREATS

2.2.1 Human population growth and poverty

Human population growth, allied with continuing poverty, is the overridingly important driver of biodiversity loss. Some nations of the Congo basin rank among the lowest in the world on most human welfare indicators, and among the highest in population growth and fertility⁶². Average annual population growth in Central Africa is between 2 and 3%. The population of the DRC is predicted to increase from 67 million in 2013 to 155 million in 2050 (Volume 1, section 1.4, Table1).

Poverty, particularly in the rural areas, means that local populations remain heavily reliant on natural resources from the forest for their subsistence. However lack of economic opportunities in rural areas leads to communities engaging in commercial exploitation of forest resources for the burgeoning urban markets where roughly half of Central Africa's population lives. For

⁵⁶Seeds of Destruction. Expansion of industrial oil palm in the Congo Basin: potential impacts on forests and people. Rainforest Foundation. February 2013. 38p.

⁵⁷Huijbregts B, DeWachter P, Obiang L.S.N., Akou, M.E. (2003) Ebola and the decline of gorilla *Gorilla gorilla* and chimpanzee *Pan troglodytes* in populations in Minkébé Forest, north-eastern Gabon. *Oryx* 37:437–443.

⁵⁸Bermejo M., Rodriguez-Tejedor J.D., Illera G., Barroso A., Vila C., Walsh P.D. (2006). Ebola outbreak killed 5000 gorillas. *Science* 314:1564

⁵⁹Rouquet, P., Froment, J. M., Bermejo, M., Kilbourn, A., Karesh, W., Reed, P., et al. (2005) Wild animal mortality monitoring and human Ebola outbreaks, Gabon and Republic of Congo, 2001-2003. *Emerging Infectious Diseases*, 11, 283-290.

⁶⁰Locatelli, S. & Peeters, M. (2012) Non-Human Primates, Retroviruses, and Zoonotic Infection Risks in the Human Population. *Nature Education Knowledge* 3(10):62

⁶¹Elizabeth J. Macfie and Elizabeth A. Williamson (2010). Best Practice Guidelines for Great Ape Tourism. Gland. Switzerland. IUCN/SSC Primate Specialist Group (PSG). 78pp.

⁶²http://www.panda.org/what_we_do/where_we_work/congo_basin_forests/problems/population_growth/

most forest wildlife species, particularly the medium to large bodied species, commercial exploitation almost always leads to overexploitation of the resource⁶³.

In the absence of any kind of effective family planning programs population growth, particularly in agriculturally rich areas such as the Albertine Rift highlands, has led to overpopulation in the highlands and a tendency for people to migrate to the lower altitude forests to the west. Not only are these forests not able to support such high population densities (resulting in larger areas of forest being cleared for agriculture) but also migration leads to conflict for land with the local indigenous communities. Overlapping customary and modern land tenure systems make these conflicts particularly difficult to resolve and this has often led to violence (eg eastern DRC) as indigenous and migrant populations clash over land tenure and power structures.

Commercial hunting of wildlife for the urban bushmeat markets is a classic example of “open access” to resources leading to overexploitation. Immigrant hunters moving in to an area recently made accessible by new roads are often resented by indigenous communities who see these “outsiders” earning revenue from “their” resources. However levels of poverty in these forest communities are such that the indigenous populations will often collaborate with the immigrant hunters in order to obtain a share of the economic profits. For example the semi nomad indigenous people (pygmies) will willingly work for commercial hunters (for very little financial return) and as they are such proficient hunters they can rapidly deplete an area of its wildlife.

2.2.2 Poor governance

For the purposes of this section the term poor governance is used to cover not only corruption, but more broadly the problems of lack of political will and the multitude of ways in which poorly designed and implemented government policies, laws and programs (covering all sectors: environment, education, justice, land tenure, health, infrastructures, mining, etc) lead to irreversible negative impacts on biodiversity.

The extractive industries (logging, mining and oil) are a major source of investment and revenue in Central Africa but the countries have generally not succeeded in translating revenues to sustainable economic development. In some cases large extractive industry revenues even appear to have retarded economic and social development through a number of phenomena known as the “resource curse”⁶⁴ (theft of revenue from resources by the ruling elite, conflict over access to resources). Despite being one of the richest countries on the planet in terms of natural resources the DRC is lowest ranked in the world in terms of per capita GDP (415 \$US)⁶⁵. Equatorial Guinea is an example where huge oil and gas revenues have placed it 30th in the world nations in terms of GDP of (29,742 \$US), but 144th in the UNDP’s ranking of Human Development Index trends⁶⁶.

The countries of Central Africa are ranked among the world’s worst in terms of corruption⁶⁷. It permeates all aspects of life, and undermines all development efforts. In Central Africa poor governance is the overarching driver compromising the sustainability of all conservation efforts. It impacts wildlife and biodiversity in many ways:

- Lack of political will to provide the necessary support for PAs. While the political discourse from Central African governments is firmly in favor of biodiversity conservation and PA management in reality most of the governments invest less than the bare minimum in their PAs. Almost without exception the only PAs in Central Africa that are being managed more of less adequately are those that are receiving support from foreign donors and conservation NGOs.
- Dysfunctional legal systems mean that law breakers are rarely prosecuted. Impunity from prosecution, particularly at the highest levels of government where corruption on a grand scale is openly tolerated, sets the standards for everyone else and breeds contempt for legal processes and a feeling that “anything goes”. In the case of wildlife crime successful prosecutions are rare and penalties are anyway not dissuasive enough. There are also wide disparities between the wildlife laws of the different countries in terms of severity of penalties for wildlife crimes.
- Poor land use planning regularly results in competing and incompatible land use attributions. Inter-ministerial communication and collaboration is notoriously weak, resulting in development choices that often do not integrate

⁶³Nasi, R., Brown, D., Wilkie, D., Bennett, E., Tutin, C., van Tol, G., and Christophersen, T. (2008). Conservation and use of wildlife-based resources: the bushmeat crisis. Secretariat of the Convention on Biological Diversity, Montreal, and Center for International Forestry Research (CIFOR), Bogor. Technical Series no. 33, 50 pages.

⁶⁴Governance of extractive industries in Africa. Survey of donor-funded assistance. Report for Norad/World Bank/African Development Bank/African Development Fund. 2008. 46p.

⁶⁵<http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD/countries?display=default>

⁶⁶ <http://hdr.undp.org/en/content/table-2-human-development-index-trends-1980-2013>

⁶⁷<http://www.transparency.org/cpi2013/results#myAnchor1> Out of the world’s 175 nations Transparency International’s 2013 Corruption Perception Index places Sao Tomé highest placed at 72, followed by Gabon (106), Cameroon and CAR (144), the two Congos (154) and Equatorial Guinea (163).

biodiversity conservation needs. Environmental Impact Assessments are generally of very poor quality and are often viewed as an administrative hurdle to enable companies to continue “business as usual”. Examples are road infrastructures, hydroelectric dams, agro industrial plantations, mining permits, etc., in areas of high biodiversity value, including inside PAs. The attribution of an oil exploration permit inside the Virunga NP World Heritage Site is one of the most high profile examples. This example also highlights another aspect to the problem which is that even when it is known that a mining or oil permit overlaps a PA countries are often unwilling to forgo the potentially huge revenues that would be generated and are prepared to override, or change, existing laws in order to allow exploitation to go ahead.

- Insecurity of land tenure leads to unsustainable use of resources. In some countries customary and State systems of land tenure overlap and this can create conflicts in land use. When forest-living people feel that they do not have a real stake in the “ownership” of their forest resources there is little incentive to exploit them sustainably. This often results in a situation of “open access” to resources resulting in overexploitation for commercial purpose.
- Dysfunctional education systems mean that a large proportion of children, particularly in rural areas, do not attend school. The quality of higher education structures is highly variable across the region. The environment is generally very poorly covered in school curricula and concepts of conservation and sustainable use of natural resources are poorly understood by the young generation.
- Dysfunctional national armies where discipline is poor and soldiers are often badly paid (or in the case of DRC often not paid at all). Members of the armed forces at all levels are frequently involved in poaching and other illegal activities such as mining. In eastern DRC members of the armed forces even collaborate with rebel groups to exploit and commercialize the same resource (eg gold, diamonds, coltan, charcoal). The presence of a band of highly armed and well organized Sudanese poachers, apparently operating with complete impunity in CAR and northern Cameroon, went unchallenged by the national defense forces until international public opinion forced them to act (by which time it was too late).

2.2.3 National and regional conflict

Central Africa has been blighted by conflict (internal and external) over the past three decades. This has had a devastating impact on livelihoods, socio-economic development and natural resource protection. Many of these conflicts can in fact be described as natural resource conflicts (eastern DRC, northern CAR, Chad, Congo). The DRC is a particularly striking example where its immense riches have brought little more than conflict. At the time of the wars of liberation between 1997 and 2004 the armies of at least 7 neighboring countries were present on Congolese territory, the major motivation for most, if not all, of them being to exploit the country's natural resources. A legacy of armed conflict is that countries end up being flooded with automatic weapons and these often end up in the hands of hunters or their patrons. The two Congos, CAR, and Chad have been particularly affected by this problem, but the porosity of international borders in this region means that other countries are also affected. The recent evolution of the elephant poaching crisis highlights how the void created by the breakdown in law and order (either in the situation of bad governance or in periods of conflict) has allowed armed militias and terrorist groups to move in and operate with virtual impunity.

3 ONGOING CONSERVATION EFFORTS

3.1 COMIFAC, CBFP AND ECCAS – A REGIONAL FRAMEWORK FOR BIODIVERSITY CONSERVATION.

The *Commission des Forêts d'Afrique Centrale* (COMIFAC) emerged from a Heads of State Summit on sustainable forest management held in Yaoundé in 1999, and the *Congo Basin Forest Partnership* (CBFP) was launched at the World Summit on Sustainable Development in Johannesburg in 2004. Together these two structures provide the strategic framework for regional cooperation and donor collaboration in Central Africa. The CBFP (Appendix 1) coordinates programs and policies of the different partner organizations in order to improve the coherence and effectiveness of their programs for the sustainable development of the Congo Basin's forest ecosystems within the framework of the COMIFAC strategic plan (*Plan de Convergence*) which was revised in 2014. Technical support to COMIFAC is provided by a number of partner organizations, including RAPAC (the Central African Protected Area Network) and OFAC (Central African Forest Observatory).

Conservation of biological diversity (including PA management) is a key component of COMIFAC's nine point strategic plan (Box 1 below). The landscape approach is an integral part of the CBFP's support to COMIFAC. This approach aims to enhance the ecological integrity of PAs and their surroundings by addressing conservation management issues in the multiple-use zones that link them.

Key regional law enforcement and biodiversity conservation planning initiatives and agreements that have been developed recently include:

- Regional Action Plan for Strengthening National Wildlife Law Implementation for the period 2012–2017 (PAPECALF) developed by COMIFAC⁶⁸. The plan aims to (i) strengthen cooperation and collaboration between supervisory bodies and the legal authorities concerned by wildlife law enforcement at the national and regional levels, (ii) intensify investigations and law enforcement operations at key transit points, borders, trans border zones and local markets, (iii) establish effective deterrents to poaching and the illegal commercial wildlife trade, and ensure that cases are properly prosecuted and the results widely publicised, and (iv) strengthen awareness about the illegal wildlife trade.
- Extreme Urgency Anti-Poaching Action Plan (PEXULAB)⁶⁹, a short term component of PAPECALF.
- Regional Action Plan for the conservation of gorillas and chimpanzees in Central Africa⁷⁰.
- Eastern DRC great apes conservation action plan 2012-2022⁷¹.
- Bonobo Conservation Strategy 2012-2020⁷².
- Central African Elephant Conservation Strategy (2005).
- Trinational Agreement – a ground breaking agreement signed in 2000 between the governments of Congo, CAR and Cameroon for the joint protection and management of the Tri National Sangha complex of protected areas. This agreement was a precursor to the area being listed as a World Heritage Site.

The Economic Community of Central African States (ECCAS, french acronym CEEAC) has become increasingly involved in addressing the issue of wildlife crime because of the damage it does to economies and security in the region. In collaboration with regional technical partners, the CEEAC is playing an important role in developing and implementing strategic responses through its anti-poaching cellule⁷³, in particular the above mentioned PEXULAB and PAPECALF. The CEEAC is also the regional structure through which the EU channels its support to ECOFAC/RAPAC.

Box 6. Key elements of the COMIFAC Convergence Plan 2015-2025

⁶⁸ Plan d'Action sous-régional des pays de l'espace COMIFAC pour le renforcement de l'application des législations nationales sur la faune sauvage (PAPECALF) 2012-2017. www.pfbc-cbfp.org/comifac.html

⁶⁹ Plan d'extrême urgence de lutte anti-braconnage (PEXULAB). www.pfbc-cbfp.org/comifac.htm

⁷⁰ Tutin, C., et. al. 2005. Plan d'action régional pour la conservation des chimpanzés et des gorilles en Afrique Centrale. Conservation International. Washington, DC.

⁷¹ Maldonado, O., Aveling, C., Cox, D., Nixon, S., Nishuli, R., Merlo, D., Pinte, L. & Williamson, E.A. (2012). Grauer's Gorillas and Chimpanzees in Eastern Democratic Republic of Congo (Kahuzi-Biega, Maiko, Tayna and Itombwe Landscape): Conservation Action Plan 2012–2022. Gland, Switzerland: IUCN/SSC Primate Specialist Group, Ministry of Environment, Nature Conservation & Tourism, Institut Congolais pour la Conservation de la Nature & the Jane Goodall Institute.

⁷² IUCN & ICCN (2012). Bonobo (*Pan paniscus*): Conservation Strategy 2012–2022. Gland, Switzerland: IUCN/SSC Primate Specialist Group & Institut Congolais pour la Conservation de la Nature. 65 pp.

⁷³ <http://www.lab-ceeac.com/>

Priority strategic themes

- Harmonization of forestry and fiscal policies
- Management and sustainable development of forest resources
- Conservation and sustainable use of biological diversity
- Combatting climate change and desertification
- Socio-economic development and multi-actor participation

Cross-cutting strategic themes

- Sustainable funding
- Training and capacity building
- Research and Development
- Communication, awareness building and education

3.2 KEY FUNDING AGENCIES AND CONSERVATION PARTNERS

Biodiversity conservation in Central Africa is delivered predominantly through international donor agencies, conservation NGOs and other technical partners working in partnership with the national forestry, wildlife and PA authorities. NGOs work with funds provided by donor agencies but also mobilise many sources of private funding. There are very many organisations working in Central Africa and it is not possible to provide a detailed description here of their different interventions.

Over the past two decades the EU and the USA have been, and continue to be, the most important donors in terms of funds mobilised for the region. Individual European nations are also making significant contributions, particularly Germany and France. Germany's focus is mainly on protected areas while France's has been mainly on the forest sector. Spain supports conservation initiatives in DRC, Congo, Cameroon and Equatorial Guinea. Norway has recently started contributing, through its International Climate and Forest Initiative. International institutions such as the World Bank (through GEF), African Development Bank, FAO, UNESCO and UNEP also support conservation efforts in the region. The paragraphs below summarise the interventions of the largest donors in Central Africa. Table 1 (section 5.1) provides a more complete overview of where the main donors and technical partners are active.

European Union

To date the EU has committed more than 500M€ for biodiversity conservation in Africa over the past 28 years. Support to PAs by the EU is either through grants to international or local NGO who are then responsible for the implementation of activities, or through bilateral cooperation (beneficiary state/EU). Through the regional ECOFAC project, launched in 1992 (and still operational) the EU pioneered a regional approach to conservation in Central Africa which promoted regional collaboration for PA management through coordinated support to specific PAs in each country. The Central African Protected Areas Network (RAPAC) emerged from ECOFAC and is one of the structures through which the EU mobilizes its funds for conservation. Other PAs are also supported within the framework of Public Private Partnerships (Zakouma NP, Odzala NP, Nouabalé-Ndoki NP (planned), Virunga NP, Garamba NP, Akagera NP (see Section 4). Over 203m€ are currently proposed for conservation activities, focusing on PAs, in Central Africa.

The EU also funds cross-cutting projects which include Central African components such as MIKES (Minimising the Illegal Killing of Elephants and other Endangered Species), BIOPAMA (Biodiversity and Protected Areas Management in African, Caribbean and Pacific countries) and OFAC (Central African Forest Observatory) and also disburses its funds through other international agencies (eg UNESCO's Central African World Heritage Forest Initiative (CAWHFI) targeting existing or potential Central African World Heritage Sites).

Through the FLEGT process the EU also contributes indirectly to biodiversity conservation by ensuring that timber imported into Europe has been exploited in conformity with national forestry laws.

The EU supports training and capacity building through its support to the Regional Post-graduate Training School of Integrated Management of Tropical Forests and Lands (French acronym ERAIFT) and the University of Kisangani (DRC).

USA

The US government delivers its conservation aid to Central Africa through USAID and USFWS.

USAID

USAID's CARPE program (Central African Regional Program for the Environment) was launched in 1997 and, like ECOFAC, promotes a regional approach to conservation. An accent is placed on the landscape approach with significant resources mobilised in the buffer zones of protected areas in 12 landscapes across Central Africa for land use planning, community based natural resource management activities and capacity building of local structures. CARPE partners with international conservation NGOs experienced in the region for the implementation of its activities. Over the past 2 decades it has mobilised between 10 and 15m\$ / year.

From 2013 to 2018 CARPE III will be rolled out through two programmes, Central African Forest Ecosystem Conservation (CAFEC) and Strengthening Central African Environmental Management and Policy Support (SCAEMPS). For CAFEC a total of 92.3m\$ is expected to be mobilised (21.6 m\$ of which will come from Norway's International Climate and Forest Initiative (NICFI) over 5 years. Actions will be concentrated on 8 landscapes located in the two Congos. For SCAEMPS approximately 10 m\$ will be allocated over 5 years to promote national and regional policy and regulatory advances and deliver monitoring tools that inform policy and support forest and biodiversity conservation.

USFWS

USFWS delivers its aid worldwide through their Wildlife Without Borders program funded through 7 Funds enacted by the US Congress⁷⁴. The USFWS is funding projects in all the Central African states (currently over 30 initiatives funded). Funds are disbursed through cooperation agreements and grants. Grants may be made to individuals, national agencies, national and international NGOs through an annual system of calls for proposals.

Over the next five years 5.5m \$/yr has been allocated for cooperation agreements with Gabon's National Park agency (ANPN), DRC's ICCN (for Virunga and Lomami NPs), and the TNS World Heritage Site. In addition grants (from 50,000 to 250,000 \$US) will be available for a variety of other initiatives aimed at reducing the bushmeat trade, strengthening judicial processes for wildlife crime, identifying and managing new PAs, and training wildlife managers⁷⁵.

It is anticipated that around 5-6 m\$US will be made available annually (subject to Congress approval each year).

Germany

Germany has been a long term supporter of conservation in Central Africa, most notably its uninterrupted support to DRC's Kahuzi-Biega NP (World Heritage Site) since 1983 and is currently one of the largest donors for conservation in Central Africa. German support for conservation is delivered through the BMZ and implemented by GIZ (technical cooperation) and KfW (financial cooperation). Over 125m€ is currently committed or in the pipeline for KfW-implemented initiatives.

German support targets various aspects of the conservation challenges in the region. Forest policy and governance are addressed through support for several processes including COMIFAC, FLEGT, certified forest exploitation and REDD+ preparation, and DRC institution building. Recognizing the shortcomings of national conservation institutions and the need for long term support for PAs and sustainable sources of funding to avoid the negative impacts of stop-start funding cycles, Germany makes significant investments in PA management (particularly in sites where experienced NGO partners are present) and sustainable funding mechanisms. At least 15 important PAs are receiving, or are about to receive, direct support for management⁷⁶ and Germany was one of the first European countries to capitalize Trust Funds in Central Africa. It was a key player in the development and capitalization of the TNS Trust Fund (Congo, CAR, and Cameroon) and is supporting the development of the Okapi Trust Fund for DRC's PA network⁷⁷. Germany was also one of the first countries to use debt swap mechanisms to support conservation activities in Central Africa.

France

France's support to conservation and sustainable forest management is delivered through AFD (*Agence Française de Développement*) and the FFEM (French Global Environment Facility).

Over the past 20 years AFD has made a particularly strong contribution to achieving sustainable management practices in logging concessions. It has helped place 20 million ha of forest in the Congo basin under management, 5m of which are certified under international standards. AFD's biodiversity conservation strategy aims at protecting, restoring, managing and developing ecosystems and fairly sharing the benefits of their development, mainstreaming ecosystem conservation in industrial development policies and strengthening partnerships between French biodiversity players and other players where AFD operates. Achieving sustainable financing for biodiversity protection through Foundations (AFD contributes to the TNS Foundation), payments for ecosystem services and biodiversity offsets is also a key element of their strategy. AFD also finances conservation activities through debt conversion mechanisms. A 50m € debt conversion for Gabon is being used to fund conservation and sustainable management of Gabon's forest ecosystems including implementation of ANPN's anti-poaching activities. AFD's current commitments for biodiversity are around 160 m€/yr with about 75% going to Sub-Saharan Africa.

The FFEM mobilises about 200m€ annually, of which roughly 5m€ goes for biodiversity conservation in Africa. In Central Africa FFEM supports efforts to improve best practices in logging and to integrate sustainable forest management (supported by France for many years) into REDD strategies for Central African countries. Other areas of support include PA management, conservation and sustainable management of wildlife in buffer zones, sustainable village hunting, and communal forests. FFEM has also played a role in facilitating the creation of Trust Funds, including the TNS Fund.

World Bank/GEF

The World Bank supports biodiversity conservation in the DRC through its National Parks Rehabilitation Project (PREPAN) and its Forest and Nature Conservation Project for which around 75m\$ are committed. The objectives of these interventions include support to high priority PAs (Virunga NP, Maiko NP), creation and capitalisation of the Okapi Trust Fund for the DRC

⁷⁴African Elephant Conservation Fund 1989 ; Amphibians in Decline Fund 2010 ; Asian Elephant Conservation Fund 1997; Critically Endangered Animals Fund 2009; Great Apes Conservation Fund 2000; Marine Turtle Conservation Fund 2004; Rhinoceros and Tiger Conservation Fund 1994.

⁷⁵Training is supported through grants to Garoua Wildlife College and an innovative new approach pioneered with Gabon's ANPN entitled MENTOR-FOREST (Mentoring for Environmental Training in Outreach and Resource conservation) to build the capacity of multidisciplinary teams of central African conservationists to improve forest stewardship and wildlife conservation. <http://www.fws.gov/international/signature-initiatives/mentor-forest.html>

⁷⁶DRC: Okapi WR, Kahuzi-Biega NP, Kundelungu NP, Lomami NP, Salonga NP, Ngiri NR; Cameroon: Korup NP, Mt Cameroon NP, Takamanda NP, Banyang-Mbo NP, Lobeke NP, Waza NP, Benoué NP, Bouba-Ndjida NP; and the TNS transfrontier World Heritage Site (Congo, CAR, Cameroon).

⁷⁷The Okapi Trust Fund is for DRC's protected areas and is initially targeting a capital of 120m€.

PA network and institution building of the national PA authority (ICCN) and its Ministry (MECNT). In southern Cameroon the World Bank/GEF will support an initiative for the conservation and sustainable use of the Ngoila-Mintom forest block located in the strategically important zone between the Dja World Heritage site and Boumba-Bek National Park.

United Nations

UNDP/GEF funding supports the TRIDOM project, a strategically important trans-border biodiversity conservation initiative in the Minkébé-Dja-Odzala interzone of Gabon, Cameroon and Congo containing 9 protected areas and logging and mining concessions (the zone includes the Ngoila-Mintom zone mentioned above). The initiative aims to officially establish governance structures for conservation and sustainable natural resource use in this tri-national trans-border complex. Activities focus on land use planning, monitoring of biodiversity and natural resource use, law enforcement and biodiversity conservation systems in logging concessions and community based natural resource management.

UNEP – UNEP coordinates the Great Apes Survival Partnership (GRASP), a partnership of great ape range states targeting the objectives of the Global Strategy for the Survival of Great Apes.

The **UNESCO** World Heritage Centre mobilizes funds from various sources (EU, France, Italy, Belgium) in support of 8 of the 9 existing World Heritage Sites as well as for the identification of new potential World Heritage sites through its two programmes: support to DRC's WHS in Danger and the Central African World Heritage Initiative (CAWHFI). The CAWHFI initiative places a particular focus on transfrontier protected area complexes and engagement with the private sector for biodiversity conservation in inter-zones connecting the protected areas. UNESCO also launched the ERAIFT regional post graduate training school in Kinshasa in 1999 and continues to coordinate it.

The **FAO/GEF** has recently launched a 10m\$ regional initiative for the sustainable management of the wildlife and bushmeat sector in the DRC, Gabon, Congo and CAR. Through a series of pilot projects the initiative aims to overcome the barriers to effective participatory wildlife management. This will involve policy reforms to give communities legal rights to the use of wildlife on their lands, develop tools for the development of community level rules for wildlife management, and strengthen capacities of key stakeholders (community managers, supporting institutions and oversight bodies) for participatory wildlife management.

Non-governmental Organisations and Foundations

INGOs and NGOs play a central role in Central African conservation initiatives. For many of the funding agencies they are the preferred structures for delivering their support as they are experienced operators on the ground, often have long-term commitments in the areas where they work, have specialist skills and generally leverage several other sources of private funding (Foundations, private donors, etc) in addition to their own “core” funding.

An extensive list of these organisations is given in Appendix 2. Some of the biggest players (in terms either of geographical scope, numbers of projects, funds mobilised, impact or long term presence) include African Conservation Fund, African Parks Foundation, African Wildlife Foundation, Dian Fossey Gorilla Fund International, Fauna and Flora International, IUCN, Jane Goodall Institute, Lukuru Foundation, Wildlife Conservation Society, Gilman International Conservation, World Wide Fund for Nature, Zoological Society of London, Zoological Society of Milwaukee.

Important private foundations supporting biodiversity conservation activities include Arcus Foundation, Abraham Foundation, Aspinall Foundation, Berggorilla & Regenwald Direkthilfe, BirdLife International, Howard G. Buffet Foundation, International Fund for Animal Welfare, International Conservation and Education Fund, Liz Claybourne and Art Ortenberg Foundation, McArthur Foundation, Murray Foundation, Rufford Foundation.

Many universities, international research institutions or campaigning organisations are also active in Central Africa (see Appendix 2) including the Centre for International Forestry Research, Environmental Investigation Agency, French Agricultural Research Centre for International Development, Joint Research Centre, Kyoto University, Max Planck Institute for Evolutionary Anthropology, Rainforest Foundation, World Resources Institute, Royal Museum for Central Africa (Belgium).

4 LESSONS LEARNED AND PROMISING APPROACHES

4.1 THE BEST REMAINING ASSEMBLAGES OF BIODIVERSITY ARE IN PROTECTED AREAS.

Almost without exception in Central Africa the areas with the most intact assemblages of biodiversity are in protected areas (or areas under active management like sport hunting zones). Furthermore the PAs where biodiversity is being most effectively protected are those that are receiving support from donor agencies and their technical partners because most national PA agencies are so weak and under-resourced.

4.2 LONG-TERM FUNDING IS ESSENTIAL FOR SUCCESSFUL BIODIVERSITY CONSERVATION

Biodiversity conservation requires sustained long-term support. Stop-start funding cycles must be avoided because wildlife populations can be lost very quickly but take a long time to recover. The EU's sustained support to Zakouma NP is a particularly good example of what uninterrupted long term funding can do to bring an area back from the brink. In the late 80s, when the EU first intervened, very little wildlife could be seen. By the mid 90s Zakouma NP was teeming with wildlife and was attracting significant numbers of tourists, both local and international. Without Germany's 30 year support to Kahuzi-Biega NP (DRC) it is doubtful that the park would have survived the prolonged period of war and anarchy. The same applies for the long term international support for Virunga and Garamba NPs. Long term conservation investment in PAs helps create conservation "hubs" which have a better chance of surviving periods of civil war because institutions and governance are stronger.

More streamlined and coordinated financial mechanisms to support high priority PAs (where several funding agencies/organizations) are present also lowers the administrative burden associated with managing multiple donors and/or relatively short term contracts and improves the chances of positive conservation outcomes.

4.3 A LANDSCAPE APPROACH, INCLUDING TRANSFRONTIER CONSERVATION AREAS, ENHANCES BIODIVERSITY CONSERVATION

While species diversity is high in the moist forests of Central Africa densities of species are relatively low and so for this reason most of the PAs, except for the very largest and best protected, are probably not large enough to ensure the long term conservation of the full range of species and biological processes. This has led to a shift in conservation strategies in recent years with an increasing emphasis on a landscape approach to conservation, the idea being to enhance the ecological integrity of PAs and their surroundings by addressing conservation management issues in the multiple-use zones that link them. The strategy is to manage the impact of human activities in such a way that gene flows and ecosystem processes are maintained across the landscape, so that PAs are prevented from becoming isolated islands of biodiversity. Since most ecological landscapes lie astride international boundaries a regional, transfrontier, approach goes hand in glove with the landscape approach⁷⁸.

In Central Africa there are several examples where contiguous complexes of PAs straddle international boundaries as transfrontier PAs. In addition to ensuring protection over a larger area (important for wide ranging species like elephant), the conservation costs are shared between the countries, and they provide refuges (reservoirs) for wildlife in the event of a breakdown of law and order in one of the countries. A good example is the complex of PAs in the Virunga landscape shared between DRC, Uganda and Rwanda. At the beginning of the 90s the hippo population of DRC's Virunga NP was over 25,000. Ten years later it was down to 500 individuals through poaching. However there is little danger of local extinction of this species because stability in Uganda ensures that the contiguous Queen Elizabeth NP serves as a reservoir for repopulation. The principle is the same for gorillas and elephants. Inter-state collaboration for the management of transfrontier protected areas also strengthens regional integration and security. Collaboration for the management of this transfrontier complex is achieved through the Greater Virunga Transboundary Collaboration agreement (Vol. 3, section 3.4.2, Box 16).

4.4 PARTNERSHIPS WITH THE PRIVATE SECTOR OFFER PROMISING MODELS FOR ENHANCING BIODIVERSITY CONSERVATION IN CENTRAL AFRICA

Two types of partnership with the private sector have been tested in Central Africa: partnerships for the management of PAs and partnerships with extractive industries in buffer zones of PAs. Both have produced promising results.

Public-private partnerships for PA management

⁷⁸ UNESCO. 2010. World Heritage in the Congo Basin. 63p.

One of the major constraints to effective PA management through classic donor-funded technical assistance projects for PAs is that the technical partners responsible for project implementation do not have a strong enough mandate to take the required actions and make the difficult decisions (such as replacing corrupt or incompetent staff). PPP agreements give the implementing partner a stronger and clearer mandate with greater decisional independence (including powers to hire and fire) and greater administrative and financial flexibility. In effect the private partner brings a more business-like approach to park management. The involvement of the private sector partner also acts as an important lever for raising other sources of funding⁷⁹. PPP agreements are particularly pertinent in countries where national capacities for PA management are very weak, although there was initial resistance to this kind of approach⁸⁰. PPP agreements in DRC (Virunga NP, Garamba NP), Congo (Odzala-Koukoua NP), Chad (Zakouma NP) and Rwanda (Akagera NP) are delivering positive conservation results, often in extremely difficult contexts, and others are planned in the region (Salonga NP, Nouabalé-Ndoki NP, Okapi WR). Box 2 below describes the African Parks PPP model for PA management. A summary of the range of legal mechanisms through which the private sector can assist with PA management is given in Volume 1, section 4.1.6, Table 3.

⁷⁹ J-P. d'Huart. 2013 Formulation d'un programme de partenariat public privé (PPP) dans le domaine de la conservation de la nature. Report to the EC.

⁸⁰ APN Annual Report 2012 <http://www.african-parks.org/>

Box 7. African Parks – a new model for protected area management

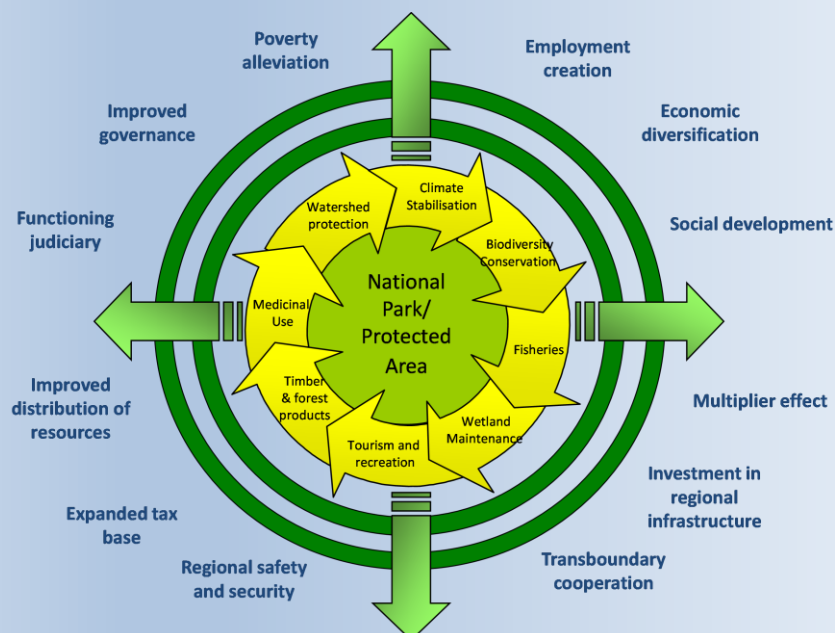
African Parks (AP) is a non-profit organisation that takes on direct responsibility for the rehabilitation and long-term management of national parks in partnership with governments and local communities. By adopting a business approach to conservation, supported by donor funding, African Parks aims to make each park sustainable in the long-term, thereby contributing to economic development of the region. Fundamental elements necessary for the success of their model are full **accountability** for their work, for which they require a secure long-term management mandate, and sound **governance** structures to ensure full transparency and avoid unwarranted interference. African Parks currently manages seven parks in six countries – Chad, Republic of Congo, DRC, Malawi, Rwanda and Zambia – with a combined area of 4.1m hectares.

The main **governing body**, African Parks Network (APN), based in Johannesburg, South Africa, is the strategic and decision-making entity which is responsible for the business plan for each park, determining capital investments, operating budgets, standard operating procedures and appointing skilled park management. Each park managed by AP is established as a **separate legal entity**, registered in the host country with its own board of directors. The board is represented by partner institutions, key stakeholders and AP representatives, and is directly accountable to government for the professional management of the park. AP aims to have majority representation at the park board level or to appoint the board chairman.

Four critical partnerships are necessary for an AP project. **Government** must support the AP approach and must be prepared to delegate management responsibilities to AP. **Community** considerations are built in to each project, often through a formal relationship with community structures represented on the park management board. **Donors** are required to support capital investment and annual operating costs until financial sustainability is achieved. **Commercial** investors are sought to develop tourism and other commercial enterprises in order to create a sustainable income base for a park.

A **secure long-term mandate** is a key to success, with a clear separation of functions between the State which retains responsibility for legislation, policy and regulatory control, and AP which is responsible for implementation. Having clear day-to-day management control of the park is crucial, as is ensuring that commercial income flows are used to contribute to the park's financial sustainability. In the short-term, donor funding is key, whilst long-term income streams are a combination of donor funding, commercial revenues from tourism and related enterprises, endowment income and payment for ecosystem services.

The long-term aim of AP is to create a conservation-led economy in each region where it operates with the park at its core (diagram below). The multiplier effects in the region in terms of socio-economic development, improved distribution of resources, better governance, and much else are what will build conservation constituencies and hopefully dispel the political indifference that undermines efforts to promote biodiversity conservation and effective protected area management.



Private sector partnerships in buffer zones of protected areas.

Logging concessions cover, or will soon cover, essentially all of the exploitable Congo basin forests. While this may seem at first view a disaster scenario, in reality a well-managed logging concession in the periphery of an **actively managed** PA offers better possibilities for conserving the forest and its wildlife than a forest with no form of management regime and no control over how the forest is used. The importance of ensuring “boots on the ground” within the PA while implementing collaborative agreements with adjacent logging concessions should be emphasized. For much of the 8 year period when Minkébé NP lost between 12,000 and 16,000 elephants (2.1.2), there were active collaborative agreements with adjacent logging concessions, but surveillance within the park was almost non-existent.

Central African forest laws are generally sound and if implemented correctly can have considerable positive impacts for conservation. Concessionaires control access to their concessions and are legally bound to integrate wildlife protection and other conservation measures in their forest management plans. FSC-certified companies are generally keen to collaborate with specialist conservation organizations (Box 3). In logging concessions in Gabon the way forward is seen as being to undertake EIEs and then to integrate the mitigation measures into the concessionaire’s legally binding Environmental and Social Management Plan.

Box 8. PROGEPP – a public private partnership for managing the buffer zone of Nouabalé-Ndoki NP

The PROGEPP initiative in northern Congo, a collaboration between the Congolese forestry authorities, a logging company (CIB) and WCS in the buffer zone of Nouabalé-Ndoki NP, was the first of its kind in central Africa and variants of this type of collaboration have since been established by WWF in Gabon and Cameroon. Using a five-pronged approach PROGEPP combined law enforcement, development of alternative activities, education and awareness-raising, and research and monitoring.

Given that the motivations of each partner for entering into this kind of partnership may be very different (logging companies want to improve their image and access to markets and financial resources, NGO’s are motivated by gains in conservation, governments pursue socio-economic development), effective collaboration requires formal protocols that clearly define the roles and responsibilities of each partner. Partnerships based on a shared vision are more enduring than those of convenience, and all partners must be actively involved in the implementation of conservation actions on the ground. Trust, respect and transparency between partners help to overcome the inevitable challenges to the partnership. Finally the combined expertise and resources of the three partners allows conservation to be conducted at much bigger scales than is possible when working only in protected areas. Conservation actions in logging concessions are most successful when communities are integrated early into the land use planning process and when the access rights of indigenous people to land and resources are recognized and guaranteed.

Successful conservation actions that were developed by PROGEPP include:

- application of strict internal company regulations concerning hunting and the transport of bushmeat;
- mobilization of a law-enforcement guard force funded by the logging company but supervised by WCS and the government;
- management of hunting zones for local communities and logging company personnel;
- importation of domestic meat by the logging company for sale in the logging camps.

Small scale husbandry initiatives had less long-term success.

Source: J. Poulsen. 2009. Building private-sector partnerships for conservation: Lessons learned from the collaboration between WCS, CIB and the Republic of Congo in forestry concessions. USAID/WCS. 56p.

Partnerships with industrial mining companies are relatively new in Central Africa but given the potentially massive impacts on biodiversity that they will have on the vast pristine TRIDOM transfrontier forest landscape, conservation practitioners are increasingly engaging with them. With the financial resources at their disposal, the political leverage that this gives them, and their need to safeguard their international image, there are clear opportunities to influence what happens to wildlife in their concessions and leverage biodiversity offset arrangements.

Since almost all forest outside of PAs is (or will soon) be attributed to private operators, conservationists have to engage with them if we are to preserve connectivity between PAs and ecological functions across large tracts of forest.

Finally, as noted throughout this document, conservation NGOs play a very important role in the implementation of conservation activities in Central Africa. However it is important that their roles and mandates should be very clearly defined from the outset so that donors do not end up funding NGOs to implement activities for which they do not have the mandate from the host government.

4.5 POLITICAL WILL AT THE HIGHEST LEVEL IS ESSENTIAL FOR EFFECTIVE BIODIVERSITY CONSERVATION.

In most of the Central African countries there is a serious disconnect between the political discourse regarding natural resource conservation, and the resources that governments mobilise to conserve them. In most countries PAs remain one of the lowest priorities in terms of national budgets. Most PA authorities are seriously underfunded and personnel are expected to work for salaries (if and when they are paid) that are well below what could be considered a decent living wage. Furthermore little consideration is given to the fact that the work is arduous and can be particularly dangerous (Virunga NP has lost over 140 park guards in the past 20 years). National budgets often make no provision for capital investment, and corruption ensures that even the meagre budgets allocated are misappropriated. Finally there are no proper career advancement structures for biodiversity conservation personnel, very little provision is made for training and retraining and the high, and often arbitrary, turnover of key staff disrupts conservation initiatives. Too often biodiversity is considered to be the “affair of westerners” and the donor community is expected to pay for it. As a result, in several important PAs that have received overseas support since the early 90s, conservation partners are still paying top-up salaries and/or bonuses to staff and covering almost all capital investment costs.

Box 9. The importance of high level political support for conservation

Gabon is setting the example of how strong political support in favour of biodiversity makes a significant difference to conservation outcomes. At the beginning of the 2000s Gabon did not have a single national park. In 2002 a network of 13 national parks, designed by a team of experienced conservation scientists and encompassing almost all of the important biomes in the country, was declared by the President and enacted in law in 2007. Where there was conflict between proposed national park boundaries and logging permits tough decisions were made and solutions found. For the creation of Lopé National Park a logging permit located inside the proposed national park boundary was cancelled and an equivalent area elsewhere was attributed to the concessionaire. A protected area agency, Agence National des Parcs Nationaux was established, and its government budget has increased significantly and steadily since it was created. The inevitable teething problems as the Agency develops the absorptive capacities to use these funds effectively are being addressed and progress is being made.

ANPN receives strong political support from the highest level for implementation of the government's flagship policies of "Green Gabon" and "Blue Gabon" which target the sustainable development of the terrestrial and marine environments. In just one year the EU fishing agreement were completely renegotiated, bogus fishing permits cancelled (involving the politically risky decision of closing down the fisheries industry for a month), no-fishing zones established and enforced and a large extension to the network of marine protected areas proposed encompassing 23% of Gabon's territorial waters. Illegally operating trawlers are being systematically seized and heavy fines imposed. Gabonese vessels are now equipped with tracking devices and followed by ANPN and the Fisheries Ministry, and fish catches are monitored and reliable statistics starting to be compiled for the first time ever.

At the regional level the President, together with his homologue from Chad, are showing strong leadership in the fight to stem the ivory poaching crisis. For example a deal was brokered at Presidential level to halt the killing of elephants in the famous Bayanga elephant bai in CAR by rebel forces loyal to the April 2013 putschists, and in 2012 Gabon publicly burned its entire 5 ton stock of seized ivory.

4.6 CREATING CONSERVATION CONSTITUENCIES IN FOREST ENVIRONMENTS HAS PROVED CHALLENGING

Creating a constituency for conservation in local communities around PAs is a key element of PA management but has proved one of the most challenging aspects for conservation projects in Central Africa. Various approaches are used: outreach programmes for agriculture, health centres, clean water sources, small hydroelectric turbines⁸¹, community-run tourism enterprises, environmental education, etc, with varying levels of success.

In forested regions so called "community conservation" initiatives have had limited success for various reasons. Local populations living in these areas often do not have secure land tenure, and therefore, control over the use of the forest resources. Local traditional land tenure is superimposed with State land tenure, but the State is generally incapable of effectively controlling how forest resources are used and by whom. This frequently leads to a situation of "open access" to resources resulting in overexploitation, especially when people with economic power (eg salaried workers in extractive industries), or better organisational capacities⁸², migrate to an area.

Forest communities are also generally very poor, often poorly educated and are characterised by an individualistic approach to the use of forest resources. Indeed the concept of "community" in forest-living peoples is misleading since the only really strong social unit is the family, and villages are simply stronger or weaker associations of families. Mobilising forest people to work together to adopt sustainable methods of natural resource use for the benefit of all is therefore complex, time consuming and costly and requires expertise from many different fields (biology, social science, agriculture, communications etc.). Furthermore community conservation models from southern Africa have little relevance in the moist forest milieu. Much effort has been spent by conservation projects trying to develop "alternative activities" to unsustainable resource use but there have been many more failures than successes. For example attempts to introduce animal husbandry or fish farming, as alternatives to bushmeat, have rarely had lasting success because (a) there is no cultural tradition for these activities and (b) hunting will

⁸¹<http://gorillacd.org/2013/08/18/virungas-first-hydroelectric-plant-online/>

⁸²The well organised and economically savvy Banande highlanders from the Albertine Rift migrating westwards to the Ituri forest in search of land have been the cause of a rapid acceleration of natural resource depletion (forest clearance for agriculture, artisanal timber extraction, gold mining) over the past two decades (ref: RFO Management Plan).

remain the preferred source of meat protein as long as there remain populations, even very depleted ones, of wild animals in the forest. Essentially people will wait until there are no longer any animals before considering other meat sources, by which time it is almost too late.

4.7 CONSERVATION PROJECTS ARE TOO OFTEN DIVERTED FROM THEIR PRINCIPAL MISSION BY BEING EXPECTED TO RESOLVE ALL THE SOCIO-ECONOMIC PROBLEMS OF LOCAL COMMUNITIES.

Following on from the above point, the “conservation-linked-to-development” paradigm that dominates modern biodiversity conservation thinking has resulted too often in conservation projects having to address all the socio-economic problems of populations living around PAs, despite rarely having either the financial resources or the expertise to do this. Furthermore it still remains to be clearly demonstrated that improving livelihoods of local communities inevitably leads to less pressure on natural resources. On the contrary, as livelihoods improve local communities will often exert even greater pressures on biodiversity⁸³ (but see following point). While improving livelihoods and alleviating poverty will always be priority components of development aid it is essential that conservation projects should be designed in such a way that they are accompanied by properly funded and resourced socio-economic development initiatives, with objectives compatible with wildlife conservation.

4.8 CONSUMPTIVE AND NON-CONSUMPTIVE TOURISM HAVE PROVIDED SOME OF THE BEST COMMUNITY CONSERVATION SUCCESS STORIES IN CENTRAL AFRICA.

Community conservation success stories are relatively rare in forested Central Africa. Consumptive and non-consumptive tourism (sport hunting and eco-tourism) have so far provided the best examples as they generate tangible spin-offs for local communities (employment, revenue sharing, a stake in the management of the resource). Mountain gorilla tourism generates millions of dollars annually and as a result is well supported both at the community and national levels. Indeed mountain gorillas are a central element of Rwanda's international marketing image. Despite being located in an area of prolonged conflict the warring parties have always understood the economic importance of gorillas and have ensured their protection⁸⁴. While not generating such spectacular revenues, lowland gorilla tourism in CAR and Congo has also proved successful particularly when it can be combined with wildlife viewing in forest clearings (bais) which provide unique opportunities for observing the large mammal fauna of the Central African forests. Constraints to lowland forest eco-tourism are the difficulties of access to these remote areas, the absence of an enabling environment for eco-tourism (serious local operators, adequate infrastructures, visas difficulties) and the challenging conditions of the lowland forest environment for tourists.

Safari sport hunting has been successful in preserving wildlife when safari operators collaborate with local communities to manage the resource and share the benefits. Surprisingly (given the history of conflict in the region) the best examples come from the savanna-woodland area of CAR. The EC funded *Zones Cynégétiques Villageoises* (village safari hunting zones) in northern CAR was very successful⁸⁵ until the zone was overwhelmed by pastoralists and armed militia from Sudan and Chad. The key factors in its success were the presence of healthy populations of flagship trophy species for hunters (notably giant eland and bongo), the active participation of local communities in the protection and exploitation of the zone through collaboration agreements with the safari hunting operators, sharing of revenues and other spin-offs (eg meat), and a low human population density enabling benefits to be felt by everyone. In 2010 an aerial survey of the PAs and surrounding hunting zones showed that all the remaining wildlife was concentrated in the hunting zones⁸⁶. A similar situation is currently being played out in Chinko⁸⁷ (eastern CAR) where a dedicated group of safari operators are successfully protecting a large area of Sudanian savanna woodlands containing surprisingly intact assemblages (though low densities) of wildlife, despite the chaos and conflict that has characterised CAR for the past two decades.

A promising model of community conservation is being tested by AWF in the Maringa-Lopori-Wamba landscape in the bonobo range. Here the conservation project intervenes to improve farmers' access to markets for their agricultural products, as a livelihood alternative to unsustainable farming practices and commercial bushmeat hunting. The intervention involved providing local communities with a boat to transport crops from the forest landscape to DRC's main markets in Kinshasa and Mbandaka, as well as new methods of sustainable farming. The barge's round-trip journey takes approximately two months. It transports up to 400 tons of product — crops travelling one way, humanitarian aid the other. The Congo Shipping Project has allowed farmers to sell produce for profit, increasing the overall income of their community. It is anticipated that farmers will have less

⁸³As forest people move into a monetary economy their increased purchasing power enables them to acquire cartridges and wire for snares. There are many examples where salaried activities in the forest environment (logging concessions, infrastructure projects, even conservation projects) has led to increased hunting pressure.

⁸⁴Rebel forces occupying the gorilla habitat have even financed their activities by organising gorilla tourism.

⁸⁵http://www.rapac.org/index.php?option=com_docman&task=cat_view&gid=85&Itemid=100206

⁸⁶P. Bouché. 2010. Inventaire aérien 2010 des grands mammifères dans le nord de la République Centrafricaine. ECOFAC.

⁸⁷<http://www.chinkoproject.com/#page-introduction>

incentive to engage in the commercial bushmeat trade and that farming practices will enable fallow periods to be lengthened, thus reducing the rate of forest degradation⁸⁸.

4.9 WILDLIFE LAW ENFORCEMENT OUTCOMES IMPROVE SIGNIFICANTLY IF THE ENTIRE JUDICIAL PROCESS FROM ARREST TO PROSECUTION IS CLOSELY MONITORED.

The EAGLE (Eco Activists for Governance and Law Enforcement) network of wildlife law enforcement NGO's⁸⁹ are achieving remarkable success with their approach of investigations, law enforcement operations, legal assistance for prosecution of cases and media coverage of the results. These organizations work closely with all the national law enforcement organizations (forest and wildlife, police, gendarmerie, customs, justice department, national representatives of INTERPOL) to detect and prosecute wildlife crime. A network of informers provides evidence, and when arrests are made lawyers are on hand to make sure that the correct legal procedures are strictly adhered to (arrest protocol, witness statements, trial, etc.) in order to ensure successful prosecution. Cases are given wide publicity in the local and international media. High level political support is important particularly when high level figures are prosecuted for wildlife crimes⁹⁰. The wide publicity contributes to improving wildlife governance, by improving understanding of the laws and serving as a warning to potential offenders.

4.10 LAW ENFORCEMENT ALONE IS NOT A LONG TERM SOLUTION TO THE BUSHMEAT CRISIS.

There are no examples in Central Africa where a comprehensive solution for tackling the bushmeat trade has been developed and tested. A review of experiences of livelihood alternatives for the unsustainable use of bushmeat commissioned by the CBD Bushmeat Liaison Group highlights the paucity of successful examples from Central Africa⁹¹. While interdiction and enforcement only policies have been widely used, they are not the complete answer in the short and medium term. However satisfactorily regulating and managing the entire supply chain, from sustainable hunting in the forest, to sale of disease-free meat in the urban markets, is also highly problematic given the problems of governance in Central Africa. Bushmeat is a food security issue as much as a biodiversity issue⁹² in rural environments and needs to be tackled from this perspective. By contrast in urban areas bushmeat is more of a "luxury" item so actions should focus on reducing the supply to urban markets by exerting pressure on the supply routes (roads, rivers, railways, airlines) and encouraging a shift in feeding habits away from bushmeat consumption.

⁸⁸<http://www.awf.org/projects/congo-shipping-project>

⁸⁹The EAGLE network comprises: LAGA (Cameroon); CJ (Gabon); PALF (Congo Brazzaville); RALF (CAR); GALF (Guinea Conakry); TALF (Togo).

⁹⁰In Gabon the Prefect (Senior Divisional Officer) of Mitzi, was successfully imprisoned for 12 months for wildlife crime and abuse of power. <http://www.conservation-justice.org/wordpress/?p=726&lang=en>

⁹¹Secretariat of the Convention on Biological Diversity (2011) Livelihood alternatives for the unsustainable use of bushmeat. Report prepared for the CBD Bushmeat Liaison Group. Technical Series No. 60, Montreal, SCBD, 46 pages.

⁹²R. Nasi, A. Taber and N. Van Vliet. 2011. Empty forest, empty stomachs ? Bushmeat and livelihoods in Congo and the Amazon basin. *International Forestry Review*, vol 13.

5 INDICATIVE CONSERVATION ACTIONS / PRIORITY CONSERVATION NEEDS

5.1 *IN SITU* LONG-TERM SUPPORT TO PROTECTED AREAS IN KEY LANDSCAPES FOR CONSERVATION

Key Landscapes for Conservation (KLC) are areas recognized to be of global wildlife importance with intact ecosystems capable of sustaining wildlife populations in the face of increasing isolation from other similar areas. The strategic approach must be first and foremost to concentrate efforts on helping the national PA agencies to secure the protection of priority PAs and their immediate buffer zones in KLCs. If wildlife cannot be protected here there is little chance that it can be preserved elsewhere given the pressures on wildlife and the speed with which wildlife populations are being impoverished across the Central African region. A pragmatic and realistic approach is required that recognises that we cannot protect wildlife everywhere. Where it is feasible efforts should be made to ensure connectivity between PAs but it should be understood that this will not be possible everywhere. As a general principle the areas where conservation efforts are likely to have the most success are those that are large and intact; in other words they have the full complement of species, in the “right” proportions, and where the population structure of the longest-lived components (the trees) has not been too badly compromised by human activities such as farming and logging. Areas where there are clear opportunities for developing effective collaboration with communities and private sector operators in the buffer zones linking the PAs (FSC certified logging concessions, mining companies) are also considered to be of particular importance. However some PAs containing exceptional species richness and/or endemism, particularly in the highly threatened Afromontane habitats, are already so isolated that efforts will inevitably be focused almost entirely on protecting the PA.

The priority KLCs are those that meet as many of the following criteria as possible:

- Recognised as a World Heritage Site for its global (scientific) importance;
- Protects a functioning ecosystem with viable wildlife populations in the face of increasing isolation caused by an expanding rural population;
- Established as a Transfrontier Conservation Area or in the process of formal development as a TFCA;
- Protects the most important populations of free-ranging elephants in the region;
- Protects a key population (as rated by the appropriate IUCN SSC Specialist Group) of one or more of the other iconic Central African wildlife species (gorillas, chimpanzees, bonobo, okapi, forest elephant, endemic small primates, endemic ungulates, etc.) which are categorised as endangered or vulnerable according to IUCN Red List Criteria;
- Protects a globally important dry-season concentration area for wildlife populations together with their wet-season dispersal zones;
- Plays an important role in protecting important wintering grounds for Palearctic bird migrants (eg wetlands recognised as Important Bird Areas – IBA);
- Protects a regionally important hotspot of endemism and diversity;
- Contains wildlife landscapes of exceptional scenic interest;
- Protects a watershed that human populations are highly dependent on;
- Plays a vital role in sustaining a key natural resource, such as a fishery or source of freshwater, that has critical national importance through public, commercial, recreational, artisanal or subsistence use.

In the moist forest zone certain KLCs span international boundaries. These Transfrontier Conservation Areas (TFCA) provide good opportunities for economies of scale, sharing of conservation costs, regional cooperation for conservation and “buffering” in time of civil unrest in one or other of the national components of the ecosystem (see also 4.3). Three such TFCAs stand out in the Central African moist forest zone: the **Greater Virunga TFCA** (DRC, Uganda, Rwanda), the **TRIDOM-TNS TFCA** (Cameroon, Gabon, Congo, CAR), and the **Gamba/Conkouati TFCA** (Gabon, Congo) (see 5.1.1. below for more detailed information). Between them they account for roughly a third of the Central Africa region’s category I-IV protected areas and almost certainly protect the majority of Central Africa’s floral and faunal diversity. They also include most of the priority areas identified in the Central African Chimpanzee and Gorilla Action Plan and the Eastern DRC Great Apes Action Plan, and cover the majority of Africa’s remaining forest elephants, of which Gabon alone probably holds 50%⁹³.

⁹³ Maisels F, Strindberg S, Blake S, Wittemyer G, Hart J, et al. (2013) Devastating Decline of Forest Elephants in Central Africa. PLoS ONE 8(3): e59469. doi:10.1371/journal.pone.0059469

In the drier ecosystems to the north of the moist forest block, spanning the forest-savanna transition zone and the east Sudanian savannas of CAR, northern DRC, southern South Sudan and southern Chad, there are a number of important sites harbouring wildlife characteristic of these zones. These include Zemongo/Chinko complex in eastern CAR, the Garamba NP/Bili-Uere complex in northern DRC and the Southern NP in South Sudan. However much of this area suffers from high levels of insecurity and conflict and is intensively used for wildlife trafficking. In these areas it is not only very difficult to work effectively within the existing PAs but opportunities for developing concrete conservation activities in the areas linking them are currently limited. However although wildlife populations have been seriously depleted over much of this area it is considered important not to abandon it since, given the very low human density and the vastness of the area, there is potential for recovery if security and law and order can be restored. WCS working in this area has had success developing what they refer to as Conservation Security Partnerships through which wildlife law enforcement is linked with efforts to address security threats to local people (Box 5).

Box 10. Conservation Security Partnerships - a concept for linking wildlife conservation efforts with efforts to address security threats to local people

WCS working in the South Sudan/CAR/north DRC transfrontier area have developed the concept of Conservation Security Partnerships (CSP) for operating in zones of high wildlife value where insecurity and lawlessness is an issue. It is based on a similar approach developed by the Northern Rangelands Trust of Northern Kenya and aims to embrace explicit conflict mitigation and security enhancement objectives together with wildlife protection and protected area management.

At the regional level the CSP involves partnerships between wildlife law enforcement forces, police, military, international security organizations (eg AFRICOM) and local community leaders which link wildlife law enforcement efforts to protect and secure wildlife with efforts to address security threats to local people (cattle raiding, local militia/rebels) as well as broader security threats to state and regional stability. For example in Southern NP in South Sudan park rangers are linked in with AFRICOM, SPLA and UPDF, as well as local community scouts, to eliminate LRA threats and contribute to elephant protection and anti-trafficking.

At the local level Community Based Conservation Security Partnerships (CBCSP) involve local communities directly in monitoring of illegal activities, intelligence gathering, first alert systems, joint patrolling with wildlife forces and inter-tribal peace processes using common security and wildlife conservation concerns as a neutral common ground.

In addition to these very large KLCs, a number of individual sites containing a single PA and its buffer zone should be targeted for support. Priority should be given to existing **World Heritage Sites** which, by virtue of their WHS status are internationally recognised as being of global importance for nature conservation, and to sites which are on the countries' Tentative Lists for WHS status or which protect specific globally important features not found elsewhere.

In countries open to PPPs for the management of their PAs this approach should be promoted (DRC, Chad, Congo). Elsewhere, where the institutional context is favourable (such as in Gabon) support to the PA agency through collaborative agreements should be considered. This could include the secondment of qualified staff (expatriate or otherwise) to the national organisations with a dual management and training role.

The support for PA management should place particular emphasis on:

Strengthening anti-poaching and general law enforcement activities.

- Equipment (and, importantly, mechanisms for proper management of the equipment) and law enforcement training, including paramilitary training, will be major components in many sites. Where feasible and appropriate specialist anti-poaching/surveillance organizations should be involved⁹⁴.
- Establishing Law Enforcement Monitoring tools (SMART, CyberTracker⁹⁵ or others, Box 6 below) and Protected Area Management Effectiveness monitoring tools as standard features of park management procedures.
- Mainstreaming the LAGA approach (investigations, operations, legal assistance, media coverage) into the PA management operations (see 4.9 above).

Box 11. Spatial Monitoring and Reporting Tool – SMART

In order to strengthen the effectiveness of monitoring and patrolling, a global consortium of NGOs and conservation agencies (WCS, WWF, ZSL, Frankfurt Zoological Society, CITES-MIKE and North Carolina Zoo) have developed the Spatial Monitoring and Reporting Tool (SMART; www.smartconservationtools.org). SMART harnesses ranger-collected data on threats and performance by applying new technologies to local needs and capacities through an easy-to-use software tool and a suite of best practices for patrol monitoring and management. At the local level, SMART can support anti-poaching by enabling identification of poaching hotspots, evaluation of ranger performance, and more efficient targeting of enforcement efforts; at the national level, the information can strengthen institutional communication channels to better allocate financial and human resources to improve anti-poaching efforts; and globally, the information provides standardized, reliable, and accountable measures of poaching and performance to prioritize funding streams and encourage better governance.

SMART is being implemented in more than 100 protected areas worldwide through technical support provided by SMART partners in collaboration with host government agencies. In Africa SMART is being used in protected areas in 14 countries, with national-level adoption of the system already secured in Gabon and underway in Uganda, Kenya, and Democratic Republic of Congo. The SMART Partnership is also engaged with several global institutions and conventions in joint efforts, such as CITES-MIKE and the World Heritage Centre. Through these and other multi-lateral and international mechanisms, SMART has the potential to become the global standard for improved law enforcement monitoring (LEM) across protected areas.

Ensuring that there are sufficient resources for regular monitoring of key conservation targets, particularly great apes (see the different great ape Conservation Action Plans) and forest elephants. In addition to data on the target species it should be remembered that these surveys generate a great deal of other essential information for managers, notably human activities. Over the past 20 years much work has been done to refine methodologies for large mammal survey methods in the moist forest environment and standard methodologies are now being used widely across the region enabling more reliable comparisons to be made. However these surveys require considerable resources and until now have not been conducted with sufficient frequency. For forest elephants for example, in addition to the official Central African MIKE sites, a number of other important sites require urgent surveys. These are Lobéké, Nki, Mbam et Djerem National Parks and Ngoula-Mintom zone

⁹⁴ <http://maisha-consulting.com/>

⁹⁵ <http://www.cybertracker.org>

(Cameroon); Conkouati and Ntokou-Pikounda National Parks (Congo), Moukalaba-Doudou, Wonga-Wongue, Loango, Birougou, Mwagne, Ivindo, Waka and Mts de Cristal National Parks (Gabon).

Aerial monitoring and surveys is a very cost effective tool for which sufficient resources should be made available. While its usefulness over the open savanna ecosystems are self-evident aerial monitoring over the moist forest ecosystem has also proved highly effective particularly for monitoring use of the ecologically important forest clearings (by humans and animals), and also for monitoring mining and logging activities (new roads and tracks, etc.). This should be an integral part of monitoring activities.

Training of field staff (wardens, assistant wardens, monitoring officers, community outreach officers). This is in addition to the specific anti-poaching training referred to above. This should include on-the-job training as well as formal training in specialised regional or international institutes (see also 5.3).

Community outreach activities to build conservation constituencies for the parks that are relevant to the particular contexts of the sites and are practical and achievable. Outreach programs developed by the park must not attempt to resolve all the socio-economic ills of the neighbouring populations. That task should be assigned to specialist organisations with appropriate budgets, and the objectives of the interventions must be compatible with the conservation objectives of the park, and preferably run in parallel with the support to the PA. Awareness building and effective communication between stakeholders will be an integral part of outreach activities. The INCEF⁹⁶ approach is considered particularly effective for awareness raising and dissemination of information in local communities. INCEF focuses on locally produced and disseminated videos as an educational tool to foster improvement of the health and well-being of human and wildlife populations. It does this by building capacities of local media professionals to produce quality films in local languages and building capacities among local education teams to disseminate the videos and measure their impacts.

5.1.1 Transfrontier conservation areas (TFCA)

Brief descriptions of important KLCs spanning international boundaries as TFCAs are given below.

Greater Virunga TFCA

This complex encompasses 11 protected areas in DRC (Virunga NP), Rwanda (Volcans NP) and Uganda (Queen Elizabeth NP, Mgahinga Gorilla NP; Bwindi NP, Semiliki NP, Ruwenzori NP, Kibale NP, Kasyoha-Kitomi FR, Kalinzu-Maramagambo FR, Kyumbura WR). Covering about 12,860 km², and with an altitudinal range of 600 to 5,100 m, this area protects the world's remaining 800 mountain gorillas as well as a significant proportion of the Albertine Rift endemics. It is considered one of the most species rich regions on earth⁹⁷ and is undoubtedly one of the most spectacular landscapes in Central Africa. It is also the only area in Central Africa where very substantial tourism revenue is guaranteed (gorillas, chimpanzees, active volcanoes, Ruwenzoris, savanna fauna). Mountain gorilla tourism generates millions of Euros annually for the national economies of the countries involved and enhances their international standing. Indeed the safeguarding of the mountain gorilla population was one of the few issues over which the three countries, variously in conflict with each other over the past 20 years, were able to agree. The Greater Virunga Transboundary Collaboration, with its Executive Secretariat based in Kigali, Rwanda is a mechanism established by the three countries for strategic, collaborative management of the Greater Virunga landscape. The gorilla population has increased steadily since the late 70s. Tourism revenue is guaranteed to increase as long as the mountain gorilla population remains protected. Gorilla tourism is also one of the few examples from Central Africa where local communities benefit clearly from the presence of the park (and mostly recognise the fact that they do – an important nuance).

⁹⁶ <http://www.incef.org/>

⁹⁷ Plumptre, A.J., Behangana, M., Davenport, T., Kahindo, C., Kityo, R., Ndomba, E., Ssegawa, R., Eilu, P., Nkuutu, G., and Owini, I. (2003). The Biodiversity of the Albertine Rift. Albertine Rift Technical Reports N°3.



Figure 17. Map of the Greater Virunga TFCA

Greater TRIDOM-TNS TFCA

This TFCA covers a very large area of essentially contiguous moist forest spanning the borders of three countries (Cameroon, Gabon and Congo). It includes two Central African landscapes known as TRIDOM (Tri national Dja-Odzala-Minkebe) and TNS (Trinational Sangha) but is also extended to include Lopé NP WHS and Lac Tele Community Reserve since the habitat linking all these PAs is almost contiguous and much of it is under concession to the logging and mining industries.

It covers 15 protected areas in Gabon (Ivindo NP, Mwagne NP, Minkebe NP, Lopé-Okanda WHS), Cameroon (Dja WR WHS, Nki NP, Boumba Bek NP, Lac Lobeke NP, Kom NP), Congo (Odzala NP, Nouabalé-Ndoki NP, Ntokou-Pikounda NP, Lac Tele CR), CAR (Dzanga-Ndoki NP, Dzanga RS). The TNS part of this KLC differs from the other PAs in this landscape in that it is a transfrontier World Heritage Site (the first in the world) composed of 4 contiguous protected areas, managed within the framework of a tri-national agreement⁹⁸ between the governments of CAR, Cameroon and Congo and funded through its own Trust Fund (see below). Lopé-Okanda is both a natural and cultural World Heritage Site

This vast area of over 250,000km² contains the majority of Central Africa's forest elephants, lowland gorillas and chimpanzees as well a wide cross-section of the Congo basin fauna. Floristically the PAs together protect a substantial proportion of the Congo basin flora⁹⁹. Almost all the forest in between the PAs is, or soon will be, under the management control of extractive industries (logging and mining). This offers many possibilities of PPP to enhance wildlife conservation in the concessions and thus preserve forest connectivity between the network of PAs (see section 5.2). Some of the PAs have extraordinary tourist

⁹⁸ A tri-national cooperation agreement between Gabon, Cameroon and Congo also exists for TRIDOM

⁹⁹ J.J. Wieringa and M.S.M. Sosef. 2011. The applicability of relative floristic resemblance to evaluate the conservation value of protected areas. *Plant Ecology and Evolution Fast Track*:1-7

potential (TNS, Odzala, Ivindo) because of the presence of many forest clearings with guaranteed viewing of forest elephant and gorillas and a wide spectrum of other forest animal species. In TNS, Odzala and Ivindo tourist infrastructures have already started attracting international tourism although it is still a long way from being a profit making operation. The private sector partner in Odzala has invested in particularly impressive high-end infrastructures¹⁰⁰ which is a clear indication of the conservation importance and tourism potential of this site.

Over the past 15 years conservation partners and logging companies have developed collaborative partnerships and tested methodologies for wildlife management, anti-poaching and sustainable hunting in the logging concessions adjacent to this complex of protected areas. Lessons learned from these partnerships should be used to guide evolving partnerships with the mining sector, a more recent arrival in the landscape with an enormous capacity to influence, both negatively and positively, what happens here. PPP management agreements exist for the management of Odzala NP and Nouabalé-Ndoki NP.

In 2007 the TNS Trust Fund (FTNS) was established with support from the World Bank/WWF Alliance for Forest Conservation and Sustainable Use, GTZ, WCS, AFD and USAID-CARPE. Currently the FTNS has a capital of approximately 25m€ provided by KfW, AFD, and Regenwald Stiftung through the "Krombacher Regenwald Kampagne". These funds are invested in international markets and are expected to produce a stable revenue stream to cover targeted activities for conservation and sustainable development.

¹⁰⁰Odzala Wilderness camps: <http://www.odzala-kokoua.com/>

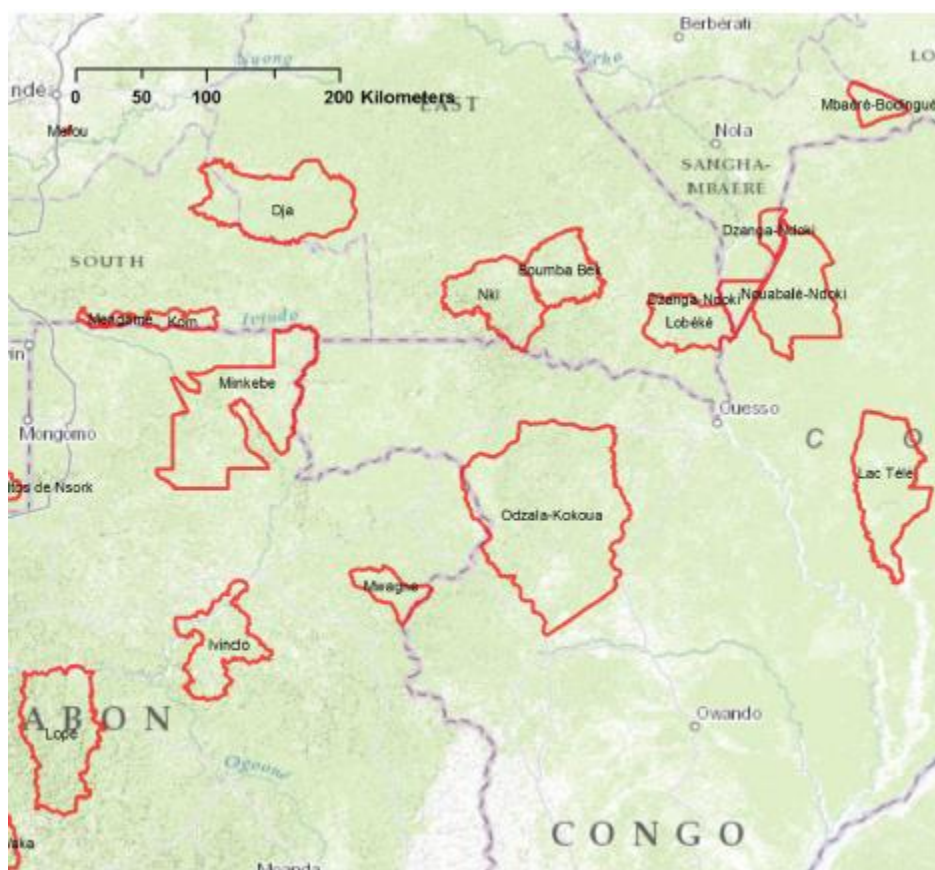


Figure 18. Map of Greater TRIDOM/TNS Transfrontier Conservation Area

Gamba/Mayumba/Conkouati TFCA

This complex includes 4 PAs in Gabon (Mayumba NP, Loango NP, Moukalaba-Doudou NP) and Congo (Conkouati NP) and is important because it encompasses some of the best examples of coastal forests and wetlands in Central Africa. The landscape is also globally important for 4 species of marine turtle that nest on the beaches, and 17 Cetaceans, including an important population of humpback whales which are easily observed during the breeding season from June to September. The extensive areas of inland lagoons harbor populations of the endangered West African Manatee, as well as terrestrial large mammal assemblages including gorillas, chimpanzees, forest elephants, forest buffalo and hippos, all of which can sometimes be observed on the beaches. The area therefore has major tourist potential, in addition to its global importance for wildlife conservation.

Over the past 15 years conservation and research partners, notably WWF and the Smithsonian Institution, have developed innovative and successful partnerships with private sector logging and oil companies¹⁰¹ active in the area to enhance biodiversity conservation and these types of partnership should be continued and developed.

¹⁰¹Smithsonian Institution collaborates with Shell: Oil <http://nationalzoo.si.edu/SCBI/Collaborative-Research-Initiatives/Gabon-Biodiversity-Program.cfm>
WWF collaborates with oil and logging companies on land use planning, wildlife management and anti-poaching, and alternative livelihoods, http://awsassets.panda.org/downloads/wwf_gamba_fact_sheet_en_300410.pdf



Figure 19. Map of the Gamba/Mayumba/Conkouati Transfrontier Conservation Area

Garamba / Bili-Uele / Southern / Zemongo-Chinko TFCA

It is recognised that this TFCA is significantly different from the others described above in that the area is characterised by extreme insecurity and lawlessness which has led to depletion of wildlife populations over the past 25 years. However it is considered important to maintain a presence in the zone to (i) secure the PAs, one of which is a WHS in Danger and (ii) contribute to conservation security in the intervening zones. Trafficking of wildlife to northern Sudan from this area, as well as from further south in the Congo basin, occurs across this vast largely uncontrolled area. There is therefore a need, and good potential, for a broad Northern DRC-Eastern CAR-Southwestern South Sudan conservation-security partnership (Box 5 above) including wildlife services of the three countries, NGOs operational in the areas (WCS, APN, Chinko Project) and AFRICOM, US Departments of State and Defense, and local military operators (SPLA, UPDF, UN armed missions). Gabon's ANPN has also recently become involved helping the CAR government with wildlife security issues, including in Chinko.

Biologically the area contains vast intact areas of biodiversity-rich forest-savanna mosaic as well as the drier Sudanian savanna and woodland wilderness areas. As recently as the early 1980s this area supported the highest density of elephants in Africa and there is potential for recovery given the low human densities and the intactness of vast areas of natural habitat. The area contains three national parks: Garamba NP in DRC, and Lantoto NP (contiguous with Garamba) and Southern NP in South Sudan. Other PAs are the vast Bili-Uere complex of Wildlife and Hunting Reserves in DRC and the Zemongo Wildlife Reserve and Chinko Hunting Reserve in the CAR. Garamba NP has the most important elephant population remaining in the region (although currently suffering intense poaching pressure from the LRA and Sudanese gangs¹⁰²). Southern NP remains a stronghold for giant eland and also contains roan, hartebeest and wild dog¹⁰³. The Chinko-Zemongo complex has a remarkably intact (though low density) array of wildlife species typical of the forest-savanna ecotone including giant eland, buffalo, bongo, lion, elephant, chimpanzees and giant forest hog. Similarly recent surveys in the long abandoned Bili-Uere complex have confirmed important pockets of wildlife particularly in the forest sections of the forest-savanna mosaic^{104, 105}.

The Monts de Cristal - Altos Nsork TFCA

This mid altitude mountain range spanning Gabon and Equatorial Guinea represents a Pleistocene refuge with the highest species richness and diversity of any site in western Central Africa, including perhaps the greatest plant diversity in Africa. With a unique combination of primary rainforest and cloud forest, it has one of the highest numbers of butterfly species in Africa

¹⁰² http://www.african-parks.org/Blog_150_Update%3A+Garamba+National+Parks+Poaching+Crisis.html

¹⁰³ Grossmann, F., Elkan, P., Tiba, C., Moi, J., Awol P. P., Lita, J., Demetry, P. and S. Kenyi. 2011. Aerial Surveys of Wildlife, Livestock, and Human Activity in and around Existing and Proposed Protected Areas of the Republic of South Sudan 2009 - 2010. WCS Report No. 4 to USAID and Government of South Sudan.

¹⁰⁴ Elkan, P., et al. (in prep.) Aerial surveys of Wildlife, Livestock, and Human activity in the Bili-Uere landscape, Democratic Republic of Congo. WCS and ICCN technical report on survey conducted in 2013.

¹⁰⁵ Hart, J. 2014. Summary of elephant surveys in North Central DRC 2007-2013. Lukuru Wildlife Research Foundation. Draft report submitted to AfEDB, sept 2014.

(many species are found only here and Equatorial Guinea). It has a significant population of elephants and mandrills, and is a key water source for the region.

The Korup-Takamanda-Mount Cameroon TFCA is covered in Volume 5 (Western Africa).

5.1.2 Other priority KLC's

While the TFCAs described in 5.1.1 above provide a reasonably comprehensive coverage of Central Africa's biodiversity and key flagship species populations, the following KLCs, some of which contain only a single PA, are also considered as highest priority for support, either because they are already on the World Heritage Tentative List (and therefore have the potential to meet the Outstanding Universal Value criteria of the World Heritage Convention) or because they protect unique or highly endangered species or ecosystems.

Democratic Republic of Congo:

- **The remaining three DRC World Heritage Sites: Okapi WR, Kahuzi-Biega NP, Salonga NP.** (Virunga NP is covered in the Greater Virunga TFCA, and Garamba NP in the Garamba-Bili Uere-Southern-Chinko TFCA). Their status as WHS confirms their global importance. Globally important DRC endemics are protected by these sites (Okapi, Grauer's gorilla, Bonobo, Congo peacock, aquatic genet, numerous small primate endemics). The Okapi Wildlife Reserve is the most important protected area for the Eastern Chimpanzee (about 6,000 individuals) and contains the DRC's largest forest elephant population (estimated at 1,200 in 2011¹⁰⁶).
- **Lomami NP** (in the process of being gazetted). This area contains several DRC endemics including the iconic bonobo and okapi. Scientists have also recently described a new endemic monkey species, the *lesula* monkey (*Cercopithecus lomamiensis*)¹⁰⁷ and a second new species is currently being described. This is a very remote area of moist forest with relatively limited human and development pressures on its boundaries.
- **Lomako-Yokokala NR** : A priority area for bonobos in the northern part of its range (IUCN Bonobo conservation Strategy) and an area where long term research has been conducted.
- **Tumba-Lediima NR**: A priority area for bonobos in the western part of its range (IUCN Bonobo Conservation Strategy). In addition the swamp forests of Lac Tumba (together with those of Lac Tele CR in the Congo Republic – see below) constitute the largest area under protection of the vast and unique Congolian Swamp forests.
- **Itombwe-Kabobo**: The Itombwe Massif and the adjacent Kabobo-Luama landscape on the Albertine Rift are both in the process of becoming protected areas: the **Itombwe Natural Reserve** and the **Ngamikka National Park** respectively. These contain the highest number of Albertine Rift endemics of any site on the Albertine Rift with many species that are unique to the two sites. Recent discoveries include 3 mammal and 5 plant species, and a possible 10 new amphibian species. Kabobo-Luama landscape may have as many as 2,000 chimpanzees while the Itombwe Massif has both chimpanzees and Grauer's gorilla populations.
- **Maiko NP**. Given the highly heterogeneous distribution of the Grauer's gorilla (making it vulnerable to local extinctions outside of PAs) this park is important for the protection of this DRC endemic. Several other Congo endemics occur there (Congo peacock, okapi, aquatic genet). This park is currently very difficult to operate in because of problems of access and the presence of Simba rebels who have been living in the park since the late 60s.
- The two Katanga national parks **Kundelungu NP and Upemba NP** and the **Zone Annexe** connecting them. These are the only national parks in the Central African region that protect the miombo woodland ecosystem. The endemic Congo Zebra survives in Upemba NP and there is strong potential for recovery of wildlife populations given proper protection. The area also has significant tourist potential (spectacular landscapes).

Central African Republic

- **Gounda-St Floris World Heritage Site and the surrounding Village Safari Hunting Zones (Zones Cynégétiques Villagoises) ZCV** – although this area is currently overwhelmed by conflict, the past history of community conservation successes based on consumptive tourism in the ZCV justifies keeping this area on the list

¹⁰⁶ Vosper, A., Masselink, J. & Maisels, F. (2012) WCS RFO Program: Great ape and human impact monitoring in Okapi Faunal Reserve, Democratic Republic of Congo. Final report to USFWS - GACF Agreement 96200-0-G100. WCS]

¹⁰⁷ Hart JA, Detwiler KM, Gilbert CC, Burrell AS, Fuller JL, et al. (2012) Lesula: A New Species of Cercopithecus Monkey Endemic to the Democratic Republic of Congo and Implications for Conservation of Congo's Central Basin. PLoS ONE 7(9): e44271. doi:10.1371/journal.pone.0044271

of priority zones where interventions could restart if and when security returns to this area. A key feature of this zone is the large population of giant eland.

Cameroon

- **Bouba-Ndjida-Benoué:** Sudanian savanna. Bouba-Njida previously contained >500 savanna elephants, but has potential for recovery. Both have giant eland populations.
- **Mbam et Djerem NP.** Large, mostly intact, area of the biodiversity rich savanna-forest transition ecotone. One of the largest remaining populations of savanna elephants in Central Africa (estimate 800).
- **Mount Oku and Ijim Ridge.** Although not category I-IV PAs the area contains the Oku Floral Sanctuary (*Sanctuaire à flore d'Oku*) and contains the largest extent of, and highest, afro-montane forest in West Africa, the only Alpine bamboo forest and the only Podocarpus forest in West Africa. It also has exceptional floral, herpetological, and bird endemism.

Chad

- **Zakouma NP.** This is Chad's emblematic protected area which was brought back from the brink by >30 yrs of sustained support for protection. Zakouma is the flagship protected area of the Sudanian savanna ecosystem. Conservation efforts in the park (managed by APN under a PPP) receive political support at the highest level. It also has very significant tourist potential.

Equatorial Guinea

- **Pico Grande NP (HP) and Pico Basile NP.** Spectacular forest-covered volcanic landscapes with a large altitudinal range (0 – 3000m) and harbouring important Gulf of Guinea primate endemics. Also globally important beaches for marine turtles. On the WHS Tentative List.

São Tome e Príncipe

- **Obo NP São Tomé and Zona Ecologica Príncipe.** They protect important plant and bird endemics and are vital for watershed protection. They are also landscapes of outstanding scenic interest with good tourist potential. On the WHS Tentative List.

The complete list of KLCs, their special features and current partners, is presented in Table 1 below.

Table 34. Summary of key features of the Central African KLCs

KLCA (countries)	Protected areas	Size (km ²)	Special features of site justifying selection	Multi and bilateral donors and other funders present	Principal international technical partners supporting national PA institutions**
Greater Virunga* (DRC, Ug, Rw)	<ul style="list-style-type: none"> Virunga NP (DRC) WHS in Danger Volcans NP (Rw) Mhahinga NP (Ug) Queen Elizabeth NP (Ug) Bwindi NP (Ug) WHS Semiliki NP (Ug) Ruwenzori NP (Ug) WHS Kibale NP (Ug) Kasyoha-Kitomi FR(Ug) Kalinzu-Maramagambo FR (Ug) Kyumbura WR (Ug) 	c. 13,000	<ul style="list-style-type: none"> Albertine Rift Montane and mid altitude forest, East Sudanese savanna, Wetlands WHS x 3; Entire mountain gorilla population and important chimpanzee populations; Majority of Albertine endemics; Exceptional tourism potential; Protection of vital freshwater fish stocks; Watershed protection; 	<ul style="list-style-type: none"> EU UNESCO Belgium WB/GEF HGBF MF USAID USFWS 	<ul style="list-style-type: none"> ACF WCS WWF AWF ZSL FZS DFGF
TRIDOM/TNS* (Cam, Gab, Co, CAR)	<ul style="list-style-type: none"> Minkébé NP (Gab) Ivindo NP (Gab) Mwagne NP (Gab) Dja WR (Cam) WHS in Danger Nki NP (Cam) BoumbaBek NP (Cam) Lac Lobeke NP (Cam) part of TNS WHS Odzala NP (Co) Nouabalé-Ndoki NP (Co) part of TNS WHS Ntougou-Pikounda NP (Co) Lac Tele CR Dzanga-Ndoki NP (CAR) part of TNS WHS Dzanga SR (CAR) Lopé NP (Gab) WHS (natural and cultural) 	c. 250,000	<ul style="list-style-type: none"> Northwest Congolian Forest, Northeast Congolian Forest, Sangha Aquatic ecoregion, Atlantic Equatorial Coastal Forest WHS X 4; Majority of Central Africa's remaining forest elephants; Majority of Central Africa's lowland gorillas and chimpanzees; Major portion of Congo basin flora; including several endemic plants (eg in Lopé) Important area of Congolian swamp forest (Lac Tele) Endemic sun tailed monkey (Lopé) Hundreds of mineral rich forest clearings (bais) Ancient rock art (Lopé) High tourist potential in several of the PAs – Odzala, TNS, Lopé, Ivindo) Good potential for PPPs with logging and mining sector and with protected area management specialists; 	<ul style="list-style-type: none"> EU USFWS USAID KfW GIZ GEF/PNUD ADB Netherlands 	<ul style="list-style-type: none"> WWF Netherlands WCS AP FTNS
Gamba/Mayumba/ Conkouati* (Gab, Co)	<ul style="list-style-type: none"> Loango NP (Gab) Moukalaba-Doudou NP (Gab) Mayumba NP (Gab) Conkouati NP (Co) 	c. 12,600	<ul style="list-style-type: none"> Atlantic Equatorial Forest, Southern Congolian Savannah Forest mosaic, Equatorial coastal aquatic ecoregion Extensive inland wetlands; Endangered manatee population; Forest elephant and apes; 	<ul style="list-style-type: none"> USFWS 	<ul style="list-style-type: none"> WWF WCS SI

KLCA (countries)	Protected areas	Size (km ²)	Special features of site justifying selection	Multi and bilateral donors and other funders present	Principal international technical partners supporting national PA institutions**
			<ul style="list-style-type: none"> Globally important for marine turtles, whales and dolphins; High tourist potential; Protects regionally important marine fish stocks; Potential for PPP with logging and oil sectors. 		
Garamba/Bili-Uere/Southern/Chinko* (CAR, DRC, SS)	<ul style="list-style-type: none"> Garamba NP (DRC) WHS in Danger Bili-Uere complex of Hunting Domains (DRC) Southern NP (South Sudan) Lantoto NP (South Sudan) Zemongo-Chinko (CAR) 	C. 250,000	<ul style="list-style-type: none"> Northern Congolian forest –savanna mosaic, Sudanian savanna WHS x 1 (Garamba -on list of WHS in Danger) Biodiversity rich forest-savanna mosaic in transition zone linking with vast intact areas of Sudanian savanna. Wildlife reflects this mix of habitats: Chimpanzees, bongo, giant forest hog, forest and savanna elephant, giant eland, roan, hartebeest, wild dog. 	<ul style="list-style-type: none"> USFWS EU World Bank GEF Spain (AECID, MAAMA) Fundacion Biodiversidad Life Web 	<ul style="list-style-type: none"> WCS APN Chinko Project Lukuru Foundation AWF
Gounda-St Floris -Bamingui-Bangoran and surrounding hunting blocks (CAR)	<ul style="list-style-type: none"> Gounda-St Floris NP (WHS in danger) Bamingui-Bangoran NP Zone Pilote de Sangba 	c. 50,000	<ul style="list-style-type: none"> Sudanian savanna WHS in Danger Until recent conflict good CBNRM results from safari hunting in Zone Pilote de Sangba buffer zone 	<ul style="list-style-type: none"> EU 	<ul style="list-style-type: none"> AGRECO
Salonga (DRC)	<ul style="list-style-type: none"> Salonga NP. WHS in Danger 	33,350	<ul style="list-style-type: none"> Eastern Congolian swamp forests, Central Congolian lowland forest WHS in Danger Bonobos, endemic small primates, 	<ul style="list-style-type: none"> EU 	<ul style="list-style-type: none"> WWF
Okapi (DRC)	<ul style="list-style-type: none"> Okapi WR. WHS in Danger 	13,750	<ul style="list-style-type: none"> Northeastern Congolian lowland forest Okapi, forest elephant, chimpanzee, bongo, Congo peacock, Aquatic genet 17 spp of diurnal and nocturnal primates 	<ul style="list-style-type: none"> KfW GIZ UNESCO 	<ul style="list-style-type: none"> WCS GIC
Kahuzi-Biega (DRC)	<ul style="list-style-type: none"> Kahuzi-Biega NP. WHS in Danger 	6,000	<ul style="list-style-type: none"> Northeastern Congolian lowland forest, Albertine Rift Afro montane forests 	<ul style="list-style-type: none"> GIZ/KfW UNESCO 	<ul style="list-style-type: none"> WCS
Maiko-Tayna (DRC)	<ul style="list-style-type: none"> Maiko NP Tayna Community Reserves 	c. 11,000	<ul style="list-style-type: none"> Northeastern Congolian lowland forest Grauer's gorilla (important site for this species given its very heterogeneous distribution in eastern DRC) other endemics including Okapi, Aquatic genet, Congo peacock 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> FZS

KLCA (countries)	Protected areas	Size (km ²)	Special features of site justifying selection	Multi and bilateral donors and other funders present	Principal international technical partners supporting national PA institutions**
Upemba- Kundelungu (DRC)	<ul style="list-style-type: none"> Upemba NP (DRC) Kundelungu NP Zone Annexe (buffer zone) 	17,000	<ul style="list-style-type: none"> Miombo woodland (only protected example in Central African region) Last remaining population of Congo zebra 	<ul style="list-style-type: none"> KfW EU 	<ul style="list-style-type: none"> GFA BAK
Lomako- Yokokala (DRC)	<ul style="list-style-type: none"> Lomako-Yokokala WR 	3,625	<ul style="list-style-type: none"> Central Congolian lowland forests; Eastern Congolian swamp forests Bonobo, elephant, sitatunga etc. 	<ul style="list-style-type: none"> USAID 	<ul style="list-style-type: none"> AWF
Tumba-Lediima (DRC)	<ul style="list-style-type: none"> Tumba-Lediima NR 	7,500	<ul style="list-style-type: none"> Central Congolian lowland forest; Congolian swamp forest Bonobo Together with Lac Tele in Congo this is the largest area of protected Congolian swamp forest Protection of vital freshwater fish stocks 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> WWF
Itombwe-Kabobo (DRC)	<ul style="list-style-type: none"> Itombwe proposed PA Mitsotshi-Kabobo proposed PA Luama Hunting Domain 	c. 10,000	<ul style="list-style-type: none"> Albertine Rift mid altitude forest; Forest savanna transition Chimpanzees – one of the few viable chimp populations in the Albertine Rift Endemic subspecies of Angolan Colobus and red Colobus Albertine bird endemics 	<ul style="list-style-type: none"> USFWS USAID Rainforest Trust Critical Ecosystems Partnership Fund 	<ul style="list-style-type: none"> WWF WCS
Lomami (DRC)	<ul style="list-style-type: none"> Lomami NP (in process of gazettment) 	c. 10,000	<ul style="list-style-type: none"> Central Congolian lowland forests Bonobo, Okapi, Congo peacock, two newly described species of small primate 	<ul style="list-style-type: none"> KfW Abraham Foundation ARCUS 	<ul style="list-style-type: none"> Lukuru Foundation
Bouba-Ndjida- Benoué (Cam)	<ul style="list-style-type: none"> Bouba Ndjida NP Benoué NP 	4,000	<ul style="list-style-type: none"> Northern Congolian forest savanna mosaic; East Sudanian savanna Savannah elephants, savanna ungulates (23 antelope species) including giant eland 	<ul style="list-style-type: none"> France Germany EU 	<ul style="list-style-type: none"> GIZ
Mbam and Djerem (Cam)	<ul style="list-style-type: none"> Mbam and Djerem NP 	4,500	<ul style="list-style-type: none"> Forest savanna transition One of largest remaining savanna elephant populations in Central Africa; Gorillas, chimps, forest savanna ecotone species, 	<ul style="list-style-type: none"> USFWS 	<ul style="list-style-type: none"> WCS
Mt Oku –Ijim Ridge (Cam)	<ul style="list-style-type: none"> Mt Oku –Ijim Ridge 	200	<ul style="list-style-type: none"> Afromontane forest Largest extent of, and highest, afromontane forest in Western Africa, the only Alpine bamboo forest and the only Podocarpus forest in Western Africa. Exceptional floral, herpetological, and bird endemism 		
Zakouma (Chad)	<ul style="list-style-type: none"> Zakouma NP 	23,600	<ul style="list-style-type: none"> A rare example of intact Sudanian savanna ecosystem with viable wildlife populations. 	<ul style="list-style-type: none"> EU 	<ul style="list-style-type: none"> APF

KLCA (countries)	Protected areas	Size (km ²)	Special features of site justifying selection	Multi and bilateral donors and other funders present	Principal international technical partners supporting national PA institutions**
			<ul style="list-style-type: none"> • Good tourism potential 		
Monts de Cristal- Altos Nsork* (Gab, GE)	<ul style="list-style-type: none"> • Monts de Cristal NP • Altos-Nsork NP 	c. 2,500	<ul style="list-style-type: none"> • Atlantic Forests • Pleistocene refuge, with the highest species richness and diversity of any site in western Central Africa • Mandrills, • Vital water catchment area • On WHS tentative list 		
Pico Grande and Pico Basile (EG)	<ul style="list-style-type: none"> • Pico Grande NP • Pico Basile NP 	850	<ul style="list-style-type: none"> • Gulf of Guinea lowland and montane forest • Spectacular forest covered volcanic landscapes with a large altitudinal range (0 – 3000m); • 5 endemic sub species of primate; • Globally important beaches for marine turtles. • On the WHS Tentative List. 		
Obo-Zona Ecologica Principe (STP)	<ul style="list-style-type: none"> • Obo NP (Sao Tome) • Zona Ecologica (Principe) 	300	<ul style="list-style-type: none"> • Gulf of Guinea lowland and montane moist forest • Plant and bird endemics; • Vital for watershed protection. • Landscapes of outstanding scenic interest with high tourist potential; • On the WHS Tentative List. 	<ul style="list-style-type: none"> • EU 	
TOTAL	61	c. 723,775			

* Denotes that the area is also a TFCA

** Many of these technical partners also mobilise their own sources of core funding.

Country abbreviations: CAR – Central African Republic; Cam – Cameroon; Co – Congo Republic; DRC – Democratic Republic of Congo; EG – Equatorial Guinea; Gab - Gabon ; Rw – Rwanda; STP – Sao Tome e Principe; Ug –Uganda.

NB The surface areas quoted are approximate because, unlike PAs, the boundaries of landscapes around and between the PAs are not officially defined.

5.2 ENGAGE WITH THE PRIVATE SECTOR EXTRACTIVE INDUSTRY TO ENHANCE BIODIVERSITY CONSERVATION OUTSIDE PROTECTED AREAS

Since almost all forest outside of protected areas is (or will soon) be attributed to private extractive industry operators, conservationists have to engage with them if we are to preserve connectivity between protected areas and ecological functions across large tracts of forest. Currently the most promising opportunities for this type of collaboration are in the forests of Gabon, northern Congo, and southern Cameroon in the Greater TRIDOM/TNS landscape. Since protected areas cover only 20% of the forest in this zone, the areas attributed as concessions cover the overwhelming majority of the forest, and therefore probably still contain much of the zone's wildlife.

Ideally collaborative agreements should be established between the government forestry/wildlife institutions, the extractive industry concessionaires and conservation organizations with the objective of developing and implementing best practices to avoid wildlife loss as a result of the extractive activities. The exact nature of measures will depend on the particular circumstances of each case but it will be necessary to work on several fronts including wildlife and socio-economic surveys to establish baselines, establishing strong company internal regulations concerning wildlife issues, implementing wildlife surveillance strategies, biodiversity offset mechanisms for "no net loss" of biodiversity, and monitoring conservation outcomes. Working with local communities in the concessions to clarify owner and use rights of forest resources, particularly wildlife, will be a crucial step in the process of managing sustainable hunting of bushmeat species. These measures should be an integral part of a company's management plan which is a legally binding document (see further discussion in following section on tackling the bushmeat issue). The inclusion of adherence to wildlife laws in the matrix of FLEGT legality criteria would further enhance the conservation outcomes in non-FSC forest concessions.

Priority should be given to working with mining and logging companies that are located within the Greater TRIDOM/TNS and Gamba/Mayumba/Conkouati TFCAs (5.1.1).

5.3 TRAINING AND INSTITUTION BUILDING

In Central Africa much important training of wildlife managers (wardens, monitoring officers, community conservation officers, rangers, etc) takes place on site in the form of on-the-job training within the framework of externally funded projects. While the value of this kind of training is undeniable, and has led to the emergence of many highly competent national conservation practitioners, the weakness of the protected area agencies to which they belong (absence of career opportunities, poor management of staff, governance issues) means that many of these individuals end up leaving their institutions for better paid, and more stable and fulfilling jobs with INGOs or international agencies where they have real career opportunities. The other common scenario is that, because of the lack of competent PA authority staff, individuals from outside of the management authorities are brought in to a site and trained, but once trained very few of them are integrated into the national authority (nor do many of them even wish to be integrated).

There is therefore an urgent need for fundamental institutional reform in almost all of the Central African PA authorities. PA management needs to be professionalised and proper career prospects offered for people entering the service. This is such a fundamental change which has to occur that many years of institution building will be required before tangible results will be seen in terms of improved management of PAs. It will also require genuine political will for change (and improved governance) in order to overcome the resistance to change that undoubtedly exists within certain countries of the region. However, as noted in Vol. 3 (5.4.2), institutional reform of PA management authorities is a cost effective conservation investment because all PAs and wildlife stand to benefit.

Three simultaneous lines of action are therefore required:

- Continue with on-the-job training in sites within the framework of externally supported interventions (see 5.1 for more detail). Training should be a standard component of all interventions in support of the sites identified in this report.
- Support the main regional training centers, (EFG, ERAIFT, ENF) in Cameroon, DRC and Gabon respectively in collaboration with their other international partners. This would involve capacity building of the institutions themselves, as well as provision of scholarships for students. Other training centers located in the heart of the moist forest zone, such as the Alphonse Makanga Training Centre in Lopé, could be supported and links strengthened with the above-mentioned regional training centers.
- Support national-level institutional support/reform for national PA authorities in countries demonstrating genuine political commitment to see the reforms through.

5.4 TACKLING THE BUSHMEAT ISSUE

Over-exploitation of wildlife threatens food security and wildlife. It is recognized as a global concern by the Convention on Biological Diversity¹⁰⁸ which has established a Liaison Group on Bushmeat to work with the CITES Central Africa Bushmeat Working Group. In Central Africa demand for bushmeat is higher than the sustainable level of production. One of the most important root causes of overhunting is the breakdown in traditional controls over access to land and hunting areas, and the fact that legal frameworks of the Central African nations do not recognize local control over traditional lands and the rights of local populations to manage or regulate hunting on these lands¹⁰⁹. As a result traditional rules over hunting have broken down and in many areas there is now a situation of open access with little or no control by local communities over hunting by outsiders. Faced with the scale of bushmeat hunting and the evident impoverishment of large areas of forest in Central Africa conservationists have tended to favor a law enforcement approach to prevent irreversible impoverishment of the forests. Development-orientated actors suggest that a regulated bushmeat trade, which maintains the supplies of appropriate species from forests, can contribute to economic growth in areas where there are few other options, but conservationists argue strongly that sustainable offtake can only be achieved where human populations do not exceed about 1 inhabitant/km² and where the meat is consumed at home (ie not sold outside the area)¹¹⁰. This is an increasingly rare situation in Central Africa and as long as rural populations remain poor and the demand for bushmeat in urban markets remains high an unsustainable trade in bushmeat will continue to exist. Establishing a regulated and sustainable system of harvesting bushmeat will therefore be extremely complex and time consuming to achieve given the fundamental changes to legal frameworks that must occur across Central Africa and the scale of capacity building of local communities for wildlife management that will be necessary. **The legitimate fear of conservationists is that by the time the regulatory frameworks are in place and capacities of local communities for sustainable wildlife management have been built, most of the wildlife will already have disappeared from the forests outside of protected areas.** Law enforcement will therefore remain a necessary activity running in parallel with pilot schemes to test and develop models for the regulated participatory management of bushmeat harvesting.

¹⁰⁸ CBD Decision XI/25 on "Sustainable use of biodiversity: bushmeat and sustainable wildlife management" <https://www.cbd.int/decision/cop/default.shtml?id=13186>.

¹⁰⁹ Sustainable Management of the Wildlife and Bushmeat Sector in Central Africa. FAO/GEF project document 2010. 99pp.

¹¹⁰ Robinson JG, and Bennett EL. 2000. Hunting for sustainability. New York: Columbia University Press

Bushmeat is a food security issue in rural environments whereas in urban areas this is not necessarily the case. The protein gap therefore needs to be tackled in rural areas by combinations of various actions at different points of the value chain and of the enabling environment. Three strategic approaches are therefore necessary: (i) reducing the demand for bushmeat; (ii) improving the sustainability of the supply by better management of the resource and (iii) creating a conducive and enabling institutional and policy environment. **The ultimate goal should be to achieve sustainable harvesting of bushmeat for local consumption in rural areas, and eliminate bushmeat consumption in urban areas.**

5.4.1 Reduce the demand for bushmeat

Hunters and rural consumers:

- Develop alternative sources of protein at a cost similar to bushmeat. With an estimated yearly extraction rate in the Congo basin of 4.5 million tons of bushmeat cattle ranching is never going to be an ecologically sustainable solution since an estimated 25 million hectares of forest would have to be converted to pastures¹¹¹. Pigs and chickens have much higher conversion rates than do cattle and both can thrive on kitchen scraps and crop residues. Near Ouesso, one of the region's biggest bushmeat markets, opportunities exist for producing chicken feed locally (from soya and maïs) at a price below bushmeat¹¹². Developing sustainable fisheries in the rivers and lakes should also be investigated as fish are so important in local diets and can be a substitute for bushmeat. However, as noted in 4.10, attempts to develop alternatives for bushmeat have so far had limited success in Central Africa. Requiring extractive industry concessionaires to import domestically produced meat for their workers should also be a standard requirement.
- Improve economic opportunities in productive sectors. This will cover a wide range of possibilities depending on the local context.
- Raise awareness through environmental education and awareness building through local media using the INCEF-type approach.

Retailers and urban consumers:

- Strictly enforce the ban on the sale and consumption of protected and endangered species. Protected species found on sale should be publicly destroyed.

International consumers:

- The international trade must be completely stopped. Heavy fines should be levied for possession or trade of bushmeat regardless of the status of and provenance of the species.
- A concerted effort is needed to raise awareness among personnel stationed at exit points (ports, airports, border posts)
- Airline and shipping companies should commit to banning the transport of all bushmeat (regardless of its status) and should be made accountable for enforcing this. Regardless of the issue of sustainability, the international trade in bushmeat constitutes a serious public health risk.

¹¹¹ R. Nasi, A. Taber and N. Van Vliet. 2011. Empty forest, empty stomachs ? Bushmeat and livelihoods in Congo and the Amazon basin. *International Forestry Review*, vol 13.

¹¹² Pers. Comm. with WCS representatives

5.4.2 Improve the sustainability of the supply by better management of the resource

This will require developing models of wildlife management with local communities, research and extension, and engagement with the extractive industries.

Hunters and rural consumers:

- Work with hunters and rural communities to establish hunting rules which allow harvesting of resilient species but ban hunting of vulnerable species. This process will involve participatory land-use planning at the local community level and should lead to the definition of hunting rules (period, location, hunting tools, quotas, etc.), and simple methods to self-monitor their activities. This will be a highly complex undertaking requiring adequate financial and technical resources. Lessons learned from past experiences in the region (e.g. PROGEPP) should be drawn on rather than trying to “reinvent the wheel”.

Research and extension services:

- Understanding the dynamics of hunting and its impact on the dynamics of heavily hunted resilient species and their more vulnerable competitors is highly complex and will require a concerted effort in terms of research and monitoring by appropriate research bodies. The SYVBAC program¹¹³, established by TRAFFIC, is one such monitoring initiative.
- Analyzing the relationships and trade-offs between bushmeat and other protein sources is also a key component of improving the sustainability of the supply. Rural communities will usually switch from bushmeat to fish as the price or availability fluctuates with the seasons. However a decline in one resource can lead to overharvesting of the other so understanding the feedback loop between fish and meat catches is essential. Understanding the factors determining when and under what circumstances consumers will transition to domestic meat is also key to achieving sustainability of bushmeat supply.

Extractive industries

The extractive industries dominate the forest landscape and have considerable potential to influence how the bushmeat “crisis” will evolve. Current legislation in most of the Central African countries requires conservation to be integrated into their sustainable forest management plans, for example the setting aside of no logging “conservation series”, and they have the responsibility to ensure that their personnel respect wildlife legislation. However companies should go further in a number of ways:

- Internal regulations and codes of conduct concerning wildlife in the concessions should become part of the companies’ standard operating procedures. Transportation of bushmeat should be strictly forbidden on company vehicles and manned check-point with trained personnel should be established on the main logging roads in the concessions.
- Companies should be required to provide alternative sources of protein for their workers at cost.
- Companies, in collaboration with experienced technical partners, should organize and support community hunting schemes for communities living within their concessions.
- Companies should subscribe to certification schemes which will give them preferential access to environmentally sensitive international markets prepared to pay a premium for sustainably sourced timber from concessions where wildlife regulations are respected. The same principle applies for the mining concessions.

5.4.3 Create a conducive and enabling institutional and policy environment.

For participatory wildlife management to become a reality national policies, laws and regulations must be able to grant to communities the rights to the land and wildlife that they will manage, and allow community members to market locally the bushmeat and other wildlife products (from permitted species) that are harvested. These provisions are not yet firmly integrated in the policy and legal frameworks of the Central African countries. Several countries are however developing policies or strategies for wildlife management (CAR, DRC, Gabon, Congo) and only one country (Congo) makes very general provisions in its wildlife law for participatory wildlife management (but which cannot be rendered operational until the ministerial regulations are passed). None of the legal frameworks clearly allow the marketing of bushmeat from community-managed lands and the general perception is that the bushmeat market chain is illegal. The distinction between sale for local consumption and trade further afield remains very blurred and is a source of recurring conflict.

Action will be required at several levels:

¹¹³ SYVBAC: SYstème de suivi de la filière Viande de brousse en Afrique Centrale.

National policy making

- Policies, laws and regulations will need to be revised in order to provide an adequate legal framework for enhancing ownership and tenure rights and allowing participatory wildlife management.
- At the same time it will be necessary to legitimize the bushmeat debate in order to properly address the fraught question of the legality of the bushmeat market chain, and acknowledge the contribution of bushmeat to food security in national strategies.

International policies

- Companies or individuals not complying with CITES regulations must be firmly punished and denounced (“name and shame”).
- Wildlife issues must be systematically covered within internationally-supported policy processes.
- A clear link must be made between the international bushmeat trade and emerging disease risks.

Local institutions

- Once the policy and regulatory frameworks are in place, local institutions that have a vested interest in protecting their wildlife resource should be supported and capacities strengthened for managing and monitoring a sustainable local trade in bushmeat.

Finally it should be reiterated that in urban areas, where the great majority of bushmeat is consumed, bushmeat is generally not a food security issue. A bushmeat strategy for the region should therefore concentrate on achieving sustainable off take in rural areas but should not try to “develop” or manage the bushmeat chain in urban areas. **Ultimately the aim should be to see the bushmeat trade in urban areas disappear** by squeezing the transport lines to the urban markets by controlling the major accesses (roads, rivers, railways, and airlines). Dissuasive penalties for transporting bushmeat on trains, internal airlines, public and private transport (logging trucks, buses, boats) would require strong political will but could significantly reduce the volume of trade to the cities.

Since there are no “silver bullet” solutions to the bushmeat problem it is recommended that a series of pilot projects be established in the countries in order to test different approaches in the range of contexts across the region. These pilot projects should build on lessons learned from other ongoing initiatives of this type and should be replicated as and where feasible.

Ideally pilot projects should comprise as many of the following components as possible:

- Be conducted in an area contiguous with a PA that is receiving long term support from the EU (or other agency). This would be part of the PAs community conservation/livelihoods programme;
- Be conducted in collaboration with a private sector partner (e.g. in Central Africa with an FSC certified logging company) as part of its community development obligations;
- Include, or be associated with, a component for developing alternative domestic animal protein at a competitive price (e.g. intensive chicken production where chicken feed can be produced locally without involving habitat loss);
- Include, or be associated with, a scheme to develop sustainable harvesting of freshwater fish (either wild caught or fish farming);
- A strong research and monitoring component, ideally in association with an experienced research organisation – sustainable harvesting of wildlife, particularly in the forest ecosystem, is still a very inexact science.
- A strong community relations component for awareness building and local governance structures.

Associating private sector, PA management and research partners in the work with the local communities would bring important added value in terms of scientific method, local governance building, law enforcement and awareness building.

5.5 DISMANTLING WILDLIFE CRIME NETWORKS AND CURBING THE DEMAND

This aspect is treated fully in the supplementary report on the Wildlife Trade. The recommendations of that report are entirely relevant to the Central African context.

There has been a concerted effort over the past year to translate the 10 point Action Plan of the Marrakech declaration into concrete actions in the Central African region. The Marrakech plan proposes a series of actions around three key themes: (i) building collaboration between organizations and agencies; (ii) strengthening law enforcement; (iii) properly penalizing wildlife crime. Central Africa's response has been to adopt a regional action plan entitled PAPECALF (Action Plan for the COMIFAC

sub region for strengthening the enforcement of national wildlife laws) and to initiate a process leading towards the establishment of National Coordinating Units for fighting wildlife crime. These NCUs will bring together all the arms of government concerned by wildlife crime (Justice, Interior, Defense (Police, Criminal Police, INTERPOL), Finance (Customs), Wildlife), as well as the NGOs involved in wildlife enforcement, such as the EAGLE network and WWF. The presence of NGO WENs (Wildlife Enforcement Networks) is essential in order to guarantee full transparency. Representatives of Diplomatic missions should also be involved in the NCU.

Because the NCUs will bring together so many government departments it is proposed that they should work directly under the Office of the Prime Minister. The mission of the NCUs will be to:

- Establish a mechanism for collecting, storing and sharing information on wildlife crime;
- Build awareness about wildlife criminality among stakeholders and disseminate information on wildlife laws;
- Strengthen capacities of actors involved in combating wildlife crime;

In addition to supporting the process of establishment of effective wildlife crime NCUs, support from the EU should also include:

- **Continued support for international trade regulation** through support for the CITES core functions and expansion of the International Consortium on Combatting Wildlife Crime (ICCWC). The ICCWC is a collaborative effort of five inter-governmental organizations: CITES, INTERPOL United Nations Office on Drugs and Crime, World Bank and the World Customs Organisation which works to bring coordinated support to the national wildlife law enforcement agencies, as well as to the sub-regional and regional networks, that are fighting wildlife crime on a daily basis. The aim is to ensure better coordinated responses to wildlife crime to increase the risk of detection and punishment for wildlife criminals. UNDOC is currently aiding Gabon to develop a plan for improving criminal investigations for wildlife crime and establishing forensic investigation capacities. This kind of initiative should be supported and expanded.
- **Support for the EAGLE network of NGO wildlife law enforcement organizations.** Given the problems of governance and capacities in the sub region the EU should support the EAGLE network. These NGOs, run by highly motivated national and international staff, have demonstrated over the past 5 years their effectiveness and efficiency (they work with very modest budgets). They work well with national law enforcement agencies and make an important contribution to strengthening their capacities. They also help to ensure greater transparency, and wide media coverage of wildlife crime operations.
- The mobilization of specialist international **Wildlife Security Advisors** (Vol. 6, 3.9.3.3) in support of the NCUs. Dismantling wildlife crime networks requires specialist skills that are rarely available in the region.

APPENDICES

APPENDIX 1. THE CONGO BASIN FOREST PARTNERSHIP (CBFP)

The partnership brings together the 10 member states of the COMIFAC, donor agencies, NGOs, scientific institutions and private sector representatives. It currently has 48 members who share the commitment to enhance communication and coordination among the members and to create synergies between their respective projects, programs and policies, in support of the COMIFAC Convergence Plan.

Governments

Belgium, Burundi, Cameroon, Canada, Central African Republic, Chad, Democratic Republic of Congo, Equatorial Guinea, European Commission, France, Gabon, Germany, Japan, Netherlands, Republic of Rwanda, São Tomé and Príncipe, South Africa, Spain, United Kingdom, United States of America.

International Organizations:

African Development Bank, COMIFAC, FAO, Global Mechanism of the United Nations Convention to Combat Desertification, GRASP (Great Apes Survival Partnership), International Tropical Timber Organisation, Secretariat of the Convention on Biological Diversity, Secretariat of the Convention on Migratory Species, UNDP, UNEP, UNESCO, World Bank.

NGOs and research groups:

African Wildlife Foundation, Centre for International Forestry Research (CIFOR), CUSCO International, Conservation International, Forest Trends, IUCN, Jane Goodall Institute, Last Great Ape Organisation, *Réseau Africain de Forêts Modèles* (RAFAM), The Nature Conservancy, Wildlife Conservation Society (WCS), World Resources Institute (WRI), WWF International.

Private sector:

American Forest and Paper Organisation, Inter-African Association of Forest Industries (IFIA), International Technical Association for Tropical Timber (ATIBT), Society of American Foresters

source: <http://www.cbfp.org>

APPENDIX 2. LIST OF NONGOVERNMENTAL FUNDERS AND TECHNICAL PARTNERS ACTIVE IN CENTRAL AFRICA

The major NGOs implementing conservation activities in Central Africa are (in alphabetical order):

- **African Parks Foundation** <http://www.african-parks.org/> - promotes a business approach to conservation through PPP agreements. Manages Zakouma NP (Chad), Odzala NP (Congo), Garamba NP (DRC).
- **African Wildlife Foundation** <http://www.awf.org/where-we-work> - active in DRC and Cameroon. Focuses on areas of great ape importance, including Maringa-Lopori-Wamba landscape in DRC, a key area for bonobos, where they support conservation, research and livelihood initiatives. Their innovative Congo shipping project enables farmers in this remote bonobo area to access markets for their produce.
- **Conservation International**: <http://www.conservation.org>. Supports community based natural resource management initiatives in the Maiko-Tayna-Kahuzi-Biega landscape which encompasses the Grauer gorilla range. Also active in Equatorial Guinea. Part of the Critical Ecosystem Partnership Fund <http://www.cepf.net/Pages/default.aspx>
- **Frankfurt Zoological Society**: <https://www.fzs.org/en/projects-2/current-projects/> Currently supports park management activities in Virunga NP and Maiko NP. Until end 2013 also active in Upemba NP.
- **Fauna and Flora International**: <http://www.fauna-flora.org/> A founding member of the International Gorilla conservation Programme. Supports conservation of two subspecies of lowland gorilla in Cameroon, and various conservation activities in World Heritage Sites in DRC. Helped ICCN develop its community conservation strategy.
- **International Gorilla Conservation Programme**: <http://www.igcp.org> A consortium of AWF, FFI and WWF in partnership with the protected area authorities of DRC, Rwanda and Uganda for the protection of the mountain gorilla population and sustainable livelihood development. Active since 1991,
- **IUCN West and Central Africa**: <http://www.iucn.org> Involved in developing and implementing protected area management tools, World Heritage and Ramsar site evaluations, capacity building of civil society.
- **Jane Goodall Institute**: <http://www.janegoodall.org/> Active in eastern DRC and south west Congo (Tchimpounga Chimpanzee rehabilitation centre). Developed a great ape action plan for eastern DRC.
- **Lukuru Foundation**: <http://www.lukuru.org> Operates in DRC focusing on research and conservation of bonobos in Lukuru and Lomami. Also conducts research in the Bili-Uere forest-savanna transition zone of north DRC.
- **Les Amis du Bonobo du Congo**: <http://www.lolayabonobo.org/> Manages a sanctuary for confiscated bonobos in Kinshasa and releases them back to the wild. Has a highly effective public awareness and education program.
- **TRAFFIC**: <http://www.traffic.org/overview/> The wildlife trade monitoring network, known as TRAFFIC, is the leading non-governmental organization working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development. It investigates and analyses wildlife trade and trends, informs and supports government and inter-government cooperation to adopt, implement and enforce effective wildlife policies and laws, and provides information and advice to the private sector to ensure that sourcing of wildlife uses sustainability standards and best practice.
- **Virunga Foundation**: <http://acfvirunga.org/> Manages Virunga NP under a PPP agreement with ICCN. Although the conflict in this region makes law enforcement a dominating theme, tourism development (particularly mountain gorillas and volcanos) remains highly relevant and innovative livelihood initiatives to address the domestic energy requirements have also been developed (micro-hydroelectric plants, energy efficient stoves and fuel). Education and health are also important sectors supported by the park. See also <http://www.virunga.org>
- **White Oak Conservation Centre (Gilman Conservation International)**: <http://wildlifeconservationglobal.org/> Active in the Okapi Wildlife Reserve (DRC) through its Okapi Conservation Project since 1987 where it has provided substantial and uninterrupted support for okapi conservation, general reserve management and livelihoods and education initiatives.
- **Wildlife Conservation Society**: <http://www.wcs.org/where-we-work/africa.aspx> - active in all countries of the forested Central African region at the landscape and species levels (great apes, forest elephant, marine mammals, etc). Deeply involved in park management, capacity building, and conservation oriented research and monitoring. Has been one of the leading organisation developing and promoting methodologies for monitoring and research in forested environments. A major player in the Central African conservation landscape.
- **World Wide Fund for Nature**: http://wwf.panda.org/who_we_are/wwf_offices/cameroon/

Active at the landscape and species levels (great apes, elephant). WWF is involved in protected area management, policy development, capacity building, community forests, and fighting wildlife criminality. It is a major player in the Central African conservation landscape.

- **Zoological Society of London:** <http://www.zsl.org/about-us/> - Active in DRC, Cameroon, Gabon and Equatorial Guinea. Undertakes research on the bushmeat issue and tests livelihood alternatives. Also works on single species conservation initiatives (Okapi, mountain and lowland gorillas).
- **Zoological Society of Milwaukee:** Active in Salonga NP, DRC for the past 30 years. Focuses on bonobo research, monitoring, training and support for anti-poaching, and education and adult literacy.

Other private Organisations supporting conservation activities include:

- **ARCUS Foundation:** www.arcusfoundation.org An important funder for projects targeting Central Africa's 3 great apes through numerous grants to conservation NGOs.
- **Abraham Foundation:** <http://abrahamfoundation.org/>. Supports conservation NGOs implementing conservation activities in DRC and Cameroon focusing on elephants, and great apes. The annual Abraham Awards are given to Congolese field conservationists who have made an outstanding contribution to conservation. In recent years many of the awards have had to be made posthumously to the families of guards who have lost their lives in the line of duty.
- **Aspinall Foundation:** <http://www.aspinallfoundation.org/> Rehabilitation of gorillas in gallery forests of two protected areas on the Batéké plateau in Gabon and Congo, and support for management of the two parks.
- **Ape Alliance:** <http://www.4apes.com/> Supports initiatives for Grauer gorillas (Kahuzi-Biega), Bonobos (Lukuru) and Chimpanzees (Tchimpounga Rehabilitation centre).
- **Berggorilla & Regenwald Direkthilfe:** <http://www.berggorilla.de/> A German-based NGO focusing on fundraising and lobbying for gorilla conservation.
- **Biodiversité au Katanga:** <http://www.bakasbl.org/> A Congolese NGO dedicated to biodiversity conservation in the Province of Katanga, southern DRC, through research and education.
- **BirdLife International:** <http://www.birdlife.org/> The world's largest nature conservation partnership with 13 million members and 120 partner organizations worldwide. Gathers information and monitors Important Bird Areas (IBA) and supports conservation initiatives throughout Central Africa through its network of partners and volunteers.
- **Bonobo Conservation Initiative:** – <http://www.bonobo.org/> Works in several protected areas of the bonobo range in DRC and implements education and sustainable development initiatives.
- **Born Free Foundation:** <http://www.bornfree.org.uk/> Supports chimpanzee sanctuaries in DRC and Cameroon, and supports Kahuzi-Biega NP in DRC, and LAGA's activities in Cameroon.
- **Dian Fossey Gorilla Fund International:** <http://gorillafund.org/page.aspx?pid=407>. Dedicated to the conservation and protection of gorillas and their habitats through research, support for protection, and community conservation activities.
- **Howard G. Buffet Foundation:** <http://www.thehowardgbuffettfoundation.org/>. Through its Africa Great Lakes Peace Initiative it supports conservation, agriculture and economic development (100m\$ mobilised from 1999-2014). Currently supports livelihood initiatives in buffer zone of Virunga NP.
- **International Fund for Animal Welfare:** <http://www.ifaw.org/> A highly effective pressure group combating international wildlife crime through political advocacy and support to conservation and law enforcement activities on the ground, with a particular focus on elephants.
- **International Conservation and Education Fund:** <http://www.incef.org/> Focuses on locally produced and disseminated videos as an educational tool to foster improvement of the health and well-being of human and wildlife populations. It does this by building capacities of local media professionals to produce quality films in local languages and building capacities among local education teams to disseminate the videos and measure their impacts.
- **International Primate Protection League:** <http://www.ippl.org/gibbon/> Supports primate initiatives in Bioko (Equatorial guinea), Cameroon (LAGA) and Congo (chimpanzee rehabilitation)
- **Liz Claybourne and Art Ortenberg Foundation:** – <http://www.lcaof.org/> Focuses on elephant conservation and support for park and buffer zone management. Has been a major donor to WCS in Central Africa.
- **Margot Marsh Biodiversity Foundation:** Provides small grants to a variety of primate conservation activities in Central Africa

- **McArthur Foundation:** <http://www.macfound.org/> Supports a wide variety of conservation actions (surveys, capacity building, park management, education) through small grants to individuals and NGOs. Part of the Critical Ecosystem Partnership Fund.
- **Mohammed bin Zayed Species Conservation Fund:** <http://www.speciesconservation.org/> Support for bonobo conservation in Tchuapa-Lomami-Lualaba
- **Murray Foundation:** <http://www.themurryfoundation.com> The foundation's activities include: constructing and maintaining schools for orphaned children, ensuring animal welfare, rehabilitation and release sanctuaries for endangered animals, supporting AIDS/HIV projects, and land acquisition for projects
- **Prince Bernhard Nature Fund:** <http://www.pbnf.nl/> Supports small local initiatives towards the conservation and wise use of natural resources. The Fund aims to help save critically endangered flora and fauna.
- **Rufford Foundation:** <http://www.rufford.org> A UK based charity making numerous small grants for a wide range of nature conservation and sustainable livelihood projects. Funds projects throughout Central Africa.
- **The Thin Green Line Foundation:** <http://www.thingreenline.org.au/> Focuses on supporting rangers with training, equipment and other resources in high biodiversity value conflict zones. Provides support for the widows and children of fallen rangers.

Universities, international research organisations active in Central Africa include:

- **Centre for International Forestry Research (CIFOR):** <http://www.cifor.org/> Research themes cover climate change, smallholder and community forests, conservation and development trade-offs, globalised trade and investment, and production forests.
- **Environmental Investigation Agency (EIA):** <http://www.eia-international.org/> An independent campaigning organisation committed to protecting the natural world from environmental crime and abuse. Areas of expertise are ecosystems and biodiversity, environmental crime and governance, climate change.
- **French Agricultural Research Centre for International Development (CIRAD):** <http://www.cirad.fr/en> Research themes include biodiversity and development, alleviating food insecurity, sustainable management of forest ecosystems, monitoring the emergence of agro-industrial plantations, animal disease epidemiology.
- **International Tropical Timber Organization (ITTO):** <http://www.itto.int/> An intergovernmental organization promoting the conservation and sustainable management of tropical forests.
- **Joint Research Centre (JRC):** <http://ec.europa.eu/dgs/jrc/> The EU's JRC oversees the implementation of the BIOPAMA and OFAC projects and supports local organisations through capacity building, provision of mapping and other data.
- **Kyoto University:** <http://www.kyoto-u.ac.jp/en> Undertakes research on great apes in DRC and Gabon
- **Max Planck Institute for Evolutionary Anthropology:** <http://www.eva.mpg.de/> Focuses on gorilla and bonobo research and conservation in CAR, Gabon, DRC, Rwanda and Uganda. Developed and houses the IUCN/A.P.E.S. great apes data base and mapper.
- **Rainforest Foundation UK:** <http://www.rainforestfoundationuk.org/index> Supports indigenous forest peoples in their efforts to protect their environment and fulfil their rights to land and sustainable livelihoods. Has produced many excellent analyses on forest related issues (climate change, indigenous peoples, conservation, law and policy, rights and livelihoods).
- **South Dakota State University (SDSU):** Monitoring of forest cover change in the Congo Basin, particularly in and around protected areas, and training. A partner in the Central African Forest Observatory (OFAC).
- **University of Stirling,:** Involved in primate research for many years.
- **University of Maryland:** A partner of OFAC doing forest cover mapping and analyses, and training.
- **Université Catholique de Louvain, Belgium:** A partner of OFAC doing forest cover changes and analyses, and training.
- **World Resources Institute:** <http://www.wri.org/> Forest Mapping of the Congo Basin. Has produced Forest Atlases of each of the rainforest countries of Central Africa.
- **World Agroforestry Centre (ICRAF):** <http://www.cgiar.org/> A consortium of 15 research organisations working on a wide range of agroforestry and sustainable agriculture issues.
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